

*The Nuclear Issues Coalition*

submission to the

**Jabiluka Project  
Draft Environmental Impact Statement**

January 8, 1997

*The Nuclear Issues Coalition*

The Conservation Centre

120 Wakefield St., Adelaide S.A. 5000

tel: (08) 8223 5155

fax: (08) 8232 4782

# 1. Foreword

1

This submission has been put together by the Nuclear Issues Coalition. The Nuclear Issues Coalition is a coalition of environmental groups with an interest in issues such as uranium mining, processing and use, radioactive waste, radiation health and safety, and nuclear energy. The group is voluntary but has access to the services and resources of the Conservation Council of SA (CCSA). The CCSA is the umbrella organisation for 67 environment groups in South Australia with a total membership of about 60,000.

The Nuclear Issues Coalition is opposed to:

- All aspects of the nuclear fuel cycle.
- Uranium exploration, mining, milling , processing and export.
- Nuclear power.
- Nuclear weapons construction, testing and use.
- The use of nuclear reactors for research and for the production of radioactive isotopes.
- The mining, milling, processing and export of radioactive materials including thorium and rare earths.

The Nuclear Issues Coalition strongly supports:

- The minimisation, and eventual elimination, of radioactive wastes.
- Minimising the use of ionising radiation including X-rays.
- Minimisation of the use of radioactive isotopes.
- Environmentally benign alternatives to nuclear power.

## 2. Introduction

### 2.1 Global Issues

It is 20 years since the Ranger inquiry. In the meantime there have been two major reactor accidents - Three Mile Island in 1979 and Chernobyl in 1986 - a sharp downturn in the uranium market, and the release onto the world market of weapons grade uranium and plutonium.

The reactor accidents occurred in the USA and the USSR. These countries were two of the most technologically developed countries in the world being, at the time, the only two countries with the technology to put spacecraft in orbit. The assertion promulgated by the nuclear industry that nuclear power is extremely safe and that the chances of a major reactor accident are negligible has been clearly demonstrated to be grossly misleading.

The release of the weapons grade uranium from the USA and the former USSR onto the open (and also the black) market underlines the fact that there is a close connection between military and civil nuclear activities. This connection has been vigorously denied by the nuclear industry.

We note that a strong supporter of the nuclear industry, Sir Ben Dickenson, states (Letters to the Editor, *The Advertiser* Feb. 2 1996):

*“There is no doubt that uranium is a strategic material and that its military and diplomatic strength cannot be over-emphasised.”*

We also note that the former governor-general of Australia, Mr Hayden, revealed that as foreign minister in 1984 he proposed to the prime minister that Australia improve its nuclear technology - perhaps by building a nuclear power station - in order to provide itself with the facility to assemble a nuclear weapon at short notice (Editorial, *The Advertiser*, April 6 1996).

Mr Hayden has acknowledged the validity of the <sup>2</sup>argument, propounded by the environment movement and denied by the nuclear industry, that a major motive for a country adopting nuclear energy is to put itself in a position of readiness to produce nuclear weapons. This has been historically obvious and is undoubtedly still occurring; Indonesia, for example, has failed to explain why it needs nuclear power when it has an abundance of fossil fuels and solar energy.

The safety of nuclear power stations, the use of uranium in nuclear weapons programs, and the problem of decommissioning of nuclear reactors are issues that are an integral part of the nuclear industry which starts with uranium exploration, mining and processing. **We therefore maintain that the Draft EIS is seriously deficient in not addressing these issues.**

## 2.2 Environmental Issues

All mining and milling activities in Australia, covering a period of 41 years, have had serious environmental impacts. It may also be argued that, by virtue of uranium processing, plutonium production, and weapons testing, the activities have impacted on the environment in other countries, and on the globe in general.

The major documented environmental impact of the Radium Hill mine in SA was its contribution to the UK nuclear weapons programme including the nuclear weapons tests at Maralinga that led to eviction of indigenous people and to contamination from radioactive and toxic materials at Emu Plains and Maralinga. The remediation of the worst contaminated sites involving plutonium dispersion is only now, some 30 years later, being carried out at great cost. Much finely dispersed plutonium and other toxic materials will inevitably escape this remediation process. The prospects for safe return of the indigenous people to the area are not good.

Mining and milling of uranium ores at Radium Hill in SA from 1951 to 1961 produced radioactive tailings which were either stockpiled, used as ballast on railway lines, or stored in a tailings dam (South Australian Mines Department, *Atomic Energy*, vols.4(4),p8, 1961 and 5(1), p21 1962.)

Wastes from the processing of uranium concentrate from Radium Hill and of rare earths at a site adjacent to the sea at Port Pirie from 1955-62 were stored in a tailings dam. The management of the tailings dam deteriorated over the years to the point that children were playing on its surface. After six years of community pressure and after high tides breached the walls of the tailings dam in 1981, the tailings dam wall was increased in height, the tailings were covered, the area was re-fenced, and a trench was constructed to drain the tailings into an evaporation pond (*The Advertiser*, August 4 1982).

In 1982, at the Honeymoon uranium mine in SA, a process known as *in situ leaching* was trialed. In this process, corrosive liquids are injected into the ore bearing strata with the aim of dissolving the target minerals which are then brought to the surface through pumps. These pumps must be placed and operated in such a way as to prevent the leach solution from moving laterally and vertically into other strata, especially aquifers.

The mining trials were vigorously opposed by the environment movement in SA and eventually the trials were discontinued by the Government after it was found that blockages, which affected the ability of the operators to control the movement of the leach solution, had occurred.

It is noteworthy that the problems that characterised uranium activities 40 years ago are the same ones which we encounter with present day uranium mines in Australia. These problems involve

water use, water contamination, tailings or wastes<sup>3</sup>(including runoff) and health and safety. It is also noteworthy that, just as in the early ventures, the companies involved, while freely admitting to past mistakes in the industry, deny that there is a current problem.

For example, in a recent article titled “*Uranium mines to shed shoddy ‘50s’*” (*The Australian* May 4 1996), the uranium mine at Rum Jungle was described by a water quality scientist for the Northern Territory Government as “a very shoddy mining operation”.

The article describes how the Rum Jungle uranium mine contaminated the Finnis River and how mine rehabilitation in the 80’s had failed and that a current five year monitoring and rehabilitation project begun in 1993 had been successful in restoring the area. This represents a span of some 40 years between creation of a major environmental problem and its remediation which, however, can not undo the damage already done. According to the scientist, any future project at Jabiluka would be accompanied by continual supervision and rehabilitation.

Similarly, the chief executive of Energy Resources of Australia has claimed (*The Australian*, May 25 1996) that a lot has happened in terms of state of the art technology for building uranium mills and tailings operations in the last 17 years.

These assurances are in stark contrast with recent (1993) experience at the Roxby uranium venture which, despite being a very recent operation by a very large and well resourced mining company and despite monitoring by both the mining company and the SA Government, suffered a massive loss of tailings liquid into the ground beneath the tailings retention system (*Roxby Downs water leakage*, Parliament of South Australia, Environment, Resources and Development Committee, 19<sup>th</sup> Report, April 10 1996). This leak occurred over a period of several years and there are no plans to clean up the toxic, radioactive material which leaked from the tailings retention system. Furthermore, the company involved was not financially penalised for its failure to prevent escape of the contaminated water.

### **2.3 Worker Health and Safety**

Major reforms are required in this area.

2.3.1 The 1995 NH&MRC “*Recommendations for Limiting Exposure to Ionising Radiation and National Standard for Limiting Occupational Exposure to Ionising Radiation*” is indicative of the problem of regulating exposures to ionising radiation. The recommendations in the document were based on 1991 International Committee on Radiological Protection (ICRP) recommendations, which followed the 1989 US recommendations (BEIR V report), which followed the 1987 UK (NRPB) guidelines, which followed general acceptance of the re-assessment of data from Hiroshima survivors. It took the *expert* NH&MRC 8 years to get to the stage of making recommendations, and even now some State Governments have not legislated to accommodate NH&MRC recommendations.

This time lag is unacceptable and the delay can be attributed at least partly to the nuclear industry who challenged the analysis of the Hiroshima data and who have a large influence on committees such as ICRP.

2.3.2 There is a major problem with radiological protection committees in that they invariably amount to the fox watching the chickens. In South Australia, prior to 1990, the committee was made up of experts who were all involved in some way with the use of ionising

radiation, either the medical or industrial <sup>4</sup>uses of X-rays or uranium mining. There were two exceptions, an environment expert who was nominated by the CCSA, and a geneticist, everyone else was employed or received research grants from, the industry which it was supposed to be regulating. At that time there were no members who represented either medical or uranium mining/milling workers. At one time a Western Mining Corporation shareholder participated in the discussions and decisions on WMC's uranium mine at Roxby Downs.

This is a highly undesirable arrangement which can only hinder the proper functioning of such committees which should be reconstituted such that at least 2/3rds of the membership is independent from the industry which it is entrusted to regulate.

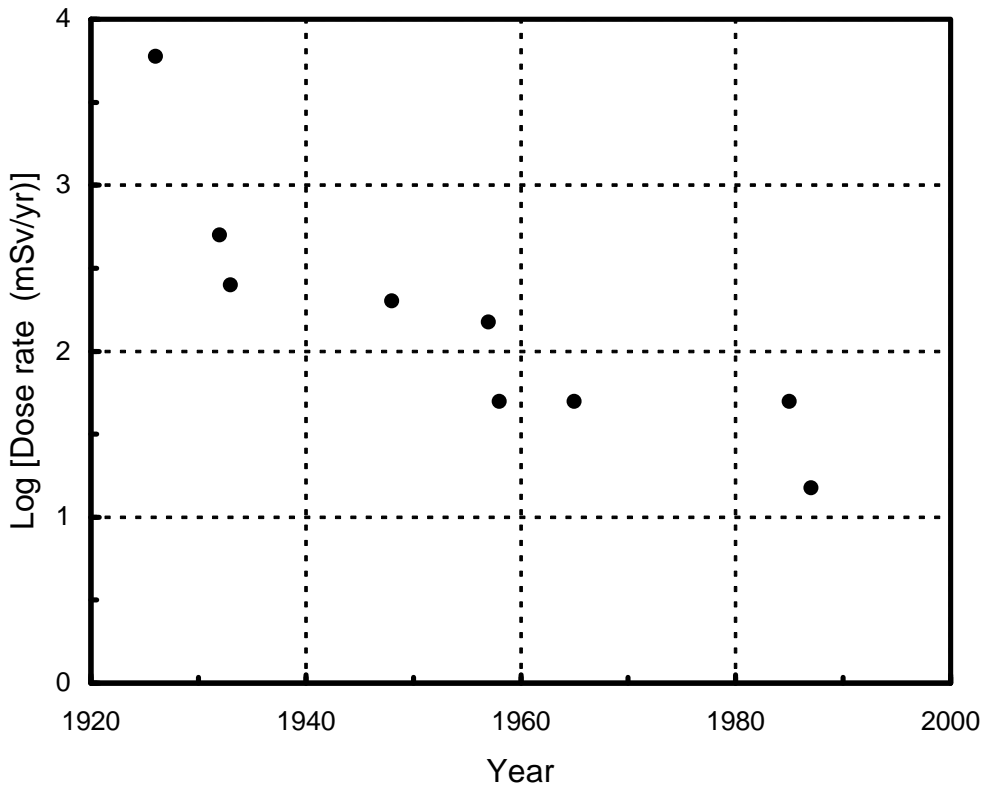
- 2.3.3 The recommended allowable exposure to ionising radiation has been steadily decreasing from the earliest days of radiological protection. There has not been a single case where the allowable dose has been increased. As our knowledge of the effects of ionising radiation increases so the risks associated with it have been found to be higher and higher. There is an irrefutable trend in the assessed risk yet the NH&MRC and other groups whose brief it is to protect people from ionising radiation have not taken this into account.
- 2.3.4 From 1934 to 1991 the maximum allowable exposure of workers to ionising radiation has been decreased from 500 to 20 mSv/yr (Table 2.1).

Table 2.1 Maximum Permissible Dose Rate Recommended by ICRP for Workers (1934-77 data from: A.Martin and S.A.Harbison, *An Introduction to Radiation Protection*, 2<sup>nd</sup> Ed., p60, 1979).

Year	Dose Rate mSv / Yr
1934	500
1950	150
1956	50
1977	50
1991	20

The decrease has been steady with a half life of about 14 years (Figure 2.1). In other words, on the average, the limit has been halved every 14 years.

Figure 2.1 Semi-log Plot of the Change in <sup>5</sup> Recommended Dose Limits for Workers.  
After Woodward, [*Search*, **22**(4), 131, 1991]



This very obvious trend has not been taken into account at any time except that it could in theory be covered by the ALARA (As Low as Reasonably Achievable) requirement. However, this legal requirement has not, in general, been enforced. For example, in the year 1988/89 at the Roxby mine/mill in South Australia, 29 workers received doses of 20 mSv/yr and higher. At a public meeting at Roxby Downs in 1990 Mark Sonter, the radiation safety officer at Roxby, said that there would be no difficulty in meeting the new ICRP recommended maximum dose of 20 mSv/yr. This clearly demonstrates that the ALARA principle was not taken seriously at Roxby.

2.3.5 The analysis of the Hiroshima data on which the ICRP and hence the NH&MRC recommendations are based found a 3-4 fold increase in the risks associated with exposure to low levels of ionising radiation. However, neither ICRP nor NH&MRC have decreased their recommended exposure limits by this amount. Their recommendations amount to a less than 2.5 fold decrease. This was because the ICRP adopted a new measure of the risk and with this were able to make recommendations which were less severe for the nuclear industry.

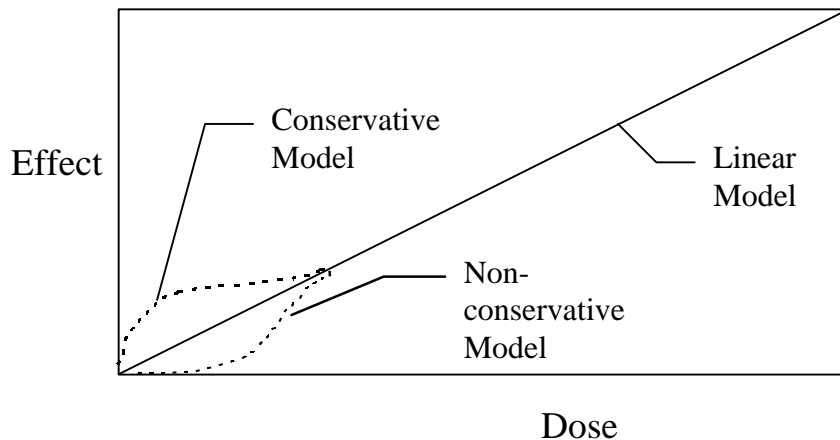
2.3.6 Apart from lowering the maximum permissible dose from 50 to 20 mSv (instead of 50 to 15) there is an escape clause in the form of using a five year average. A worker may get a 50mSv dose in one year (or even one day) provided they received no more than 100 mSv in five years. Thus an employer is able to rotate a number of workers through a particular job, which would normally be done by one worker, in such a way that the 5 year dose is less than 100 mSv. This is completely contrary to what is acknowledged world wide, namely that the total risk is proportional to the total dose. Thus the total risk is exactly the same whether 100 mSv is received by 1 person or whether 2 people receive

50 mSv each. If the risk is such that one <sup>6</sup>person in a thousand will get cancer then doubling the workforce will still lead to one person getting cancer; the risk *per person* is decreased but the total risk is the same.

What the "5 year average" escape clause does is to enable the total dose received by the group to be much higher than if only one person did the task, and the chances of adverse health effects is proportionally higher. For example, if ten people share a high exposure task and each one gets the maximum dose then the total risk is ten times that if only one worker did the task designed in such a way to keep the exposure below the maximum dose.

2.3.6 The recommendations on maximum dose rates are based on an assumption that at low doses there is a linear relation between dose and effect on human health and that there is no safe dose. This is often described by the nuclear industry as a conservative assumption. This is incorrect, a conservative assumption would be that the risk was greater than that predicted by the linear model. Conversely, a non-conservative assumption would be that the risk is less than that predicted by the linear model. The linear model is a compromise between these two approaches. The three models are shown in figure 2.2.

Figure 2.2 Three Models for the Relation Between Dose and Effect



Because of insufficiently rigorous safety standards many workers at Radium Hill and Port Pirie were exposed to excessively high doses of radiation both external and through ingested radon and radon decay products. The standards are now higher but we contend that, because no account is taken of the downward trend in permissible doses, future generations will judge this generation as harshly as we have judged the previous one.

The effects of this trend have already been felt at Roxby, where workers were exposed to doses which a few years later were judged to exceed the recommended limit.

## 2.4 Health and Safety of the Community <sup>7</sup>

As with the previous section dealing with workers, major reforms are required, including:

- Expediting revisions on limiting exposure to ionising radiation.
- The composition of radiological protection committees.
- As with workers, the recommended maximum allowable exposure to ionising radiation has been steadily falling (Table 2.2 and Figure 2.3) and no provision has been made for this trend.

Table 2.2 Maximum Permissible Dose Rate for the Public.  
(Bulletin of Atomic Scientists, Sept. 1990).

Year	Dose Rate mSv / yr
1934	50*
1950	15*
1956	5
1960	1.7
1987	1

\* 1/10 of the dose rate for workers.

Figure 2.3 Semi-log plot of the Change in Maximum Permissible Dose Rate for the Public

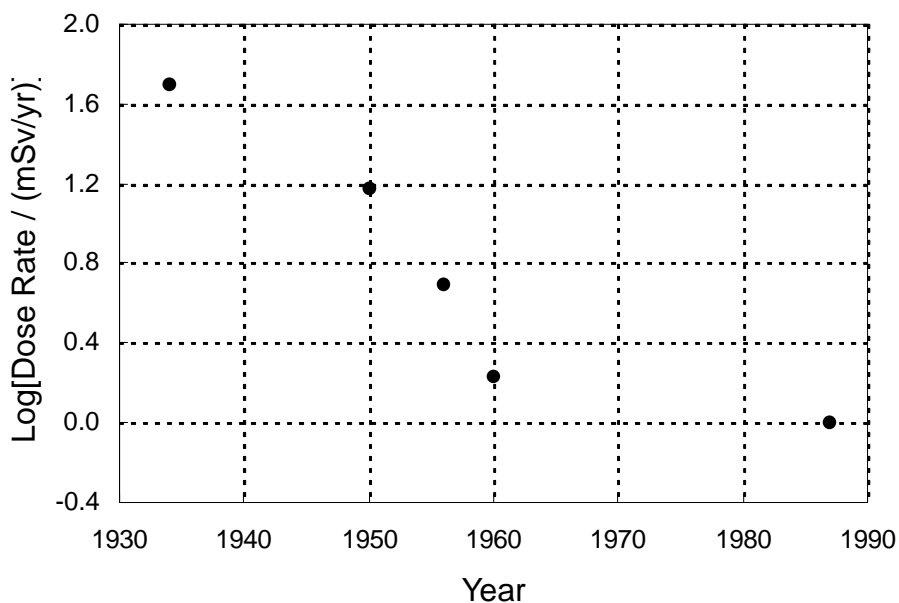


Figure 2.3 shows that the recommended <sup>8</sup>maximum exposure for the public has a half life of about 12 years. That is, on the average, the standard has been halved every 12 years.

Because of insufficiently rigorous safety standards many members of the public would have been exposed to excessively high doses of radiation both external and through ingested radon and radon decay products. The standards are now higher but we contend that, because no account is taken of the downward trend in permissible doses, future generations will judge this generation as harshly as we have judged the previous one.

### **3 The Jabiluka Draft EIS**

Time and resource limitations preclude us from commenting on all aspects of the DEIS. Lack of comment should not be construed as lack of concern.

#### **3.1 General Comments**

##### **3.1.1 The economic model**

Economic models, such as the AE-CGE model, used for computer simulations invariably involve severe approximations, assumptions and simplifications. In order to assess the validity and limitations of such models it is necessary to give a complete description including, assumptions, approximations, confidence limits, values of variables, and the sensitivity of the results and conclusions to these values. Little of this information is given in the DEIS (Appendix F) nor is any example given of a test of the model against empirical data. Hence it is difficult to take the results of the simulation seriously. The numbers generated are meaningless and therefore should not be included in the DEIS.

##### **3.1.2 The ALARA principle**

The DEIS makes frequent reference (pp 5, 14, 1-18, 4-56, 9-32, 9-33, 10-4, 10-12) to the ALARA principle but gives very little detail of how it will be implemented. The only detail given is that (p 9-32) “*improvements of existing control systems i.e. ventilation systems, and use of personal protective equipment is facilitated through use of the ALARA system.*”

Without concrete measures for implementing the ALARA principle the DEIS is paying only lip service to the principle.

##### **3.1.3 Exposure to ionising radiation**

Because of the large differences in dose rate that they are legally permitted to receive, it is important to distinguish between designated employees, non-designated employees and the public. Most of the time the distinction between the first two groups is unclear. From information given in the DEIS it appears likely that non-designated employees may be at risk of receiving higher than permissible doses of ionising radiation.

The average grade of the ore at Jabiluka is 0.45%, whereas that at the mine at Roxby Downs is 0.06%. The average dose rate for miners at Roxby is 3.6 mSv/a and hence we might expect an average of about 25-30 mSv/a at Jabiluka, but the value calculated for Jabiluka (p 9-28) assuming equipment and workplace shielding is only 8-12 mSv/a. The values obtained without assuming shielding (11-18 mSv/a) appear more realistic. The DEIS contains no apparent reason why the calculated value should be so low. Increased ventilation rates will help lower the dose rate but not down to 10 mSv/a. The draft DEIS should contain a test of the method of calculating dose rates, e.g. by using data from Roxby

##### **3.1.4 Medical records**

The medical effects of low doses of ionising radiation may appear in both the worker and the worker's family, including children conceived after leaving Jabiluka, and the effects may not

manifest themselves for some 20 years. It is <sup>9</sup>therefore essential that the EIS contain an assessment of this risk and measures to help future risk assessment. An undertaking to keep long term medical records of all employees should be included in the EIS.

### **3.2 Executive summary**

- 3.2.1 It is erroneous to say (p 1) that because radiation levels are well below international standards there is **no** health risk. Every level of radiation entails some health risk.
- 3.2.2 It is incongruous that items such as the amount received by the aboriginal community (p 2) and the location of the mine (p 3) are approximate, but that no such qualifying remark applies to the predicted GDP increase (p 2). Surely the location is accurately known but the GDP increase is approximate because it strongly depends on the details of the economic model used in its calculation.
- 3.2.3 Rehabilitation is predicted to make, in time, evidence of previous mining activity difficult to detect (p2). In the interests of accountability, a more accurate estimate of the time frame should be required.
- 3.2.4 The mine is expected to have a life of 28 years (p 3). Based on current trends (see our Figure 2.1) the maximum allowable annual radiation dose for workers is likely to be of the order of 5 mSv in 28 years time. No allowance has been made for this fact.
- 3.2.5 Bearing in mind that uranium is a fuel, intended by the proponents solely for the production of electrical energy, then an estimate of the energy payback time should be made based on the energy needed to produce the electricity (including uranium exploration, mining and processing) versus the energy produced by it.
- 3.2.6 It is not sufficient to state that the ALARA principle will be followed (p 5). Explicit details of actions taken to ensure adherence to the principle should be required. An ALARA target of 5 mSv/yr for workers would be appropriate.
- 3.2.7 The risks associated with ionising radiation are expressed as views or perceptions (p 10). This is a biased view which points to an inappropriate radiation safety culture.
- 3.2.8 In so far as the major uses of uranium are for either nuclear weapons or nuclear power then the project is contributing directly to these dangerous activities and they should be included in risk assessment and in cost-benefit analyses. An appropriate model is the asbestos industry. Because of the intrinsic dangers associated with blue asbestos, including its use and disposal, then any plan to mine the material must be done in the full knowledge of the consequences. The same applies to uranium.
- 3.2.9 Multi-skilling is used as a means of rotating workers through tasks so that they do not exceed 20 mSv/yr. This reduces the risk to individual workers but increases the overall risks from ionising radiation. Multi-skilling and rotation should be acceptable only if the overall risk is not increased. Overall risks are reduced by shielding, ventilation and air filtering.

### **3.3 Introduction**

- 3.3.4 The role of renewables (solar hot water, photovoltaic electricity) in reducing greenhouse gas emissions (p 1-17) should be included.
- 3.3.5 The contribution of the project to emissions of various greenhouse gases should be included (p 1-17).
- 3.3.6 Ecologically sustainable development (p 1-17) is global in scope. It therefore requires that the global ramifications of the mining, processing and use of uranium be assessed.
- 3.3.7 The fact that various community representatives were consulted (p 1-23) is in itself insufficient. The response of such groups including whether they were satisfied with the consultation process should be included. Without this information it is easy to give the impression that they were satisfied with the information they received and even that they had no problems with the proposal.

### 3.4 Background to the project

3.4.5 It is stated that the Ranger Uranium Environmental Inquiry (RUEI) “*remains one of the most comprehensive environmental investigations of a prospective mining operation ever undertaken.*” Considering that the RUEI occurred 20 years ago, and that the nuclear industry has suffered many reverses in the meantime, then there is a clear need for a new comprehensive inquiry. Like the Ranger project, **Jabiluka should not be allowed to proceed until a comprehensive inquiry of the nuclear industry is carried out.** The current Senate inquiry into the mining and milling of uranium could form part of such an inquiry.

### 3.5 Need for the project

3.5.1 The statement “*Uranium from Australia is only used to fuel nuclear power plants.*” (p 3-1) is not supported by evidence. The fact that Australian uranium has been and is being exported to countries which manufacture nuclear weapons (UK, USA, France), and that there is no way of separating Australian uranium from other uranium during conversion and enrichment means that the chances of Australian uranium being used for nuclear weapons is close to 100% certain.

3.5.2 The statement that the demand for uranium “*is primarily governed by world demand for electricity*” is erroneous. The demand is also strongly determined by the needs of the nuclear weapons manufacturers. We find it hard to believe that this fact and the one concerning the use of Australian uranium are not well known to the proponents.

3.5.3 The statement that (p 3-3) the “*more recent ABARE forecast is somewhat more optimistic.*” is inconsistent with the information presented in Table 3.1 of the DEIS, which gives a value of 0.6% for the annual change compared with 0.9 and 1.2% from other sources.

3.5.4 The economic modelling is said (p 3-7) to provide conclusions which should “be regarded as indicative, providing orders of magnitude of possible impact”. We tend to agree with this statement, namely that the predicted economic impacts are uncertain by a factor of ten, but not enough information is given about the economic model (Appendix F) to assess the outcome. We wonder about the usefulness of a process which estimates economic impacts with such a large uncertainty.

### 3.6 Project description - ERA proposal

3.6.1 A breakdown of radiation doses into gamma and radon/radon decay products contributions should be given (p 4-53)

3.6.2 The shielding effects of the various items (equipment, cabin, shotcreting) should be given (p 4-54)

3.6.3 Air conditioning does not necessarily reduce radiation exposure. Data should be given on the efficiency of air filtration as a function of particle size.

3.6.4 the word “*practicable*” (1st para, p4-56) should read “*achievable*”.

3.6.5 Do the drums contain yellowcake (Procedures, p4-91) or uranium oxide?

### 3.7 Alternatives to the project

3.7.8 The risks associated with ionising radiation are expressed as views or perceptions (p 5-2).

This is a biased view which points to an inappropriate radiation safety culture. The word “*perceived*” should be replaced by “*known*”, the phrase “*There is a view that*” should be deleted, and the phrase (para 3, p 9-4) “*often said*” should be replaced by “*generally agreed*”.

### 3.8 Radiation studies

- 3.8.1 In view of the information given in this <sup>11</sup>submission about the rate of change of allowable dose rates, the statement that “*The risks associated with exposure to radiation are well understood*” is unfounded.
- 3.8.2 There is a general lack of chronological information in this chapter. The years in which various recommendations and reports were issued should be included. This would show that the implementation of research results and recommendations has been very slow, especially the enactment of Australian legislation based on 1991 ICRP recommendations (p 9-1).
- 3.8.3 The statement (p 9-1) that “*the rate at which a radioactive element decays is described as its ‘half-life’*”, is incorrect. Rate of decay is measured in disintegrations per second (Bq) whereas half-life has the dimensions of time (units of seconds, minutes, or days).
- 3.8.4 Table 9.1 contains errors. The radiation dose range of 0-100s for medical uses doesn’t make sense.  
The average radiation dose of 1.5 mSv/yr and the range of 0.1-6 mSv/yr for uranium miners is at odds with data from the Olympic Dam project at Roxby Downs, which has an average of 3.7 mSv/yr. This is a modern mine with a low grade ore, 0.06% compared with 0.45 % for Jabiluka, so that its radiation doses should be at the low end of the range.
- 3.8.5 We find it unscientific to quote fatality figures to 6 significant figures (Table 9.4). No more than three is justified.
- 3.8.6 It should be mentioned that the latest ICRP recommendations (p 9-11) were made some 6 years ago.
- 3.8.7 It is not clear as to when the so-called ‘baseline studies’ were carried out (p 9-13). Were they done before the area was disturbed by exploration, drilling, and mining trials?
- 3.8.8 The term ‘members of the public’ also includes non-designated employees, many of whom will be spending significant amounts of time much closer to the radiation sources than people at Jabiru, Mudginberri and East Alligator River. Their radiation doses should also be calculated.  
It is not clear in the whole of this chapter whether the term ‘worker’ means a ‘designated employee’ or whether it means all employees.
- 3.8.9 The assumption concerning the use of air-conditioned cabins (p9-28) should be tested against experience at Roxby.
- 3.8.10 It is noted that the reduction from 18 to 12 mSv/a is dependent on the assumption of equipment and workplace shielding. This assumption should be tested with data from Roxby.

### **3.9 Overview environmental management plan**

- 3.9.1 Detailed management plans and protocols (p 9-35) should be part of the EIS so that they can be subjected to full public scrutiny at the time that major decisions are being made on the advisability of the project.
- 3.9.2 Bearing in mind the long delays that occur in making international recommendations (typically 4 years) and then approving these recommendations for use in Australia (typically another 4 years) we strongly urge that health physics recommendations (p 10-12) be adopted as soon as possible and no later than when they are internationally recommended, e.g., by ICRP.