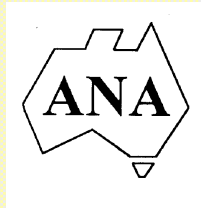


URANIUM MINING AND ENVIRONMENTAL ISSUES IN AUSTRALIA



**BY DR CLARENCE J. HARDY
AUSTRALIAN NUCLEAR ASSOCIATION**

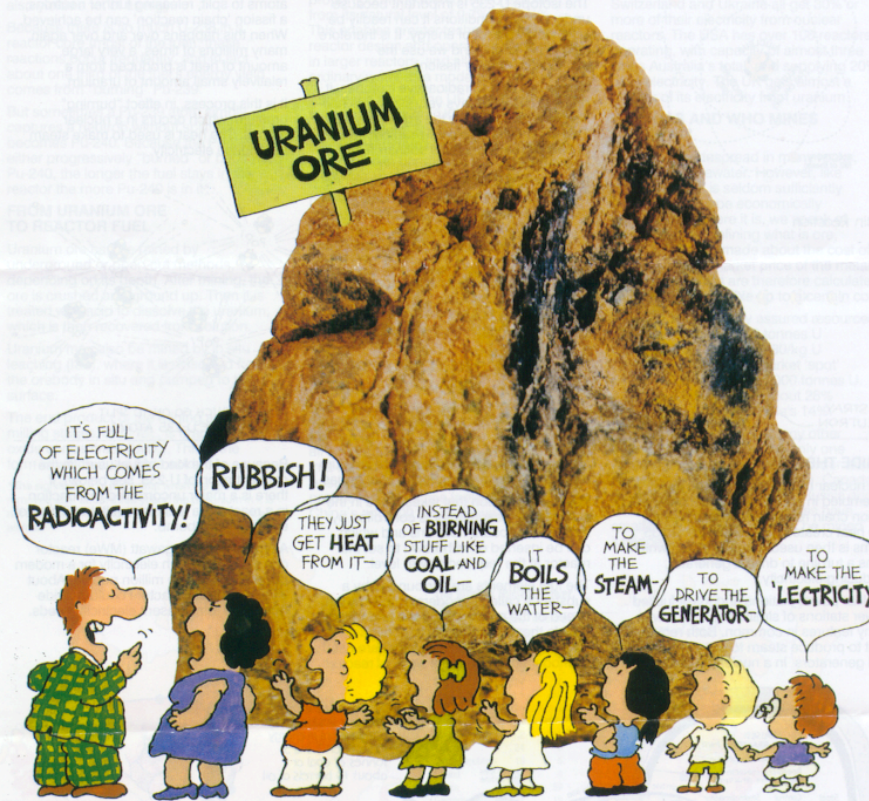
**PUBLIC INFORMATION AND OUTREACH SESSION (III)
14PBNC
HONOLULU, 21-25 MARCH 2004**

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URANIUM MINING AND ENVIRONMENTAL ISSUES IN AUSTRALIA

Brochure
For
Schools
From
UIC

What is Uranium? How does it work?



URANIUM MINING AND ENVIRONMENTAL ISSUES IN AUSTRALIA

1. URANIUM RESOURCES

Australia has a total of 689,000 tonnes of Uranium recoverable at a cost less than US\$40/kg.

This represents 44% of the World's resources

in comparison with:

20% in Kazakhstan

18% in Canada

8% in South Africa and

10% in Other Countries.

URANIUM MINING AND ENVIRONMENTAL ISSUES IN AUSTRALIA

2. URANIUM PRODUCTION

**In contrast with the 44% of resources
Australia only has 19% of the world's
uranium production in comparison with:**

32% in Canada	18% in Africa
8% in Kazakhstan	8% in Russia
5% in Uzbekistan	10% in Other Countries

**The reasons for this are partly due to political and
partly due to environmental issues.**

URANIUM MINING AND ENVIRONMENTAL ISSUES IN AUSTRALIA

3. HISTORICAL BACKGROUND

Uranium was produced for many years from near-surface mines at Rum Jungle and Nabarlek in the Northern Territory and the Mary Kathleen Mine in Queensland.

After discovery of the large Ranger Uranium Deposit in the NT in 1970, the mine and mill were developed as a major operation in the 1980s.

The Olympic Dam deposit was then discovered in South Australia and was recognised as a very large copper-uranium deposit.

Near-surface deposits were also discovered in South Australia and the deposit at Honeymoon is now an acid-leach mine.

Production from the three operating mines in 2003 was:

Ranger	5,065 te
Olympic Dam	3,176 te
Honeymoon	717 te
Total	8,958 te U ₃ O ₈

URANIUM MINING AND ENVIRONMENTAL ISSUES IN AUSTRALIA

4. ENVIRONMENTAL AND REGULATORY ISSUES

There has been public interest and concern about uranium mining in Australia for over 30 years.

This has led to all of the operations requiring major environmental impact assessments, extensive public consultation and on-going monitoring.

Public & government concerns that Australia's uranium will only be used for peaceful purposes has also required a high level of regulation. The uranium industry in Australia is therefore probably the most highly regulated and monitored uranium industry in the world.

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URANIUM MINING AND ENVIRONMENTAL ISSUES IN AUSTRALIA

5. CASE STUDY FOR THE RANGER URANIUM MINE

There was a major government inquiry into the Ranger Mine and a major environmental study of the region was carried out before approval was given to start operations.

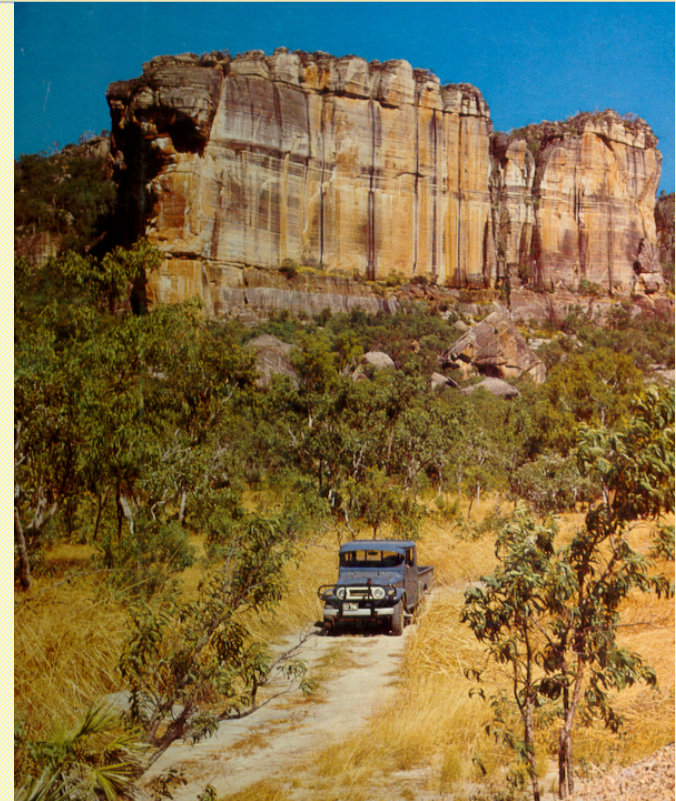
Reasons for the inquiry and the study were that the mine area is surrounded by the World Heritage Kakadu National Park, and a large part of the Park has been granted to the Aboriginal owners.

It is therefore easy to understand that there is concern by the public, the Aboriginal owners and by the government that the environment must be protected from potential contamination from the mine's operations.

URANIUM MINING AND ENVIRONMENTAL ISSUES IN AUSTRALIA



Wetland region
near Ranger



Spectacular escarpment
views near Ranger

URANIUM MINING AND ENVIRONMENTAL ISSUES IN AUSTRALIA

7. PATHWAYS FOR POTENTIAL CONTAMINATION

The main pathways for potential contamination of the public by radiation from mining operations are:

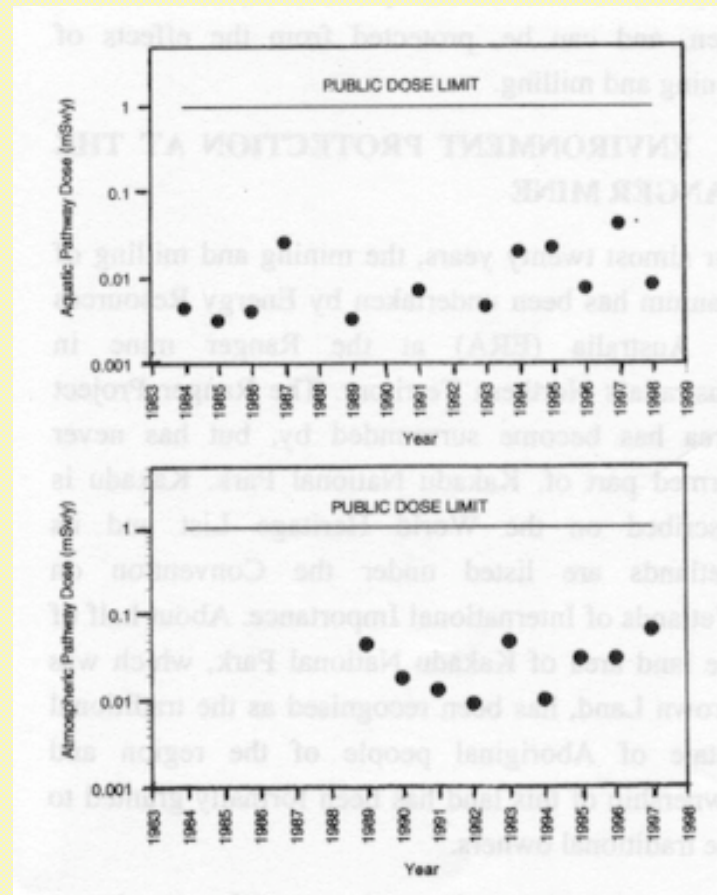
- ** Surface water transport of long-lived radionuclides of the uranium series contained in waters discharged from the mine site, and**
- ** Atmospheric transport of radon and short-lived progeny and dust containing long-lived nuclides of the uranium series.**

Doses to the public were calculated based on models of water and dust transport by ERISS, the Environmental Research Institute of the Supervising Scientist, operated by the Commonwealth Government. The calculated doses were based on extensive data measured in the region. The results were compared with dose limits recommended by the ICRP (International Commission of Radiological Protection)

URANIUM MINING AND ENVIRONMENTAL ISSUES IN AUSTRALIA

7. PATHWAYS FOR POTENTIAL CONTAMINATION (CONTINUED)

From paper by
Dr A. Johnston
(ERISS) at
ANA 99
Conference,
Canberra
October 1999



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URANIUM MINING AND ENVIRONMENTAL ISSUES IN AUSTRALIA

7. PATHWAYS FOR POTENTIAL CONTAMINATION (CONTINUED)

CONCLUSIONS ON DOSES AND DOSE LIMITS

In all the years of operation of the Ranger mine, the estimated radiation dose to the public was less than the dose limit by more than a factor of 20.

The results were published every year by ERISS.

In addition, chemical and biological monitoring was carried out regularly to ensure the protection of aquatic species.

The results of all of these studies has shown that there have not been any adverse effects on the aquatic fauna of the Kakadu National Park.

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URANIUM MINING AND ENVIRONMENTAL ISSUES IN AUSTRALIA

8. PROVISION OF PUBLIC INFORMATION

The Government, the uranium mining companies and the Australian Nuclear Association believe that education is essential in this important field.

All of these organisations have provided information on uranium and the peaceful applications of nuclear technology to the public and to schools.

Examples are:

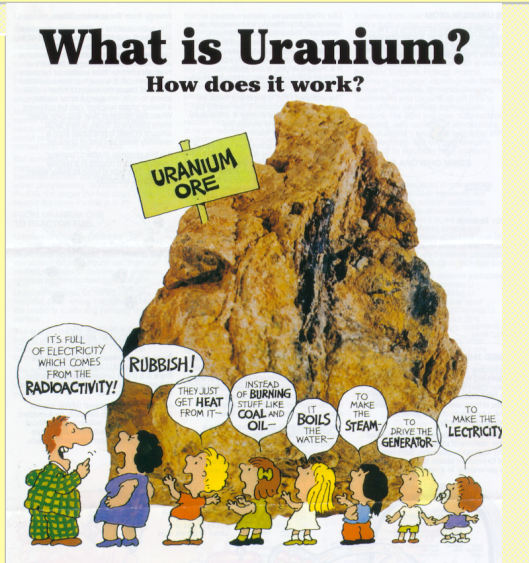
UIC Brochures on Uranium and many other topics

UIC book – Nuclear Electricity

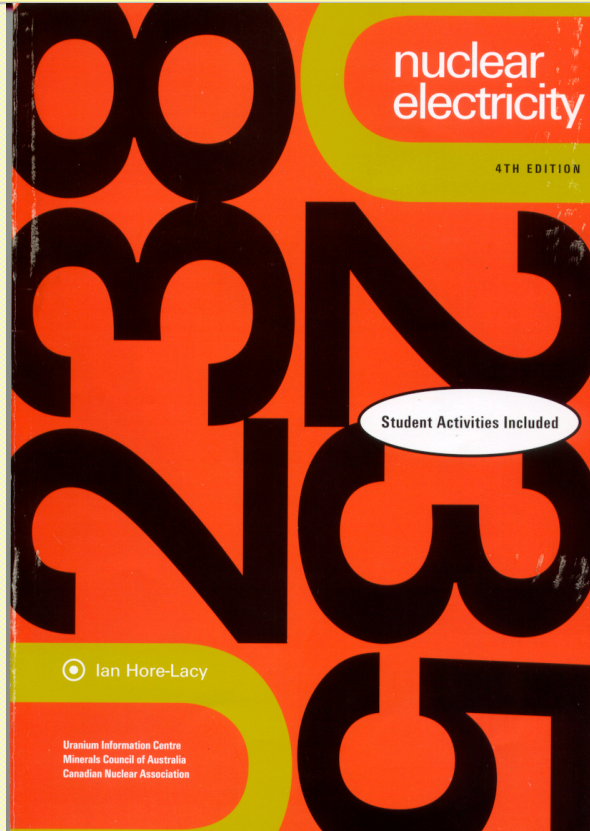
ANSTO – Handbook and Exhibition at Easter Show, Sydney, 2003

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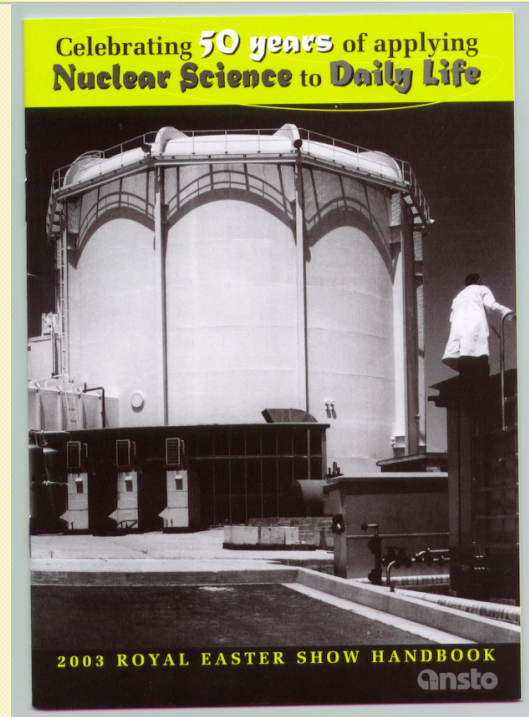
EXAMPLES OF PUBLIC INFORMATION



UIC brochure
for Schools



UIC sponsored book for schools



Booklet from ANSTO
for Easter Show, 2003

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Conclusions

- * **There has been public interest and concern about uranium mining and the environment in Australia for over 30 years.**
- * **This has led to all of the operations requiring major environmental assessments, public consultations and on-going monitoring.**
- * **The uranium industry in Australia is therefore probably the most highly regulated and monitored uranium industry in the world.**
- * **Government and industry has provided extensive information to the public over many years on all mining and other projects.**
- * **The Australian Nuclear Association has contributed to the provision of information by holding regular national conferences which address all of the important issues in nuclear science and technology, especially uranium mining, radioactive waste management and the many applications of nuclear technology.**

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