

ORIGINAL PAPER

No. 1216

Laid upon the Table

30 | 11 | 89

NORTHERN TERRITORY OF AUSTRALIA

SESSIONAL COMMITTEE ON THE
ENVIRONMENT

REPORT

NOVEMBER 1989

CONTENTS

	Page No.
INTRODUCTION	1
TERMS OF REFERENCE	1
COMMITTEE'S ROLE	2
MEETINGS	3
VISIT TO LUCAS HEIGHTS AND ROXBY DOWNS	3
MATTERS BROUGHT TO THE ATTENTION OF THE COMMITTEE	8
Release of Water from RP4	8
Conclusion	9
GENERAL ENVIRONMENT	11
MONITORING AGENCIES	11
Alligator Rivers Region Unit	
of Department of Mines and Energy	12
Office of the Supervising Scientist	13
Location of OSS Office	14
The Supervisory and Assessment Branch	15
The Research Institute	15
SUMMARY	20

REPORT ON COMMITTEE'S ACTIVITIES

INTRODUCTION

On 28 April 1987 the Sessional Committee on the Environment was reappointed with the following membership:

Mr Bell;
Mr McCarthy;
Mr Poole;
Mr Reed; and
Mr Tipiloura.

On 7 May 1987, Mr McCarthy was discharged from further attendance on the Committee, and Mr Dondas was appointed in his place. At its meeting on 9 June 1987, Mr Dondas was elected Chairman.

Further changes in membership of the Committee occurred on 17 May 1988 with Mr Poole being discharged from the Committee and Mr Firmin appointed in his place. On 16 August 1988, Mr Reed was also discharged from further attendance on the Committee and Mr Hatton was appointed in his place.

On 10 October 1989, Mr Dondas and Mr Hatton were discharged from further attendance on the Committee and Mr Poole and Mr Palmer were appointed in their places.

At a meeting of the Committee on 17 October 1989, Mr Firmin was elected Chairman. The Membership of this Committee now comprises:

Mr Firmin (Chairman);
Mr Bell;
Mr Palmer;
Mr Poole; and
Mr Tipiloura.

TERMS OF REFERENCE

Your Committee has been charged to -
"inquire into and from time to time report upon and make recommendations on:

- (a) all matters relating to uranium mining and processing activities and their effects on the environment within the Alligator Rivers Region; and
- (b) any matter relating to mining and/or the environment within the Northern Territory which is referred to it by -
 - (i) the relevant Minister; or
 - (ii) resolution of the Legislative Assembly."

Your Committee has also been authorized -

- (a) "to send for persons, papers and records, to sit in public or in private session notwithstanding any adjournment of the Assembly, to adjourn from place to place and have leave to report from time to time its proceedings and the evidence taken and make such interim recommendations as it may deem fit, and to publish information pertaining to its activities from time to time;
- (b) to publish from day to day such papers and evidence as may be ordered by it, and, unless otherwise ordered by the Committee, a daily Hansard be published of such proceedings as take place in public; and
- (c) to consider the Minutes of Proceedings, evidence taken and records of similar Committees appointed in previous Assemblies.

COMMITTEE'S ROLE

During the year, no specific references on mining or the environment were given to the Committee. Thus the Committee's role was one of monitoring and watching over the various government and non-government agencies participating in the mining and monitoring of uranium in the Alligator Rivers Region with specific emphasis on any impact this has on the environment.

Your Committee, accepting that mining has been authorised to take place in this Region, is concerned that it is done in an orderly and safe manner and that the mineral resources are recovered in a way which ensures, by all means possible, that mining causes no deleterious effects on the environment.

MEETINGS

The committee held three formal meetings during the year.

VISIT TO LUCAS HEIGHTS AND ROXBY DOWNS (OLYMPIC DAM)

On 2 March 1988 your Committee resolved to visit Roxby Downs in South Australia and Lucas Heights (ANSTO [the Australian Nuclear Science and Technology Organisation]) and the Office of the Supervising Scientist in New South Wales. These inspections were undertaken in August 1988. The Committee was also briefed by officers of the South Australian Department of Mines and Energy.

The purpose of the visits was to inform the Committee of procedures operating elsewhere in Australia relating to uranium mining, processing activities and environment issues. The Committee was also aware of projects being undertaken by ANSTO which were of direct relevance to the Alligator Rivers Region.

Prior to the Committee's departure the Northern Territory Department of Mines and Energy provided briefing papers on the operations of ANSTO and Roxby Downs (Appendices A and B).

1. 8 August 1988 - Lucas Heights

On arrival your Committee was met by Dr Terence Watson and was given an extensive briefing on ANSTO operations. Other

officers in attendance were:

Dr David Cook - Executive Director
Dr Bob Smith - Deputy Director
Dr Pat Kelly - General Manager (Research)
Mr John Rolland - Director, Technical Secretariat.

Your Committee was then taken on an inspection of the establishment and briefed accordingly. The major matters involved in this inspection were:

- . High (Neutron) Flux Australian Reactor (HIFAR)
- . Australian Radioisotopes - medical radioisotope production area
- . Gamma radiation pond - food irradiation research
- . Waste Management Facilities
- . SYNROC Project

After observing the facilities, the following discussions and briefings were conducted:

- . Environmental Science (Mr Des Dany, Director Environmental Science)
- . Alligator Rivers Analogue Project - applications of radioisotopes and radiation (Dr Clarence Hardy, Director)
- . SYNROC Project (Dr Adam Jostsons, Director Advanced Material)
- . Enrichment technologies (Dr Doug Ebeling, Director Special Projects).

2. 10 August 1988 - Office of Supervising Scientist

Your Committee was met by the Supervising Scientist, (Mr Fry), who briefed Members on OSS operations to date.

Discussions were also held with the following officers: Dr Peter Bridgewater (Environment Protection); Mr Bob Pegler (Conservation Division); Mr Mick Carter (Health Physicist); and Mr Phillip Greenwood (Policy and Executive).

Discussion topics covered were:

1. OSS role and functions in Alligator Rivers Region - Overview.
 2. OSS operations related to Ranger water and tailings management and rehabilitation (including revegetation) studies and trials, including:
 - . OSS/ANSTO environmental research and monitoring studies related to:
 - flora and fauna; and
 - radon/radon daughter measurements
 - . OSS involvement in vegetation and rehabilitation trials at Ranger, Nabarlek and Rum Jungle.
 3. Nabarlek operation - future operation.
 4. Conservation Zone/Coronation Hill activities.
 5. OSS role and/or involvement in nuclear fuel cycle activities such as transport, radioactive materials and waste disposal.
 - . Development of nuclear codes of practice and guidelines.
3. Department of Mines, South Australia, 11 August 1988

Your Committee discussed and was briefed on the following major topics:

- . The supervising/overseeing/monitoring role of the South Australian Department of Mines and Energy (SADME) with respect to Olympic Dam, compared to other mining operations in the State, with emphasis on Environment Protection.

- . The role SADME has in the nuclear fuel cycle;
 - transportation of radioactive materials;
 - nuclear fuel cycle waste disposal; and
 - security/safeguards in accounting for uranium.

- . An outline of the working/administration of the indentured agreement containing the environmental assessment and monitoring approved by the South Australia Parliament.

- . Commonwealth involvement in the Olympic Dam project.

- . The role SADME plays in environmental regulation and monitoring at the Olympic Dam site, in particular with respect to:
 - project area environmental monitoring;
 - radiation levels naturally occurring in environment;
 - radiation exposure/impact on employees in key areas of the mine;
 - other occupational exposures in the mine such as;
 - (a) noise;
 - (b) dust; and
 - (c) gases;
 - administrative arrangements with other Government Departments involved in the project; and
 - medical records relevant to occupational health.

A resume of discussion topics and answers provided are at Appendices A, B and C.

4. Olympic Dam, 12 August 1988

This was the first time that the Committee had visited Olympic Dam. Members were met by the Manager Bob Crew, and received a briefing which covered three main topics:

- . environmental monitoring: the briefing was given by Mr B Middleton, Environmental Superintendent;
- . radiation monitoring: the briefing was given by Mr Mark Santer, Radiation and Safety Superintendent; and
- . groundwater monitoring: the briefing was given by Mr N Brabham.

Issues discussed also included: possible pollution of groundwater, possible pollution/contamination of sub-aerial springs, controls, sampling methods, analysis, sample timing, supplementary sampling and reporting of results.

The inspection covered the metallurgical plant, laboratories, and underground mining area. On return from the site visit, officials and Members participated in an extensive question and answer session.

Following the briefings an extensive tour of the project area was conducted.

MATTERS BROUGHT TO THE ATTENTION OF THE COMMITTEE

During the year 1988/89 a number of matters were brought to the attention of the Committee. the following is a summary of certain of those matters and Committee action thereon.

Release of Water from Retention Pond No. 4 (RP4)

The Committee was made aware of a release of water on 22 February 1989 from RP4 at Ranger Uranium Mine. Since the Assembly was sitting at this time, questions were raised in the Assembly as to the appropriateness of such releases. Various other organisations which had an interest in the Region issued conflicting press statements as to the necessity for such releases and raised the concern that possible damage to the environment had taken place.

The Chairman sought a report on this release from the Alligator Rivers Research Unit.

All Members received a copy of the report on approximately 29 March 1989, and it is included in full as Appendix C.

At a subsequent Committee meeting, on 18 May 1989, it was resolved - That:

- (a) the Committee investigate the RP4 water release during its visit to the Uranium Province on 29 and 30 May 1989; and
- (b) the Chairman write to the Chairman of the Northern Land Council seeking its views regarding water management at Ranger.

Your Committee has made a practice of annual inspection visits to the Alligator Rivers Region. The Committee also makes such additional visits as are necessary, from time to time.

On 22 February 1989, after obtaining a report (Appendix C) on this release of water from RP4 from the Alligator Rivers Region Unit of the Department of Mines and Energy, your Committee deemed it desirable to carry out its own investigation of the matter and the various inter-related issues. It was determined that the Committee's visit to the Uranium Province to investigate the (RP4) water release at Ranger should include an inspection visit of Nabarlek and the Office of the Supervising Scientist at Jabiru to canvass other issues related to the environment.

For this visit, the Committee made arrangements to discuss these matters with OSS, the Department of Mines and Energy officers and officers of Ranger, in order that the Committee gain a first-hand appreciation of the physical and technical aspects arising from such water releases. A report of the Committee's inspection is contained at Appendix D.

The two major areas of current and ongoing environmental concern to the Committee are water and tailings management at the Ranger Uranium Mine, and the decommissioning and rehabilitation of the Nabarlek Project Area. In these activities the Committee has sought briefings and has worked closely with the Department of Mines and Energy and the Office of the Supervising Scientist as well as the companies concerned, i.e., Ranger and Queensland Mines Limited.

Conclusion

The Committee has appreciated the co-operation and assistance of the companies, departments and authorities involved or interested in the Alligator Rivers Region and in uranium mining activities whenever it sought such assistance or co-operation.

During the Committee's visit to the Alligator Rivers Region Research Institute at Jabiru in the Northern Territory on 30 May 1989 it was briefed by the Supervising Scientist upon the history of release of

water from the Ranger Mine site. The Committee was informed of a Commonwealth decision, in January 1989, to limit releases of water from the Ranger Restricted Release Zone to an average of one year in ten. It was further stated that technically the releases could occur annually, or as required under present water release standards without deprivation of the environment. This was his advice to the Commonwealth Government. However, he said the Commonwealth Government decision to permit release of RRZ water on an average of one year in ten was taken after "social factors", which were expressed by the ANPWS and the NLC, had been taken into account.

However, the release of water from RP4 by Ranger took place in accordance with proper authorisation. The Department of Mines and Energy conducted three water profile studies in Djalkmarra Billabong before, during, and after the release.

Pre-release biological screening tests on RP4 water were conducted by Ranger before and after the release dates as required. The Office of the Supervising Scientist and Ranger conduct simultaneous screening of RP4 water as well as in-stream field tests. Pre-release screening tests which commenced on 16 January 1989 were carried out and the Office of the Supervising Scientist and the Department of Mines and Energy were notified of results.

Monitoring of this release was carried out in accordance with the authorisation which specified daily and weekly analyses on samples of the water being released from Magela Creek upstream and downstream from the discharge point and of the Djalkmarra Billabong.

A report of these results was submitted to the Department of Mines and Energy, and the analysis of this data confirms that the release occurred within both the receiving water standards and separate total annual limits for Magela Creek. No environmental

deterioration of Magela Creek water was measured during the release.

The results of bankside and field tests which have been undertaken, and analysed, indicate that no impact occurred in the environment as a result of the current release.

GENERAL ENVIRONMENT

No matters relating to the general environment have been raised.

MONITORING AGENCIES

On a number of occasions, during its visits to the Alligator Rivers Region, your Committee has received opinions and suggestions for improving the efficiency and effectiveness of the various regulatory and monitoring agencies operating in the Region.

These suggestions have been expressed by various non-government and government bodies participating in the Region. During the Committee's most recent visit to Nabarlek, Ranger and offices of the OSS in May 1989, a number of points were made by officers of the companies concerned in this regard:

1. That the Research Institute was providing only limited service to the operators in the Region who have to bear the burden of the Uranium Export Levy which is used to fund the OSS and thus the operators have been forced to employ their own consultants, and to fund a PhD Scholarship at the Northern Territory University to meet research needs.
2. That considerable delays in the issuing of Authorisations under the Uranium Mining Environmental Control Act (UMEC)

were due to difficulties being experienced with liaison between the Office of the Supervising Scientist (OSS), the Northern Land Council (NLC), and the Alligator Rivers Region Unit of the Department of Mines and Energy.

As an example of these difficulties, it was cited that an application by Queensland Mines had been made to remove salty water from the mine site by irrigation to enable rehabilitation to begin. No answers, either in the affirmative or negative, had been received at the time of your Committee's visit, despite the application having been made some ten weeks earlier. The Committee was informed that the salty water was basically ammonium sulphate which is used by farmers as fertilizer. (Your Committee is of the opinion that there should not be a carte blanche approach to de-watering the mine site unless some baseline data guidelines are established, at least on an interim basis, to prevent damage to plant, animal and aquatic life.)

ALLIGATOR RIVERS REGION UNIT OF THE DEPARTMENT OF MINES AND ENERGY

The Committee has, under its various Chairmen, enjoyed a good deal of co-operation from this unit since its inception. Briefings for the Committee have always been provided promptly by officers of this unit even when these requests have been at short notice.

Your Committee has also been accompanied by senior officers from this unit when carrying out its visits to the Region. Their expertise has been invaluable in providing Members with briefings on the technical aspects involved.

From the opinions expressed by other operators within the Region, it would appear that the general consensus is that problems of understaffing of the Unit, especially in the professional categories of hydrology, geology, and the engineering disciplines, have resulted in a far less efficient operation than one could otherwise have expected.

The inability to provide such professional expertise is blamed on problems associated with the recruitment and retention of suitably qualified persons from outside the Northern Territory.

Factors such as the recent changes to the conditions of service for NTPS employees, which makes coming to the Territory less attractive, are largely responsible for the large turnover of staff. In fact, the Committee has had dealings with three different directors of the unit in the last three years. This does not auger well for a constant operational programme being able to be followed.

It was further claimed that the operations of the Alligator Rivers Region Unit of the Department of Mines and Energy were constrained by a general lack of staff, and a lack of professional expertise in appropriate areas of hydrology, geology and/or water and civil engineering.

However, your Committee is aware that there is an industry-wide shortage of professional staff and the Government, as an employer, will always find it difficult to attract and retain suitable staff in competition with private enterprise. Your Committee therefore recommends that continued efforts be made to improve this situation within the Unit perhaps by making more attractive the conditions of service applicable to such positions.

THE OFFICE OF THE SUPERVISING SCIENTIST

Operators in the region expressed the view that delays could be obviated by the relocation of the Office of the Supervising Scientist closer to its operational base. In general terms your Committee agrees with this view provided the operational constraints of the Office of the Supervising Scientist can be met.

The fact that the Supervising Scientist only travels to the Ranger Mine on average twice a year and Nabarlek less than once every

two years, no doubt due in part to his base being Sydney, lends some support to the proposal that his Office should be transferred to the Northern Territory along with his Department. This would enable him to adopt a higher local public profile and effectively deal with the alarmist myths publicised by some members of the environmental movement.

In addition, the Supervising Scientist is reluctant to lend his authority to dispelling the exaggerated claims conjured up and publicised by members of the environmental movement, even though he is aware that many such claims of environmental damage in the Region are without foundation. A higher profile in publicising OSS scientific activities and reports would lend greater credence to the value of the operations of the Office.

(i) LOCATION OF OSS OFFICE

The Committee considers that, in light of the administrative difficulties experienced in managing the various arms of the OSS from Sydney and also in the interests of improving the overall performance of the Office, all possible functions of the Office should be relocated to the Northern Territory. Such a relocation would present an ideal opportunity to reorganise the office into a more effective unit to support the regulatory efforts required of the Northern Territory in regard to both the uranium industry and the safeguarding of the environment in the Region.

The Office of the Supervising Scientist is divided into four functional units - the Supervising and Assessment Branch, the Policy Co-ordination and Information Branch, the Management Services Branch and the Alligator Rivers Region Research Institute. Of these, the first three are primarily located at Bondi Junction and the fourth in Jabiru. However, all functions of the Office of the Supervising Scientist are related to environmental protection procedures in the mining industry in the Northern Territory.

Therefore, your Committee is of the opinion that little justification exists for maintaining the majority of OSS staff in Sydney, 3000 km from its operational area. Significant cost savings and operational efficiency could eventuate if all OSS staff were to be redeployed to the Northern Territory and, in particular, to Darwin. The potential improvements in operational efficiency were previously recognised by the Commonwealth Government when the then Home Affairs and Environment Minister Mr McVeigh, in a press statement of 28 February 1983, stated "that all the staff of the Supervising Scientist would be moved to the Territory" (Attachment E).

To help establish a reputation for research, the proposed Environmental Radioactivity Laboratory should be located in Darwin as a component of the Northern Territory University. This would enable maximum publicity and credit for the work being done by the scientists. Consequently, your Committee is of the opinion that the environmental movement would be more sympathetically disposed to the work of these scientists if their efficiency were improved and their work were to be more widely reported.

(ii) THE SUPERVISORY AND ASSESSMENT BRANCH

The remote location of the Supervisory and Assessment Branch in Sydney complicates unnecessarily the regulatory role of the Northern Territory Department of Mines and Energy. It also causes delays, thus frustrating mining companies who expect that their applications for Authorizations will be dealt with expeditiously by suitably qualified people with first-hand knowledge of their mining operations. There would appear to be no useful purpose served by keeping this group in Sydney.

(iii) THE RESEARCH INSTITUTE

Two issues in respect of the Institute have been drawn to the Committee's attention:

- (A) The relevance of the research to the problems of the development of safe practices for mining in a wetlands environment:

While the Institute's more recent research has arguably been more applied than goal-directed, this has not been universally true; its study of uptake and loss of Radium 226 by fresh-water mussels, for example, has now been continuing since 1980. The Committee is concerned that the applicability of this research is unclear.

It was also asserted by the mining companies that this research into radium uptake in mussels carried out by the Research Institute was insufficiently relevant to the essential problems of mining uranium, and consequent environmental concerns, within the Kakadu National Park. The research results are not well publicised, and little is known of them outside of Jabiru. The results of this research may be scientifically interesting, but unless it can be shown that there is a significant benefit and measurable use of the research as an early indicator of environmental contamination of the creek systems in the region or risk to man from eating these mussels (and evidence exists to suggest otherwise) then the value of the research needs to be questioned.

An independent review mechanism to ensure the relevance and effectiveness of such research programmes may assist in this regard but none appears to exist.

The question of relevance in respect of Nabarlek is particularly pressing; almost no research appears to have been conducted there. It is indicative of the genuine interest of Queensland Mines Limited in encouraging appropriate research that the company is offering a

scholarship at the Northern Territory University to encourage research into salt-induced tree stress at Nabarlek.

- (B) The actual development of standards of safe practice for mining in a wetlands environment:

It is essential that standards of safe practice or mining in the wetlands environment be developed but such stands, practices or procedures in the following areas are still lacking, even after many years of investigation and research -

- the environmental impact of semi-dry tailings;
- an analysis of the impact of mining in the area on the food chain;
- the environmental impact of water disposal by land application;
- a practical biological testing protocol for water release;
- rehabilitation standards;
- standards for release of mine waters into creek systems;
- the establishment of a regional environmental database; and
- the environmental impact of rehabilitating the Tailings Dam in situ.

This appears to have been exacerbated by delays in the publication of the results of research work. The Committee has been advised that the median time between the completion of research work and that its subsequent publication in technical memoranda is approximately three years. Policy decisions on mining and associated environmental issues have to be made on a regular basis and within a tighter timeframe and such delays do not contribute to making informed decisions.

The Committee was informed that the Research Institute has on a number of occasions been unable to provide timely advice on many practical aspects of environmental control relevant to uranium mining. This is exemplified by:

- (i) The question of land application of water:

Ranger has been disposing of water by land application since 1984 and the OSS still considers it a trial. The OSS has not issued data for levels of water application. Die-back of trees has occurred in some areas and subsequently land application of water in these areas stopped. The specific reasons, however, have not been scientifically assessed.

- (ii) The question of the release of water from RP4:

Some 15 years ago the Fox Report recognised that water releases would occur under controlled conditions. Water release standards being used are those determined by the Department of Mines and Energy. The OSS has yet to determine water release standards or to accept the water release standards proposed by the Department of Mines and Energy.

(iii) The question of tailings disposal at Ranger:

The OSS has yet to determine whether it is more environmentally sound for tailings at Ranger to be returned to the mine pit or rehabilitated in situ.

Further, the mining companies asserted that the Institute does not employ anybody with experience of, or qualification in, mining and therefore does not fully appreciate and assess the technical and practical solutions available to mine in an environmentally acceptable manner; it is the view of the Committee that the Institute should employ some people with mining expertise to liaise with the companies involved.

The result has been that the solutions to operational problems which have been adopted during the course of mining are either ad hoc or are still to be developed.

In the view of the Committee, this is far from satisfactory.

SUMMARY

Your Committee recognises the prime need for the effective and efficient operation of the monitoring agencies in the Alligator Rivers Region. Decisions made relating to uranium mining and associated processing activities could affect the environment within the Alligator Rivers Region.

It must be acknowledged that the Commonwealth Government, having a major responsibility for uranium mining in the Territory, has a need for an organisation such as the OSS to review the operation of the mining of uranium as well as associated environmental matters.

Your Committee, in advocating the relocation of the Office of the Supervising Scientist and its research and administrative branches to the Northern Territory, does so in the knowledge that it must be achieved without compromising the OSS operations.

There would be difficulties in many areas to be overcome, in the retention of staff and other human resource problems associated with housing, etc., which would militate against such a relocation. It is also acknowledged that the OSS would experience similar problems to the Alligator Rivers Research Unit of the Department of Mines and Energy, though on a much larger scale, in the recruiting and of retaining suitable professional employees. However, your Committee believes that every effort should be made to solve such problems and relocate all possible functions of the Office of the Supervising Scientist presently located in Sydney.

CHAIRMAN

APPENDICES

- APPENDIX A REPORT ON COMMITTEE'S VISIT TO OLYMPIC
DAM - SOUTH AUSTRALIA:
SOME ENVIRONMENTAL CONSIDERATIONS
- APPENDIX B REPORT ON COMMITTEE'S VISIT TO AUSTRALIAN
NUCLEAR SCIENCE AND TECHNOLOGY
ORGANIZATION
- APPENDIX C REPORT BY ALLIGATOR RIVERS REGION UNIT,
DEPARTMENT OF MINES AND ENERGY - RELEASE
OF RETENTION POND NO. 4 WATER FROM
RANGER 1989
- APPENDIX D REPORT ON INSPECTION OF NABARLEK AND
RANGER MINES ON 29 AND 30 MAY 1989
- APPENDIX E PRESS STATEMENT - NT NEWS, 28 FEBRUARY
1983 (MR McVEIGH, MINISTER FOR HOME
AFFAIRS AND ENVIRONMENT)

OLYMPIC DAM - SOUTH AUSTRALIA
SOME ENVIRONMENTAL CONSIDERATIONS

Introduction

Olympic Dam, on the Roxby Downs pastoral lease, is 520 km NNW of Adelaide. The copper / uranium / gold ore body was discovered in 1975 by Western Mining Corporation (WMC) which formed a joint venture in 1970 in order to develop the orebody.

WMC (through its subsidiary Roxby Mining Corporation) holds 51% of the joint venture, BP Australia holds 36.5% and BP Petroleum Development Ltd 12.5%. The project is managed by the WMC subsidiary Roxby Management Services Pty Ltd.

The Mineral Deposit

The orebody has an area of over 20 km² and a vertical thickness of up to 350 m. Ore reserves (published 1983) are 450 million tonnes at 2.5% copper, 0.8% uranium oxide, 0.6 gram/tonne gold and 6.0 gram/tonne silver. The contained metal totals 11 million tonnes copper, 360 thousand tonnes of uranium oxide, 270 tonnes of gold and 2700 tonnes of silver.

Production, scheduled to start in the second half of 1988, will be 2000 tonnes uranium oxide per annum, 30,000 to 55,000 tonnes copper per annum and 90,000 ounces of gold.

Environmental Monitoring

There are six main areas involving environmental monitoring.

1. project area environmental monitoring including measurements of:
 - vegetation
 - fauna
 - sand movement
 - soil salinity
 - drawdown from mine dewatering
 - rehabilitation
 - meteorological conditions
 - dust deposition
 - sulphur dioxide levels;

2. monitoring of the impact pathway from groundwater extraction for water supply to possible effects on mound springs including:

- production water quantity and quality
- regional groundwater drawdown
- spring flow and water chemistry
- wetland flora and fauna
- barometric pressure
- evapotranspiration
- spring geometry;

3. radiation levels in the environment including:

- radon emanation from the soil
- radon in air
- radon daughters in air
- gamma radiation
- radionuclides in airborne dust
- radionuclides in water bodies
- radionuclides in vegetation
- radionuclides in fauna;

4. radiation exposures to designated employees including:

- radon daughter levels in work places
- radionuclides in dust
- gamma exposures;

5. other occupational exposures in the mine including:

- silica in dust
- nitrogen oxides
- carbon monoxide
- carbon dioxide
- noise;

6. medical records relevant to occupational health.

Environmental considerations vis a vis the Alligator Rivers Region

The principal contrast between Olympic Dam and the Alligator Rivers Region (ARR) is the climate. The former is arid and the latter tropical. This expresses itself in the water management at the respective mine sites.

Olympic Dam will have to import significant quantities of water from the Great Artesian Basin. The drawdown of the aquifer may impact on mound springs at the margin of the Basin. The mound springs are considered to be of scientific and historical significance. For this reason, the monitoring in (2) above is specifically emphasised at Olympic Dam.

The ARR water management, on the other hand, requires a carefully balanced system which ensures sufficient storage to meet mine requirements during the dry seasons and to minimize possible impacts of release during the wet seasons.

The land use of the respective regions is also contrasting. Olympic Dam is on and surrounded by pastoral leases, with some sites of aboriginal significance. The ARR is set in a collage with Kakadu National Park and Aboriginal Land.

Another significant difference is that Olympic Dam is an underground development. This can result in considerably greater radiological impacts on the workforce relative to radiological impacts in surface mines. In order to counter such impacts, well designed mine ventilation and comprehensive radon monitoring is essential.

Regulation

The mining and environmental regulation at Olympic Dam is with the South Australian Department of Mines and Energy. The project is subject to an indenture agreement which contains provisions for environmental assessment and monitoring and which has been approved by the SA Parliament.

The Office of the Supervising Scientist plays no role in the project!

AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANIZATION

Function and Objectives

The Australian Nuclear Science and Technology Organization (ANSTO) is a statutory body which was established by the ANSTO Act, 1987. ANSTO is the successor of the Australian Atomic Energy Commission.

The function and objectives of ANSTO are:

1. To encourage and facilitate the utilisation of, and benefits from, nuclear science and technology in medicine, industry, commerce, agriculture, science and the community at large.
2. To maintain a national centre of scientific and technological competence in nuclear science and technology by:
 - (a) developing and maintaining expertise in nuclear science and technology and in areas of relevance to nuclear science and technology,
 - (b) undertaking research and development, and maintaining an awareness of overseas research and development, in areas relevant to nuclear science and technology,
 - (c) establishing and operating major facilities related to nuclear science and technology, including reactors and accelerators.
3. To provide expert technical advice and information to the Government and the Australian community on matters relating to nuclear science and technology, including the Government's international initiatives in nuclear affairs.
4. To contribute to international endeavours to seek technical solutions to problems associated with nuclear activities including work on improving safeguards technology, nuclear waste management and the environmental impact of nuclear activities.
5. To provide an appropriate range of commercial and technical services and products, including the supply of radioisotopes and radiopharmaceuticals.
6. To facilitate the training of scientific, technical and research workers and the establishment and award of scientific research studentships and fellowships in matters relating to nuclear science and technology.
7. To make its expertise and facilities available to educational institutions and other persons for the conduct of research and of other activities related to nuclear science and technology.

Programs

Two particular ANSTO programs are being followed with interest in the NT; Synroc and Radionuclide Studies at Koongarra.

ANSTO has constructed a Synroc demonstration plant which aims to demonstrate feasibility of the Synroc technique for immobilizing high level radioactive waste. ANSTO is also conducting laboratory tests on Synroc with respect to durability and resistance to leaching.

The Koongarra program involves the study of migration through the environment of trace radionuclides which occur naturally in the Koongarra uranium deposit. This will lead to a better understanding of migration of radionuclides from radioactive waste disposal sites. The program is a joint project with the US Nuclear Regulatory Commission, the UK Dept of the Environment, the Japan Atomic Energy Research Institute and the Swedish Nuclear Power Inspectorate. The NT Dept of Mines and Energy provides significant field assistance for the program.

Uranium Enrichment

ANSTO, until 1983, was conducting considerable research into uranium enrichment. Much of the expertise of this program, in terms of both personnel and material, has now dissipated. The ex-head of the program - Dr Doug Eberling - is understood to be still with ANSTO.

RELEASE OF RETENTION POND NO. 4 WATER FROM RANGER 1989-
DEPARTMENT OF MINES AND ENERGY - ALLIGATOR RIVERS REGION UNIT

The background to this year's release is as follows:-

- . Retention Pond Number Four (RP4) is a silt trap which was designed to prevent silt from entering Magela Creek from the waste rock dump.
- . It is outside the restricted release zone, but since it is susceptible to contamination from seepage from the restricted release zone, its water quality is closely monitored and any discharges from this pond require the Minister's approval.
- . Releases from RP4 have been made annually since 1980, with the method of release being changed from time to time. Prior to 1984/85, release was by natural, uncontrolled overflow via a spillway into Djalkmarra Creek, which flows into Magela Creek. In 1984/85 and 1986/87, the water was pumped via a pipeline direct to Magela Creek.
- . In 1987/88 approval was given for release by controlled siphoning over the spillway to Djalkmarra Creek, but no release took place owing to a below-average wet season. Approval to release by the same method was given this year after consultations had taken place with the NLC, OSS and Ranger. The method of release was not the preferred option of either OSS or NLC, but it was considered to hold environmental benefits over other methods.
- . Releases from RP4 via the siphon began at around 2.00pm on Monday 20 and continued until 3.30pm on Wednesday 22 February. A total of about 10000 cubic metres of water was released during this time, which is equivalent to three minutes of flow in the Magela.

- . At all times the allowable additions to the creek were met and no environmental problems were observed. The estimated dilution ratio achieved during the release ranged from 1:350 to 1:1350.

- . RP4 holds about 200000 cubic metres and the quality of the water this year is similar to that which was being held in 1980. There has been little long-term deterioration of this water body over this time. Despite this, the OSS and NLC maintain that it could become contaminated as a result of the accidental dumping of some uranium-bearing waste rock during 1988. There is no evidence that this incident has had any impact on the quality of water in RP4.

- . The quality of the water easily meets drinking water standards - the limiting parameter for release is the magnesium concentration in the water. The uranium concentration at present is approximately 53 parts per billion, the drinking water standard for uranium is 1000 parts per billion. The water does not represent a radiological hazard.

- . Monitoring of this release has been intensive being the same as it would be for a release from the restricted release zone. The authorisation specifies daily and weekly analyses on samples from the water being released, the Magela Creek upstream and downstream of the discharge point and from Djalkmarra Billabong.

- . Ranger has submitted a report to DME on 27 February 1989 which demonstrated that the release occurred within both the receiving water standards and separate total annual load limits for Magela Creek. No deterioration of Magela Creek water was measured during the release.

- . Use will be made of this release to help field test and validate biological testing protocols which are presently under development by the OSS. Recent laboratory studies have shown that this water may have some impact on aquatic life at high concentrations. It is not known why this impact occurs or whether the observed effects are mine-related.

- . In accordance with the authorisation, Ranger conducted biological pre-release screening tests on RP4 water beginning on the following dates: 6 December 1988, 31 January 1989, 9 February 1989, 14 February 1989, 23 February 1989 and 28 February 1989. The Office of the Supervising Scientist has notified results of pre-release screening tests which commenced on 16 January 1989.

- . Ranger and OSS conduct simultaneous screening of RP4 water as well as in-stream field tests. DME has conducted three water profile studies in Djalkmarra Billabong before, during and after the release.

- . The results of bankside and field tests which have been completed indicate that no impact occurred in the environment as a result of this current release.

N.T. LEGISLATIVE ASSEMBLY

SESSIONAL REVIEW COMMITTEE ON THE ENVIRONMENT

INSPECTION OF NABARLEK AND RANGER MINES ON 29 AND 30 MAY 1989.

Members of the Committee :

- Nick Dondas (Chairman)
- Steve Hatton
- Col Firmin
- Neil Bell
- Stanley Tipiloura
- Graham Gadd (Secretary)

accompanying the committee were:

- Tony McGill (Director Alligator Rivers Region Unit,
Department of Mines and Energy, N.T. Government advisor)

The Committee departed from the Darwin Air North terminal at about 0900 on 29 May for Nabarlek.

At Nabarlek, the Committee was met by Mr Brian Olver (Queensland Mines Limited (QML) Site Manager), Mr Peter Bailey (QML Environmental Superintendent), Mr Greg De Ross (QML Exploration Manager, Australia) and Mr Colin Hallenstein (QML Exploration Manager, N.T.).

Mr Bailey briefly described the Nabarlek Project and expressed the following opinions:

- (i) He believes that there is a move by the Commonwealth to take control of regulation of uranium mining from the N.T. Government and give it to the Office of the Supervising Scientist (OSS).
- (ii) This move is being actively supported by the OSS and the Northern Land Council (NLC) who prefer to operate under Federal legislation. The Miscellaneous Workers Union have also pushed for Commonwealth rather

than Territory control.

(iii) Mr Bailey believes that the N.T. Government is losing the battle for control because the OSS are better funded and have more staff than the Alligator Rivers Region Unit of D.M.E.

(iv) Mr Bailey made a point that although QML have to bear the burden of the Uranium Export Levy which is used to fund the OSS, the Research Institute was providing no service to them and QML have to employ their own consultants and fund a Ph.D Scholarship at the N.T. University to meet their research needs.

(v) He stated that delays in the issuing of Authorizations under the UM(EC) Act were due to difficulties being experienced with the Office of the Supervising Scientist (OSS) and the Northern Land Council (NLC) as well as due to the lack of appropriate staff in the Alligator Rivers Region Unit of the Department of Mines and Energy.

(vi) He claimed that the Water Resources Branch in 1978 or 1979 had an establishment of 45 or 48 positions to deal with water problems in the Alligator Rivers Region. He stated that only two or three of these positions are currently filled. The Alligator Rivers Region Unit has no expertise in hydrology, geology, or water and civil engineering.

(vii) He cited, as an example, the wish of his company to begin removing salty water from the site by irrigation so that rehabilitation could begin. No answer had not yet been received despite the application having been made some ten weeks earlier. The Committee was informed that the salty water was basically ammonium sulphate which is used by farmers as fertilizer.

(viii) Mr Bailey informed the Committee that the road between Cahill's Crossing and the mine site was closed to all but local traffic and had a 2 ton limit placed upon it by the Oenpelli aborigines. He stated that QML had allowed \$50,000 for road maintenance this year and it was still uncertain who else would be contributing towards the maintenance of this road which had been badly cut up last wet season.

Mr Hallenstein told the Committee that exploration on EL 2508 (immediately surrounding the Nabarlek mine) was set to commence, and he expected that drilling would commence later in the year. Agreement had yet to be reached with the NLC on exploration on ELA 2505 which surrounds the Nabarlek 2 orebody.

The Committee was then taken on a tour of inspection of the Nabarlek site. From the edge of the pit Mr Bailey explained that all of the tailings produced during the milling operation had been returned to the pit, covered with a blanket of synthetic fibre cloth and then been covered with some 2 metres of crushed rock. Filter wicks had been driven through the tailings to allow entrapped water to be released to the surface, thus hastening the consolidation of the tailings. The floor of the pit was seen to be covered with a shallow layer of water which Mr Bailey explained contained some dissolved radium. Mr Bailey stated that the remaining volume in the pit could be used as a receptacle for storing additional tailings should the mill be recommissioned in the future.

The Committee was then driven around the walls of the evaporation ponds and the spillways and overflow channels which direct water back into the pit were pointed out.

Mission grass, which is a declared noxious weed, had been found growing around the walls of the evaporation ponds and elsewhere on site and it had recently been sprayed with the herbicide Roundup. Overspray had caused the death of a number of small trees around the ponds.

The floor of the evaporation pond No. 2 was half exposed. The total volume of water being stored was stated to be some 400,000 cubic metres.

The Committee was driven to the stockpile pad where heap leaching of the remaining low grade ore was taking place.

The Committee was then driven to the site of forest land application of salty water which had been conducted in 1986. Deaths of some eucalypt species were pointed out but it was clear that there had been significant regrowth of other species, notably ironwood.

The Committee then flew to Jabiru and checked into the Crocodile Hotel for lunch.

At about 1400 the Committee visited the Alligator Rivers Region Research Institute where it was addressed by the Supervising Scientist, Mr Bob Fry. Mr Fry talked about the history of release of water from the Ranger Mine

site which culminated in a Commonwealth decision in January 1989 to limit releases of water from the Ranger Restricted Release Zone to an average of one year in ten. He stated that he believed that technically the releases should occur annually or as required, and that this was his advice to the Government. However the Government's decision was taken after social factors which were expressed by ANPWS and the NLC had been taken into account.

Dr Chris Humphries (aquatic biologist), Dr. John East (geomorphologist), Dr Ross Hyne, (biologist) and Dr. Riaz Akber (physicist) were present and briefly addressed the Committee. Dr Humphries explained some of the work being undertaken into toxicity of mine waters to fish and expressed his opinion that water from RP-4 at Ranger was still passing out of Djalkmarra Billabong into the Magela.

Dr East explained that after the ore had been mined it occupied a larger volume by an amount known as the swell factor. This would create an elevated landform. The final rehabilitation of the Ranger mine would involve a carefully designed and contoured structure of some thirty metres high.

Dr East described some of the research work that he was undertaking in conjunction with Ranger and ANSTO into the shape of rehabilitation structures on the Ranger mine site which were designed to last 1000 years. Comparisons of alternative slopes were being made and Dr. East stated that he thought the rock at Ranger eroded quite rapidly. All of the scenarios which were described by Dr East assumed that transfer of the tailings from their present location in an above ground dam to a below ground site would occur which is at variance with the Ranger five year rehabilitation plan. He also assumed that only the current ore body and one other would be mined.

Mr Fry then took the Committee around the research laboratories for a more detailed look at some of the research work being conducted by the OSS scientists. He then provided cars to take the Committee to the confluence of the Djalkmarra creek and Magela Creek where field validation of laboratory toxicity tests had been studied during the release of water from RP-4 last wet season. Both Djalkmarra Billabong and the

Magela were seen to have large numbers of small fish swimming in them and the Committee was told by Dr Humphries that although some dead fish had been seen it was presumed that this was a natural event.

At around 0900 on 30 May 89 the Committee visited Ranger Uranium Mine and were met by Ranger's Visitor Liaison Officer Robin Banackowski. The members were provided with the necessary safety equipment and were taken up to meet the Ranger management.

The Committee were introduced to Mr Bob Cleary (General Manager - Operations), Mr Peter McNally (Manager - Environment), and Mr Bob Henderson (Manager - Special Projects). Mr Cleary began by giving a general description of the layout of the mine. He discussed the history of the agreement to release water from RP-2 and advised the Committee that Ranger had spent a considerable amount of money deepening this pond and conducting research into seepage collection and methods to reduce water intake into the mine in the understanding that they would be given approval to release excess water in accordance with Best Practicable Technology.

Mr McNally stated that a mediator employed to assess the merits of OSS release mechanisms had been ignored by the Commonwealth and that the company still had strong reservations about the usefulness of biological pre-release screening which were Commonwealth preconditions for release.

Mr McNally stated that although the director of the Research Institute had stated in the media that RP-4 was so toxic that no safe dilution could be determined for its release, in fact no effects from the release had been detected in the field.

The Committee were then taken on a tour of inspection of the operations. At the tailings dam, the subaerial (semi-dry) tailings management system was explained and rubber devices to control spraying in the event of leakage from the tailings line were pointed out.

The mine pit was almost completely dry and a slip which had developed in the south wall had been stabilised. The Committee was advised that the

mine pit outline was final but that it was roughly half its eventual design depth. Mining of this pit was scheduled to be complete by 1991 or 1992.

In the mill, safety features such as the dust scrubbers on transfer points and fire protection systems were pointed out. An outline of the process used by Ranger to produce the uranium oxide product was given and a discussion of the product stockpiles being held took place.

The Committee were driven to the Ranger Environmental Laboratory where Mr Greg Sinclair (Chief Chemist) explained that the company were trying to rationalise the monitoring programs through meetings such as the Periodic Surveillance Committee meeting.

He described a joint research project with ANSTO which was aimed at modelling the seepage from the Ranger tailings dam in order to facilitate long term rehabilitation.

The fish toxicity lab was then visited and Mr John Bywater (Biologist) explained details of the water toxicity pre-release screening studies which were being undertaken by Ranger.

The Committee then returned to the Ranger Board room for lunch and further discussions at around 1245 and were introduced to Mr John Farthing of ERA.

The Committee departed for Darwin at about 1400.

\$10m. lab for

Jabiru pledge

By PETER WILSON

The Federal Government will build a \$10 million laboratory and scientific institution at Jabiru to monitor environmental controls if returned in the election.

Home Affairs and Environment Minister, Mr Tom McVeigh, in Darwin to campaign for CLP candidates, said today a public works committee would be in the Top End soon to hold a public inquiry on the plans for the project.

He said all the staff of the supervising scientist — at present stationed mainly in Sydney — would be moved to the Territory.

Mr McVeigh said an associated laboratory and computer would be set up in Darwin.

The laboratory and back-up facilities in Darwin would be built in the Territory because environment control should be the responsibility of the Territory.

"The NT should be a State as soon as possible," Mr McVeigh said.

National Parks like Kakadu were part of the responsibilities and rights of a state government.

"We are moving to a situation where the Northern Territory quite rightly and quite properly controls matters of its own destiny," he said.

He described the ALP's proposed task force for the development of Northern Australia as a straight insult to the electors of the Territory.



Mr McVeigh

• Election cover:
Page 2



Atom. Lab for Jabiru pledge



Mr. McVie...

The Government has pledged to build a 210 million...
National Park...
where the Northern Territory...
will be...
be said...

The Government...
pledge...
the Government...
pledge...
the Government...
pledge...