



COMMONWEALTH OF AUSTRALIA

SENATE

SELECT COMMITTEE ON URANIUM MINING AND MILLING

ADELAIDE

Friday, 24 January 1997

OFFICIAL HANSARD REPORT

CANBERRA

SENATE
SELECT COMMITTEE ON URANIUM MINING AND MILLING

Members:

Senator Chapman (Chair)

Senator Margetts (Deputy Chair)

Senator Bishop
Senator Ferguson
Senator Lees

Senator Sandy Macdonald
Senator Reynolds

Matters referred for inquiry into and report on:

The environmental impact, health and safety and other implications and effectiveness of security agreements in relation to the mining, milling and export of Australian uranium.

In considering these terms of reference the Committee is to take into account, and where necessary report on, the following issues:

- (a) The environmental impact of uranium mining and milling in Australia and the effectiveness of environmental protection and monitoring in relation to existing and previous Australian uranium mining operations.
- (b) The role of the Office of the Supervising Scientist in monitoring Australian uranium mining and milling activities;
- (c) The health and safety implications of uranium mining and milling for workers at mining and milling sites and mining operations;
- (d) The health, safety and other effects of uranium mining and milling on communities adjacent to mine and mill sites and communities on existing or planned transport routes for uranium ore and uranium waste;
- (e) The effectiveness of Australia's bilateral agreements with countries importing Australian uranium in ensuring that Australian-sourced uranium is not used in military nuclear technology or nuclear weapons testing activities; and
- (f) The volume and location of Australian-obligated plutonium currently in existence in the international nuclear fuel cycle (produced as a result of the use of Australian uranium) in what form it exists (for example, separated or

in spent nuclear fuel) and its intended end use.

WITNESSES

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FATCHEN, Dr Timothy James, Consultant, Heathgate Resources Pty Ltd, General Atomics, Level 3, 45 Grenfell Street, Adelaide, South Australia .	993
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TRACY, Mr Lonnie Neal, Project Manager, Heathgate Resources Pty Ltd, General Atomics, Level 3, 45 Grenfell Street, Adelaide, South Australia .	993
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SENATE
SELECT COMMITTEE ON URANIUM MINING AND MILLING

Uranium Mining and Milling

ADELAIDE

Friday, 24 January 1997

Present

Senator Chapman (Chair)

Senator Bishop

Senator Lees

Senator Ferguson

Senator Margetts

The committee met at 9.17 a.m.
Senator Chapman took the chair.

CHAIR—I declare open these Adelaide hearings of the Senate Select Committee on Uranium Mining and Milling. The committee was established in May 1996 with terms of reference which specifically directed it to examine the environmental, health and safety and international safeguards dimensions of uranium mining and milling.

Since its establishment, the committee has received more than 100 submissions from a broad cross-section of the Australian community, which includes companies active in the uranium industry; government agencies responsible for the administration of policy concerning uranium mining; environmental, conservation and peace groups; shareholders of companies with interests in uranium mining; engineers and scientists.

The committee has already visited the Ranger Mine in the Northern Territory, the rehabilitated mines at Nabarlek and Rum Jungle, and the Environmental Research Institute of the Supervising Scientist. Our inquiry has been supported by a detailed research program embracing the roles and responsibilities of the Supervising Scientist, the impact of uranium mining on Aboriginal communities, the health and safety of employees in the uranium industry and the international safeguards system, especially as it relates to accounting for Australian obligated nuclear material.

During the past week we have had hearings in Perth, visited Cotton Creek near the site of the proposed mine at Kintyre in Western Australia and also the giant WMC mine at Roxby Downs, now on the verge of a new stage of expansion and development. South Australia is an especially important state in our inquiries. From Radium Hill in the 1930s to Roxby Downs as we enter the 21st century, it has had a central role in Australian participation in the nuclear industry—the most modern of all sources of energy. The committee's schedule is now very tight because the Senate has resolved that our report should be tabled no later than 31 March 1997.

I thank those in South Australia who have made the effort to make submissions, and especially those attending these hearings today to give additional evidence. Today we will be taking evidence from the Western Mining Corporation, the Chamber of Mines and Energy, the Conservation Council of South Australia, which has made a submission in association with the Friends of the Earth Nouveau and the Australian Peace Committee, and General Atomics.

[9.20 a.m.]

BRUNT, Mr David Andrew, Consultant, Heathgate Resources Pty Ltd, General Atomics, Level 3, 45 Grenfell Street, Adelaide, South Australia

FATCHEN, Dr Timothy James, Consultant, Heathgate Resources Pty Ltd, General Atomics, Level 3, 45 Grenfell Street, Adelaide, South Australia

TRACY, Mr Lonnie Neal, Project Manager, Heathgate Resources Pty Ltd, General Atomics, Level 3, 45 Grenfell Street, Adelaide, South Australia

CHAIR—Welcome. We do not have a written submission from General Atomics, so I will ask you to address the committee. At the conclusion of your remarks, members of the committee may have questions which they wish to put to you.

Mr Tracy—I would like to wish you all a good morning again. As I have stated, my name is Lonnie Tracy. I am the Project Manager for Heathgate Resources in Australia and for the Beverley project in particular. The primary reason that we are here today is to provide you with a briefing on Heathgate's proposed development of the Beverley project in South Australia.

I ask that you please bear in mind that this project is still in its infancy, both from a technical standpoint and relative to the presentation of the EIS. Our status at the current time is that of having been designated as a proponent and officially informed by both the state and the Commonwealth of the requirement for an EIS. We are at present awaiting issuance of the formal EIS guidelines.

Firstly, I thank you for the opportunity to make this presentation and, secondly, I would like to introduce you to the people who will be assisting me today. Mr David Brunt is our chief geological consultant for the project and Dr Tim Fatchen is our chief environmental consultant for the project. At this time, I would like to put up a brief schedule on the overhead.

Overhead transparencies were then shown—

I will begin for you by completing a summary of our background and basically relaying to you who and what Heathgate Resources is. This will be followed then by David who will give an overview of the proposed Beverley development and what in situ leaching is all about, after which Tim will review the environmental aspects of the project. I will return after that point to give you a wrap-up and basically conclude the presentation.

We would ask that you please, if you will, hold your questions if possible until our presentation is complete since some of the initial questions you may have could possibly be answered further on with the presentation materials that are being addressed.

CHAIR—That is the usual practice at committee hearings. When your presentation concludes we will have questions.

Mr Tracy—Thank you very much. Also, after we have concluded, I have brought a video and some other materials that we can leave with the committee that basically address the development proposed and the leaching process.

Heathgate Resources Pty Ltd is an Australian company which is owned by General Atomics. General Atomics is a California based US corporation which, along with its affiliated companies, is a diversified group specialising in high technology systems development and nuclear technology. As such, General Atomics has involvement in several areas of the nuclear cycle. These include the production and distribution of TRIGA training and research reactors on a worldwide basis; the development of gas cooled nuclear power technology in the USA; the marketing worldwide of uranium hexafluoride conversion services and the marketing worldwide of U308 and UF6; the operation of by-product disposal facilities in the US; the decommissioning of munitions from the former Eastern bloc; experience in the development, production and restoration of open pit, underground and in situ mining operations in the USA; a reserve base which includes, in addition to Beverley in South Australia, Mount Taylor in New Mexico which is the largest remaining reserve in the USA and, last but not least, operates one of the world's premier fusion research centres.

Heathgate was created in 1990 when the Beverley deposit was purchased, specifically to manage its development and any future acquisitions or ventures which General Atomics might consider in Australia. It was the first significant acquisition made by General Atomics following the decision to add a resources component to its operations and thus expand its involvement in the overall nuclear cycle. It was followed subsequently with the acquisition in 1991 of additional reserves and production facilities in the US through the purchase of all Chevron Corporation's uranium holdings.

At the same time a major marketing organisation was established in order to administer multiple international fuel contracts with major utilities. Since the acquisition of Beverley in 1990, and until recent changes in the Australian government, which included the relaxation of Australia's three-mine policy and changes in the perception of world market projections, Heathgate had essentially maintained a caretaker position. Several members of the General Atomics management team, however, had been keen to develop a new production operation and in late 1995 and early 1996 we were engaged in a worldwide evaluation of potential acquisitions and existing in-house resources having near term production capability. In May 1996 it was decided that Beverley in South Australia was the best candidate, having the right combination for both short-term development, moderate production costs and long-term productivity. In June I was sent to Adelaide to review the project and establish residence with the intent to advance Beverley on an optimum path to production.

At this time I would like to turn over the presentation to David and let you see what the development plan has been.

Mr Brunt—I will address the proposed development at Beverley under the headings shown on the presentation outline. Similarly, I will address the in situ leaching process under those headings.

Firstly, objectives: Heathgate Resources plans to construct and operate an in situ leach uranium mine at Beverley. The proposal involves construction of wellfields, the uranium extraction plant, a low-temperature dryer plus camp, airstrip and associated facilities to produce approximately 450 tonnes of uranium per annum—that is approximately one million pounds per annum—from the year 2000. Probable mine life would be 20 to 30 years or reduced from this if production is expanded. Mining operations will provide about 50 full-time jobs with crews flying in and out of the site from Adelaide. As well as generating direct and indirect employment, other benefits such as income tax, payroll tax, mineral royalties and company taxes will accrue to the state and Commonwealth governments. Uranium will be exported under contracted arrangements fully in accordance with government policies, legislation, and codes of practice controlling the production, transport and sale of yellowcake.

The project site, as shown on the overhead, is located near Lake Frome, approximately 530 kilometres north-north-east of Adelaide and approximately 300 kilometres north-east of Port Augusta. It is located some 20 kilometres outside the Gammon Ranges National Park and approximately 10 kilometres from the Arkaroola private sanctuary.

History of the project: uranium mineralisation was first detected in 1969 by the Oilmin Transoil Petromin Group. Detailed investigations carried out under joint venture with Western Uranium Ltd resulted in the discovery of Beverley in July 1970. Intensive drilling followed in the 1971-72 period and this was closely followed by metallurgical and engineering studies directed towards a conventional open pit operation. However, uranium policy and market influences caused the project to be wound down and shelved in June 1974. Renewed interest in 1981, under South Australian Uranium Corporation, began with technical and environmental investigations as to the amenability of the uranium deposit to be mined by the then relatively new in situ leach uranium extraction technology.

A draft environmental impact statement was released but changes in government policy in 1983 and deteriorating uranium markets led to shelving of the project again in mid-1985. A final environmental impact statement was never completed. Heathgate Resources acquired the property in 1990 and initiated new investigations of in situ leaching using recent US experience.

Uranium resource: a defined resource of approximately 5.2 million tonnes and an average grade of 0.27 per cent U308—that is approximately 11,000 tonnes of contained

uranium oxide—has been outlined in three main ore lenses within consolidated and uncemented sands and clays of the Tertiary Namba Formation. The location of the lenses within the mineralised trend is shown on this overhead.

The ore occurs at depths of 110 to 140 metres beneath the surface within a confined aquifer that is isolated from other ground water aquifers in the area. Great Artesian Basin aquifers are present vertically beneath the Beverley aquifer but are separated from it by over 300 metres of impermeable, plastic clays and silts. Uranium is present as coffinite veneer or coating on sand grains within the Beverley aquifer. Coffinite is a uraniferous hydrosilicate mineral which can be readily dissolved by carbonate and sulfate leach systems in the presence of oxygen. Uranium is believed to be derived from the known occurrences in older rocks within the northern Flinders Ranges approximately 10 kilometres to the north west. The deposit is held under retention leases issued under the South Australian Mining Act. The boundary of those retention leases are shown on this diagram.

The surrounding area is within exploration licence No. 1944. It is located on Wooltana pastoral lease. Aboriginal interests have lodged two competing claims over broad areas, including the Beverley site, in accordance with Commonwealth native title legislation.

Current programs: as much of the earlier technical work was oriented towards open pit investigations, additional work specifically towards in situ leaching is required. The current program involves core drilling to obtain samples for greater understanding of the deposit's geological and metallurgical characteristics, and as well an assessment of the in situ resources amenable to in situ leaching. Additionally, baseline environmental work towards an environmental impact statement has commenced, together with consultation with Aboriginal and community groups. Prior to mine development, work will include pump testing, hydrogeological studies and operation of a field leach trial.

I would like to now turn to a brief and general description of the in situ leaching process. In situ leaching—or ISL for short—has been used successfully in Europe, Asia and the United States to mine uranium for over 25 years. Currently, 13 per cent of world production is by in situ leaching and almost all of the US production is by that method, apart from some uranium produced in by-product operations. The techniques for in situ leaching have evolved to the point where it is a controllable, safe, environmentally benign method of mining which can produce uranium with low capital and operating costs and can operate under strict environmental controls.

As shown on the overhead, ISL is a closed loop mining system, where ground water from the aquifer is utilised as the transport medium. Uranium is dissolved in situ within the host formation generally using oxygen as an oxidant and with either carbonate or sulfate leach chemistry, depending on the chemistry of the ore and the ground water. Patterns of screened and cased water bores or wells are used to deliver the reagent stream

to the ore horizon—as shown here—enabling it to contact the uranium mineralisation whilst passing through the aquifer. Similarly, patterns of recovery or extraction wells fitted with submersible pumps deliver the fluid to the surface for processing to recover the dissolved uranium. After processing, the fluid is returned to the wellfield to continue the leaching cycle. Thus, ISL takes place on a continuous basis.

Limiting the reagent stream to within the ore body is achieved by careful wellfield planning, by excess pumping of extraction over injection to create a zone of depression centred on the mining activity and by routine monitoring of monitor wells located outside the ore body. ISL operations have a number of advantages over open pit and underground mining. By comparison with open cut and underground mining, there is minimal surface disturbance.

ISL mines consist of wellfields, pipelines, a compact and simple uranium extraction plant and drying facilities. There are no open pits, shafts or tunnels, nor grinding, crushing and ancillary features, nor ore and waste rock heavy earth-moving equipment. The extent and visual impacts are reduced. There are no tailings. As ore is not crushed or ground, there are no long-term tailings dams nor waste rock piles. Small evaporation ponds only are required. Operational surface water and long-term restoration requirements are significantly reduced. Limited solid wastes can be easily managed. There is no ore exposure. As ore is left in situ, radon release is reduced and dust generation is insignificant. Material handling requirements are safer and underground mining, cooling and ventilation problems are non-existent.

There is reduced radiation exposure. Reduced dust and absence of exposure to the ore enables greatly reduced radiation exposure to both workers and the public at large. The lower impacts require reduced rehabilitation requirements. Upon completion of mining, wells can be sealed and capped, process facilities removed and the surface returned to its original contour and vegetation.

Reduced labour inputs: ISL requires a smaller work force per unit output and therefore local social impacts are reduced. The technology enables smaller ore bodies to be mined. The ore bodies may be smaller and lower in grade, narrow and otherwise uneconomic.

Whilst Beverley has a number of key characteristics typical of US deposits and operations, there are a number of differences. These are summarised in this overhead. I draw your attention to a number of matters. Firstly, the relatively high grade of the Beverley deposit and the low calcite content favour an economically attractive sulfate leach process. In respect of the aquifer characteristics, US mines are typically in broad aquifers with low salinity and low radioactivity, thereby usable for stock or human consumption. Beverley, however, is in a confined aquifer with high salinity and high radioactivity, thereby being unusable for any purpose other than uranium mining.

The chemistry of the ore and the ground water at Beverley favours a sulfate leach ISL system with recovery by either ion exchange or solvent extraction. Both of these are common metallurgical processes. After mining, the Beverley aquifer will still be unusable for any other purpose. The remote semi-desert location of Beverley contrasts with the existing US mines and requires additional infrastructure, including a camp, an airstrip and on-site power generation, and a number of alternatives to this are being considered. These infrastructure requirements add significantly to the capital and operating costs of establishing a mine at Beverley by comparison with existing US operations.

Visually, ISL mines are significantly different from conventional mines. They consist of a processing plant, evaporation ponds and wellfields. The plant being the most visible is normally of a size not much different from a large woolshed. I have now some illustrations of existing mines in the United States. Firstly, this Kingsville Dome mine in South Texas produces approximately 500 tonnes of uranium per annum and is located just outside the town of Kingsville and, as you can see in the picture, crop farming takes place right up to the boundary of the mine.

Similarly, the Crowe Butte mine in western Nebraska near the town of Crawford also produces approximately 500 tonnes of uranium per annum, again in an intensely farmed area. You can see the local farm facilities and farmed areas in this particular photograph.

Finally, at Christensen Ranch in northern Wyoming, the mine again is of similar size to the proposed Beverley mine. It is located in a low rainfall area and in an environment somewhat similar to Beverley. You can note again farming activity and some wildlife in the foreground. That concludes my part of the presentation. I would now like to hand over to Dr Fatchen to talk about environmental matters.

Dr Fatchen—Thank you, David. The level and significance of the environmental impacts and the extent to which avoidance, amelioration and rehabilitation are possible are going to be strongly influenced by the mining and processing methods used, by the biophysical setting of the operation and by the cultural setting of the operation. There are a number of points relating to in situ leaching which should be further emphasised because these affect the whole nature and significance of possible impacts and their amelioration or management.

By using in situ leaching rather than open cast or underground mining, the impacts are reduced. The amelioration of impacts, the environmental management and site rehabilitation are all simplified. This is not to say that there are not any impacts, rather that their scale and extent are much smaller than is usual with alternative methods.

In situ leaching does not require a pit or shaft, so there is no hole in the ground and none of the rehabilitation problems associated with pits. There is no disruption of aquifers. There is no need for overburden stabilisation and treatment. No artificial

landform is created. There is no permanently visible change to the terrain—especially, soil resources can remain intact. There are no oil stockpiles with their demands for land and containment. There are none of the other problems which come with overburden or stockpiles mentioned by David. Leaching, omissions, dust, occupational health problems, handling and exposure to stockpiles are not there. There is no pit or mine dewatering.

The problem of just how one handles disposal of contaminated water from mine dewatering simply does not arise. Again, there are reduced occupational health and safety problems, apart from simple environmental ones. Mine ventilation is not needed, and its associated problems—particularly dispersion of ventilation exhausts—are avoided. Again, there are occupational health benefits.

It is important also to see the Beverley proposal in its proper scale. It is small and the facilities would match this. It does not entail metal smelters or refineries. The mining and processing infrastructure needed is modest. There are no ore tailings. The water demand is small: on present estimates, under one megalitre per day. Probable mine life is relatively short—20 to 30 years. A fly-in, fly-out operation is proposed, but needs can be met with a small local camp. We are not talking a major township.

I am only going to touch on the biophysical setting itself very briefly. We have all already had extended visits in the arid areas. This is very similar in a lot of respects to all the places we have seen. I would be quite happy to expand in questions after but, in view of time, I am going to do this very rapidly.

On present information, there are no special characteristics of the Beverley site and its surrounds which totally preclude development. There are characteristics of the site which require care and design in construction and operation. It is in an arid area and mean annual rainfall is about 260 millimetres but it is highly variable.

The actual deposit is under outwash plains flanking the northern Flinders Ranges. The site and surrounds have landscape and biological elements of two broad land groups which together cover some 4,000 to 5,000 square kilometres of that landscape—the outwash plains between Lake Frome and the Flinders Ranges. We are dealing with landscapes which are extensive and a site which is not unusual, neither locally nor regionally. The main characteristics are: low relief, gentle slopes and plains and a dissection of the plains by major streams flowing from the Flinders Ranges.

As an indication of the actual appearance of the site, both of these are on the proposed mining site. In the lower photograph is a major stream coming from the Flinders Ranges with red gum. In the foreground of both photos is Mitchell grass grasslands. There are two points that are relevant to the significance of impacts and subsequent rehabilitation of this area. There are indications of a past history of extremely heavy grazing—and I mean extremely heavy grazing—primarily in the 19th century. It is certainly not a pristine site.

There is now little trace of the extensive drilling operations—some 1,000 drill holes in and around that area—of the late 1970s. The implications are that we have a resilient biological community, and the recovery from the 1970s operations, which I do not believe had anything done other than the exploration. They both point to the relative simplicity of remediation at the end of the proposed mine's life. At a point of in situ leaching operations, even though there is surface impact, the soil profiles are still going to be there at the end of the mine's life.

Ground waters have already been partly mentioned. There will be a need to draw on the Great Artesian Basin. The water demand is being investigated as it will be affected by the processes. But, on present information, the requirements are under one megalitre per day. This is somewhat more than the single pastoral bore next to the site can supply. Its flow rate is about 0.4 megalitres per day. Local repercussions at this level of extraction will be minor. To put it into context, one can compare it with other existing uses in the GAB. The projected plot for Beverley speaks for itself.

The major land use on the site is pastoral lease. Within the ranges, there are Aboriginal lands associated with the Nepabunna community and extensive conservation areas, as has already been mentioned. The regional infrastructure, however, is minimal.

Transportation routes: there are several alternatives for the transport of product from this site. The preferred route is via Yunta, the Barrier Highway and across the plains. The reason for this being a preference is that it avoids movement of products through the Flinders Ranges. It particularly avoids, as much as possible, going through park area, going through Aboriginal lands and, especially, going through areas of the Flinders Ranges that are used as major tourist destinations.

On matters of radiation, public health and occupational health and safety, Heathgate is still assessing these topics because of their close dependency on design and operational aspects. Operations will meet with the extensive legislation and codes of practice supplied by both the South Australian and Commonwealth governments. The procedures, the systems, controls and monitoring are being developed as part of both design and EIS preparation.

In relation to radiation, it is worth pointing out that this is a radioactive province, especially the Paralana hot springs, which are fed not by the Great Artesian Basin but by the Flinders Ranges, and are some 15 kilometres or so from the mine site. They are hot springs in several respects. The warmth of the water and the bubbles, which, in the past, have led to attempts to start health spas and, in the present, still provide a major tourist attraction, arise because the water comes out of the Mount Painter uranium province.

The bubbles themselves are primarily helium with considerable amounts of radon. The sediments and waters of the Paralana hot springs have quite high concentrations of radioactive uranium, radium, thorium, lead, polonium and a number of others. Numerous

other radioisotopes are present and you can find enhanced levels of radioactivity downstream from the ranges—not just from Paralana springs—for at least 40 to 50 kilometres.

On the cultural aspects, the Beverley site is the subject of competing native title claims, so a great degree of sensitivity is needed. Heathgate is communicating with both claimants, for example, for clearances with current programs, and will continue to do so. Formal agreement has been reached with both claimant parties to enable all current assessment work to proceed. The agreement has established an advisory committee to foster ongoing communication. The agreement also provides for mutual discussion and resolution of concerns and provides for the negotiating of further agreements relating to eventual development and production.

Heathgate will be commissioning archaeological surveys and anthropological studies as part of baseline planning. Heathgate is now well embarked on developing an appropriate baseline, which is being commenced prior to the formal issue of guidelines, so that environmental constraints can be built into the mining and engineering design from the start rather than the unfortunate all too common practice of bolting on the environmental constraints at the end of development planning.

The current environmental work cannot and will not be a rehash of the 1982 EIS, which was never finalised in any case. That EIS was a product of another day and age and perhaps also another set of attitudes and was not up to Heathgate's standards. Any questions on the biophysical side, which is interesting but perhaps not germane, I would be happy to deal with afterwards.

Mr Tracy—If you would, Tim. I will go ahead and just wrap things up. Basically, I would just like to make a few brief statements in conclusion. First, for reference, Beverley is the second largest uranium deposit in South Australia. By comparison with Olympic Dam, it is significantly smaller. It has no associated minerals of economic value, and it is of limited aerial extent. It is, however, a higher grade deposit relative to uranium.

Secondly, Beverley is particularly suited to the ISL, in situ leach, mining technology. This is basically evidenced by the sinuosity and the depth of the mineralisation and by the location of the ore body within a confined aquifer. Heathgate Resources Pty Ltd plans to build a new and environmentally responsible, low cost ISL uranium mine at Beverley by the year 2000.

I would like to state that it has thus far been Heathgate's experience that the state and Commonwealth have worked extremely well together. Certainly, this has been the case in establishing the procedures to be followed in the preparation of our EIS. In our specific instance, a joint effort has been authorised for the EIS process and the state has been designated to act as the lead agent.

Heathgate believes the ISL process to be a sound and viable mining alternative. The company further believes that the process can be managed responsibly through sound planning, both technical and environmental, which will be confirmed through a monitoring program, and that it has the appropriate expertise, policies and background necessary to ensure that the project succeeds.

CHAIR—Thank you very much, Mr Tracy and your colleagues, for your presentation. I will ask a couple of questions to start with. As I recall, you said it would result in the production of 450 tonnes per year of yellowcake.

Mr Tracy—Roughly a million pounds a year, yes.

CHAIR—Over a period of 20 to 30 years?

Mr Tracy—Correct.

CHAIR—That is on the proven reserves?

Mr Brunt—One of the current programs is a better assessment of the resources within the deposit that are amenable to in situ leaching. Until we know the answers to that, we will not be able to predict the ultimate mine life. But that is the order of magnitude.

CHAIR—You indicated a moment ago that that is significantly smaller than, for example, Olympic Dam.

Mr Tracy—Indeed.

CHAIR—In world terms, where would it rank—also relatively small?

Mr Tracy—It is definitely a world-class deposit from the standpoint that it has the potential for 20-plus years of life, even at a million pound production. The average size of the deposits in the US, for example, are not more than two to three million pounds. They are very small. Our primary resource in New Mexico in the US, which is an underground deposit, is essentially the largest remaining US deposit, and it is somewhere between 100 and 150 million pounds. It is quite large. But most in situ operations are in the range of a few million pounds.

CHAIR—Is it the in situ technique that makes it economic at that scale of production, or would it be economic as an open-cut or a pit mine?

Mr Tracy—Beverley probably would be economic, depending on development cost, as an open-cut mine as well as an in situ operation. However, the in situ technology makes it much more attractive from a mining standpoint overall, because the economics

should be considerably better than conventional methods because of the fact that you have much less capital investment involved.

CHAIR—What sort of employment would you envisage being generated, firstly in the establishment phase of the mine and, secondly, in the ongoing operational phase?

Mr Tracy—During the establishment phase, between now and when the actual process plant would be completed, there would be mostly employment through the involvement of consultants and personnel with various high technology organisations in order to provide the work necessary to answer the question as to viability in an ultimate sense.

Then there would be those construction organisations that would have employees who would be involved in the actual construction of the facility. Once the operation is actually under way, we would have permanent employment in the neighbourhood of 50 employees. But, essentially, that would also involve the normal multiplier which you see in these things where probably as many as 150 people would be affected from the overall operation.

CHAIR—And what sort of investment is involved in bringing it to production stage?

Mr Tracy—I cannot totally answer that question at this point, but it is in the neighbourhood of \$20 million.

CHAIR—You referred to the aquifer that is involved in which the uranium is concentrated and which is also used as part of the process. I think you referred to it as a high salinity, highly radioactive aquifer.

Mr Tracy—Correct.

CHAIR—Is that an isolated aquifer?

Mr Tracy—Yes, it is.

CHAIR—There is no way that that aquifer can move its contents into other parts of the Great Artesian Basin?

Mr Brunt—No. It is separated from the Great Artesian Basin by 300 metres of impermeable clays. It is completely separate. It is isolated in its extent, and it is confined vertically as well.

CHAIR—So, both in its current natural state and also in the mining process, there is no danger of any radioactive water or whatever getting back into the Great Artesian

Basin?

Mr Brunt—There is absolutely no chance of the mining process polluting the Great Artesian Basin. If, for any reason, the two aquifers were connected, because of the hydrostatic head in the Great Artesian Basin, water would flow from the Great Artesian Basin into the Beverley aquifer, not the other way around.

CHAIR—You also mentioned that, subject to a native title claim—

Mr Tracy—Correct, there are two.

CHAIR—Two competing claims, but it is on a pastoral lease.

Mr Tracy—Yes.

CHAIR—I assume the claimants do not accept that pastoral leases extinguish native title.

Mr Tracy—No. And it is certainly not our position to question that at this stage. We felt that it was totally appropriate to try basically to come to an accommodation with both organisations until it is established what the actual native title situation is.

CHAIR—Are you going to add to that?

Dr Fatchen—I would simply say that the question of who is the appropriate claimant is an Aboriginal question. Heathgate has no wish to be influential in any respect.

Senator MARGETTS—In your original presentation you mentioned that the environmental impact statement in the early 1980s was discontinued. I notice that you have distanced yourself from that original environmental impact statement, but is it not the case that the original environmental impact statement was rejected by state and federal environmental authorities as inadequate, and that the operating licence was refused in 1983?

Dr Fatchen—My understanding is that the draft EIS was published and submitted, that there were serious and major questions from the state and Commonwealth governments on that draft, and that the preparation of a final EIS purporting to answer those questions was commenced, but the process was never completed. As the process was not completed, I do not think one can say that it was rejected.

Mr Tracy—I would like to add to that. Even so, that was an effort that was put together by a totally different organisation whose culture I would say has nothing to do with Heathgate's culture.

Senator LEES—Who is doing the environmental impact statement now?

Mr Tracy—It is Heathgate Resources.

Senator LEES—You are doing your own environmental impact statement?

Mr Tracy—Yes.

Mr Brunt—Let me add one point to your question about rejection or that the mining project operating licence was refused. The process was that the environmental impact statement was as Tim indicated, but events in terms of the decision by the South Australian government at the time and in terms of federal policy at the time to do with uranium mining overtook it. So an operating licence was never actually refused.

Senator MARGETTS—In the general context, did this committee contact you or did you contact the committee in relation to your coming to give evidence today?

Mr Brunt—I think the committee contacted us.

Mr Tracy—Yes, we were requested by the committee to give you a briefing.

Senator MARGETTS—Do you know around about what date that was?

Mr Brunt—From my recollection, it would be approximately a couple of months ago.

Senator MARGETTS—It would have been extremely useful in the light of your presentation and the importance of the issues if we had something in front of us to see so that we had some ability to ask more prepared questions. Why was this not done?

Dr Fatchen—Mr Tracy said earlier in discussion that this project is in its infancy. At the stage when the first notification or request came, Heathgate and its associated consultants were still in the stage of preparing basic outlines for the first step in the EIS process. We are still in very early stages with this. A couple of months ago if we had presented some material we may now be saying quite different things simply because our knowledge has increased and the project has progressed.

Mr Tracy—Indeed, I would reiterate the fact that we are still waiting for our formal guidelines for completion of the EIS.

Senator MARGETTS—You might be aware that in Australia in situ leach processes have already been trialled at Honeymoon, and that is relevant, in particular, to today's hearing because that is also in South Australia. It appears that at the time the process was that corrosive liquids were injected into the oil-bearing strata with the aim of

dissolving the target minerals, which were then brought to the surface through pumps. The mining trials were discontinued—by, I presume, the South Australian government—after it was found that blockages which affected the ability of the operators to control the movement of the leached solution had occurred. Have there been similar problems in blockages in the processes in the United States for in situ leaching?

Mr Tracy—There have been a multitude of technological advances and difficulties and resolutions to those difficulties over the past 20 years in the US, so I would say there are no problems that would be, or could be, anticipated in South Australia that had not been addressed previously in some other type of an operation.

Mr Brunt—Could I add that in reference to Honeymoon, because I was involved in that project, that the Honeymoon pilot plant was built at the Honeymoon site in 1982. The actual plant itself was never operated. It was never commissioned because of the decision of the South Australia government at that time, as I referred to earlier, to reject the opportunity for the project to go ahead with a production or a testing licence.

At the same time the policy on uranium mining, both state and federal, was changed. The reference in those notes that you have refer to a very small test that was done on one particular part of the ore body where some metallurgical characteristics of the deposit were identified, but that particular process was an interim process prior to operation of the pilot plant.

It is true to say that on a medium scale there have never been any in situ leach operations in Australia. There have been individual tests at Honeymoon, Beverley and other places but never a full plant of the size that I have showed you on the photographs.

Senator MARGETTS—We have heard considerable information from people in relation to underground aquifers and one of those—and I have to refer to other mines because obviously that relates to what we might project into the future—was that, for instance, the draw down of water from wellfield A from Roxby Downs was guaranteed, if you like, not to affect wellfields or mound springs outside that area and there was sort of like a physical boundary considered to be an impermeable barrier which would not affect mound springs outside that area, and yet there was a draw down from mound springs outside that area. How can you be more sure of your information about the impermeability of barriers and the isolation of underground aquifers than perhaps Roxby Downs and Olympic Dam mine were in relation to wellfield A?

Dr Fatchen—I will just use an overhead for this if I can find the appropriate one.

Overhead transparencies were then shown—

Dr Fatchen—The first thing is the scale of extraction that we are talking about, which is small. One megalitre a day is a lot less than the projected 45 megalitres per day

and it is on a par with pastoral bore production in this area. The individual pastoral bores into the GAB around the mine site itself, or the proposed mine site, deliver about half a megalitre per day. What we are talking about is one more pastoral bore in the region.

The second point is the location in particular of the mound springs. The small triangles are the approximate areas of Beverley, wellfield A and wellfield B for the Olympic Dam operation. As well as drawing a very small amount relatively speaking, we are also distant from the springs by some 30 to 50 kilometres, depending how one measures from here to the nearest in Lake Frome, and a further distance to groups on the top of the north Flinders Ranges.

In terms of contamination, please bear in mind that this aquifer is highly radioactive. It is not simply uranium; it is radium as well, as is the Paralana hot springs. But the GAB water underneath is not. There is a vast difference between a solid clay blanket 300 metres thick and perhaps a two- or three-metre thick clay layer as one puts on, for example, tailings ponds.

Senator MARGETTS—With all due respect, Dr Fatchen, the draw down of water is different from a situation in the community's mind of putting, if you like, corrosive chemicals under the ground where people from the community have little ability to actually see where there might be problems and sometimes, as we have seen with Roxby Downs, problems might not be detected for years after they are occurring and then it is quite different from simply drawing out water to actually putting in corrosive liquids underground, which will perhaps make that uranium more available to the water system in different ways, and also other chemicals into the water system, than were there before.

Dr Fatchen—Yes, the concern is quite understandable. I will pass to David to explain further the means by which monitoring is done in the United States especially, which is our best example.

Mr Brunt—This aquifer is not a usable aquifer. In the United States, existing operations take place with this type of mining in areas where the water supply is used for both stock purposes and, in some cases, potable water for human consumption. And you can see instances where there are mines and water bores not too distant away that are used for these purposes.

In the Beverley case, the aquifer has high salinity and high radioactivity and is just not usable for anything else. The process of in situ leaching has the controls built in, monitoring wells around the outside of the deposit, so that if there is any leaching outside the actual area of the ore bodies they are detected and corrected.

The other process is that there is a net excess of production over injection—what they call a bleed—of one to three per cent level, so that ensures that ground water in the surrounding areas flows into the mined area and, therefore, containing the solutions.

Senator LEES—Just a question regarding the environmental impact statement. As you are developing your environmental impact statement, what plans do you have for monitoring? Who will be doing the monitoring, for example, of those other bores that you had around the mine site?

Dr Fatchen—It is perhaps too early to say who specifically will be doing the monitoring. Heathgate itself will have effectively a statutory responsibility to monitor. There is some monitoring in place already, especially in relation to climatic on the surface, which will feed into the surface radiation, some set-up for general landscape and part of present programs are to first get particular characteristics of the ore bodies so that effective monitoring can be designed before work cuts in.

Senator LEES—So you are doing all that work at the moment?

Dr Fatchen—Are you asking me personally?

Senator LEES—I am asking: is the company doing that work at the moment?

Dr Fatchen—Yes.

Senator LEES—And so the company will be doing its own monitoring?

Mr Tracy—Yes.

Dr Fatchen—I do not envisage—

Mr Tracy—I do not know why not.

Senator LEES—Thank you.

CHAIR—That concludes our questions to you. Can I on behalf of the committee thank you for your attendance at the committee this morning and the way in which you have presented and answered questions. If there are any further issues arising in the committee's deliberations that we want to raise with you, we will do so in writing and seek a written response. Thank you very much.

[10.17 a.m.]

GRAY, Mr Ronald Edward, Treasurer, Australian Peace Committee (South Australian Branch), 11 South Terrace, Adelaide, South Australia

CHAIR—The committee has before it your submission, which we have numbered 39 and which will appear in a separate volume. Mr Gray, do you wish to make an opening statement?

Mr Gray—As a peace committee, we realise that the companies involved in mining and milling will have their representatives and other groups with expertise, such as the doctors and scientists, who are in opposition will provide the technical expertise, the knowledge, of the hazards that the companies do not present us with. So we are looking not at the direct effects of the mining and milling but at the after-effects in that we see that the main problem of the use of uranium and transposing it into plutonium is: what do we do with the material when we finish with it? It is certainly not something that we leave lying around and forget about.

We have evidence—and I am sure the committee has seen these instances—of what is taking place in the companies that use uranium, the military that are downsizing the nuclear forces, in that they have not really come to grips with the reasonable method, the responsible method, of containing the wastes, of neutralising the wastes, of making things safe for generations to come.

We talk about plutonium, which has a half-life of 240,000 years. Our recorded history is about 5,000 years, and in that time we have lost cities, we have lost whole societies, and we are very careless in what we do. Are we leaving something there for people to look after for 240,000 years when we have no history of responsibility ourselves?

With that history of the neglect, I have one about the Marshall Islands, looking at just dumping waste on the Marshall Islands. Even worse, Kiribati has been asked by an American company to have waste on an island that is about 12 square kilometres and an elevation of about two metres. Is that responsible? It is like dumping it straight in the sea. So that is our objection to the continued use, especially the military use, of uranium and the products of it.

Looking at the experienced countries who have been using this material, it is quite obvious that they are looking at various problems with this. It is significant that the US nuclear reactor status is that they have 110 nuclear reactors, but there is none under construction and there is none envisaged. In Africa, they have got two but no more. In Western Europe, there are 94 stations but none ordered, none envisaged and none under construction. It seems that the experienced people, those who have experience of it, are

deciding they can do better elsewhere with other materials, other ways of generating power.

But we see that in Asia there are stations under construction. To keep the business going, to keep the industry running, we are trying to force on the developing nations something that the Western world, the developed world, has decided is too dangerous to use. It has always been difficult to get to the economics of nuclear power—because really, as we see it, the only thing that has made it in any way bearable economically is the developing of nuclear weapons; and I think that is why the western nations are no longer interested in it. They see too many problems and it cannot be economic.

Looking at the comparisons of the dangers with nuclear as opposed to fossil fuels and other forms of use for materials for developing energy, the potential consequences of catastrophic accidents with breeder reactors are severe long-lasting effects over a large region; and, with nuclear once-through uranium use, severe long-lasting effects over large regions. Chernobyl is a classic example of that, and so is Three Mile Island. There are no such consequences for using fossil fuels and other renewables. Water pollution is potentially serious at mines and mills, but is limited due to low uranium requirements; it is potentially serious at waste disposal sites. I was listening to the earlier submissions. That is for those breeder reactors where they use less fuel.

Where there is once-through uranium use, the consequences are often serious at mines, mills and uranium processing plants—and that includes radioactive and non-radioactive pollutants—and they are potentially serious at waste disposal sites. And we all know that that happens. And, of course, there is the risk of nuclear weapons programs, which are the only thing, we believe, that has made the whole thing economic in any way. With the downsizing of the nuclear weapons industry, it is a different problem. Basically, that is our objection to the use of it.

We know that there are different ways of using nuclear fuels. We know that they are experimenting with the use of mixed oxide fuels as a way of getting rid of some of the plutonium. It is interesting again that the US, which wants to experiment with this, wants Canada, and not the US itself, to burn it. With all these things it seems that the countries that have the experience, whether they have told us all their experiences or not, are moving out of the nuclear industry. There was a time when the US expected an installed nuclear capacity of one million megawatts by the year 2000; however, US capacity is now only 20 per cent of those projections, at about 100,000 megawatts, and will not increase by the year 2000. So they are having second thoughts, and I agree with them.

The theoretical arguments in favour of breeder reactors will provide inspiration to nuclear establishments all over the world; but technical, economic, political, environmental and military realities have all combined to make a plutonium based energy system economically impractical, environmentally dangerous, diplomatically difficult and militarily risky. So, with those factors in mind, those are the things that concern us.

We believe that we are jumping into the mining and milling of uranium at a time when actually the whole system is declining, and we will have to start virtually giving the stuff away. The price has already gone down alarmingly—although not alarmingly for me—and that has made it very difficult to make mining and milling economic. As I say, there are problems that arise from waste products, and it is only now that they are trying to decommission nuclear power stations that they are finding the decommissioning of stations extremely expensive. It was a cost that was never factored in to the original cost of nuclear power. Britain found when they had nine to decommission that the whole system was not worth a candle.

We see them trying to get rid of the nuclear waste in irresponsible ways. They are trying to dump it in the Pacific; they are giving the depleted uranium to arms manufacturers to make armour piercing shells—anything to get rid of it. The arms manufacturer has got that depleted uranium free—from all the reports that we have managed to read. It is an irresponsible way of trying to get rid of the problem that has been created, and we think it is time it was stopped. We think it is time that, instead of mining more uranium, we should be looking at ways in which we can contain the problem we have already created.

CHAIR—Thank you, Mr Gray. Does the Australian Peace Committee conduct its own primary research, or does it rely on researching other reports as secondary sources?

Mr Gray—We do a bit of each. In the major technical areas we do rely on people with more expertise. Ours is not a specialised group like the Medical Association for the Prevention of War, or the Scientists Against Nuclear War. We are just a general community group.

CHAIR—What are the views of the organisation with regard to the benefits of nuclear energy in reducing the greenhouse effect—as against coal and other forms of electricity generation?

Mr Gray—We can see that in that regard there is a slight benefit. But the other means of producing energy from renewable sources have not been properly looked into.

Here we have all the sunshine we need. We have massive tides around the country that could generate energy. There are all sorts of ways in which electricity can be produced without adding to the greenhouse effect. If we used fossil fuels more efficiently we could reduce the problem of the greenhouse effect. It is just that we thrash things through at the cheapest rate we think we have got. I am assured by all the information that I get that nuclear energy is not one of them.

CHAIR—You put the argument that the economics of the uranium industry were dependent on weapons production. Can you tell me what proportion of uranium is used in weapons production as against the proportion used for power generation?

Mr Gray—I have not got the exact figures, but I do know that there was a case that got a lot of publicity in 1988 where Australian uranium was of a grade that could be converted to weapons production, but our laws would not allow it; it was reflagged. So it went off and we got left holding the same amount of uranium of a lesser grade.

CHAIR—You also put the view that the industry was in decline, uranium markets were in decline, and therefore we should not proceed with expanding uranium mining. Isn't that really a decision for those who are going to invest in uranium mining to make? Shouldn't that be left to them, if they believe it is profitable for them to mine and market uranium—subject to the safeguards that are in place obviously, but in terms of the economics of the industry I am talking about now? Isn't that a decision for the companies themselves to make, whether they can produce uranium profitably or not?

Mr Gray—I think it should be, provided the whole system is carried through to the end and the waste is contained effectively. But the way things are going at the moment we are leaving a hazard there for 240,000 years. How do we guarantee that? We cannot. In our recorded history of about 5,000 years we have lost all sorts of things.

CHAIR—Given that uranium production is and has been under way in Australia now for some years and irrespective of whether there is an expansion of production or an additional number of mines that come on stream, it does currently exist, do you have any suggestions for additional safeguards or whatever that should be put in place given that mining is in operation?

Mr Gray—Without being there, I cannot say. I do not know what safety procedures are in operation. That is for others to say—those that have been there. I know there is one in this room today who has that expertise. Is it really true to say that they are working on their own when for Roxby Downs mines we are providing all the water for them free. Anybody else wanting water pays for it. But the mining company doesn't pay, they are given it free. That is a subsidy to uranium mining.

CHAIR—Pastoralists also have free access to the basin.

Mr Gray—I am sure they would be pleased to know that there are the tailings of uranium going into it. It would cheer them up no end.

CHAIR—Into what?

Mr Gray—Around the water. The mine springs actually are going dry.

CHAIR—What evidence do you have of that? What evidence do you have that tailings are going into the water?

Mr Gray—There is a possibility always, I suppose. I was leaping to a conclusion

there.

CHAIR—You made a statement.

Mr Gray—All right.

CHAIR—You are retracting that statement?

Mr Gray—Yes.

Senator MARGETTS—In evidence, the people from General Atomics mentioned that they were involved with the decommissioning of munitions from the former Soviet Union. We have been frequently told by government and business that there is a very distinct difference between the military side of the uranium cycle and the power production side of the uranium cycle. Would you like to comment on whether or not you feel confident about the difference between those two?

Mr Gray—I am over 70 years of age. I have been involved with things for a long time. I know I am talking to politicians, but whether it is the politicians who are at fault or whether it is the officials, I do not know. I have found over the years that in many cases we have been left in the dark. It is a matter of being lied to by omission. I have no faith that there is that clear division in the two industries.

Senator MARGETTS—Certainly, the price of uranium was depressed for some years. The indications are now that there is an upturn in the market. You have indicated that part of that new market is in the areas in our region: in South East Asia and Japan—which can hardly be called a developing country any more—North Korea, South Korea and Taiwan, which is not a recognised signatory of the nuclear non-proliferation treaty. That may well be keeping the market more buoyant at the moment. Within your group, is there concern that that means that it is, to a certain extent, a buyers market in relation to nuclear material and uranium?

Mr Gray—We think that the opening up of orders in Asia from developing countries is from the massive sell that is produced by the industry to keep itself going. It seems to us that with western Europe and the US, who have had most experience with uranium both in nuclear weapons and in energy production, they have no orders in for any more stations. They are holding fire. They need to get things in a much better state because they are finding that now they have got stations that need decommissioning the whole thing is not as economic as before.

We know that in communities around the world, even Japan has been relying a lot on nuclear energy because they have very little energy resources of their own. When it was put to the vote of the people where they wanted to put the latest nuclear reactor it was turned down—they cannot have it. A station was being built in the Philippines, but

when the people changed the government the nuclear power station was stopped. It is not going to be finished. The general public all over the world seem to be in that same frame of mind.

Senator MARGETTS—There seems to be a growing movement, even in Indonesia, in response to that. There has been a lot of international pressure on China not to develop its nuclear weapons program. China, with France, was one of the few countries still testing nuclear weapons most recently. Do you see the new, emerging markets of South Korea and Taiwan as a potential security problem for China? What might the implications be for regional security?

Mr Gray—It was significant that China, of all the five declared nuclear weapons states, was the only one to vote in favour of the Malaysian resolution in the UN.

Senator MARGETTS—For the benefit of the committee, could you briefly elaborate.

Mr Gray—The Malaysian resolution in the UN was that they should start straightaway to negotiate an agreement to eliminate nuclear weapons and to set a definite time line, which four of the nuclear weapons states objected to. Unfortunately, Australia abstained on that vote. But China, as a nuclear weapons state, was quite definite. They wanted to get those negotiations under way to get rid of the nuclear weapons. In a similar way, India has refused to sign the test ban treaty just because they cannot get that agreement under way.

Senator MARGETTS—In what position will that put Australia and the United States in telling China what to do with their nuclear weapons if we are supplying nuclear material to countries which might be considered by China to be a security threat to them?

Mr Gray—It does not put us in a good position at all.

Senator FERGUSON—Mr Gray, you made a couple of statements which require some substantiation. I will only pick on a couple of them, although there were lots of others I would like to ask you about if time permitted. Where did you get your information from that there are no proposed new nuclear plants in Europe?

Mr Gray—From the Institute for Energy and Environmental Research, and they put a table in here about it.

Senator FERGUSON—The only reason I asked the question is that we heard evidence on Tuesday that there were a number of proposed power plants in western Europe and Japan—you might have been right about the United States—and that there was a projected increase in the use of uranium predicted over the next number of years. If the plants are closing and there is less use for armaments, how do you think they propose the

increased use of uranium over the next few years?

Mr Gray—I cannot answer that but the information that we get from this institute is that there are not any more.

Senator FERGUSON—Can I go to another thing that you said. I think your words were, ‘We are going to have to start giving it away.’ If we are going to start giving it away, why do you think Western Mining Corporation is having a \$1.2 billion expansion and the proposed proponents of the new mine at Beverley are spending all the money that is required to go through a lengthy and costly process to establish new mining? If we are going to have to start giving it away why do you think that these companies would be spending this sort of money?

Mr Gray—I suppose that was a rash statement to make. It is just a way of expressing, I think, the fact that the price is going to fall further than it is.

Senator FERGUSON—But don’t you think the people that are investing money would do more than just think that the price was going to rise or fall, that they would at least make some investigations as to the likely future price of uranium?

Mr Gray—I suppose they do. But they can be wrong, the same as I can.

Senator FERGUSON—Yes, but if they are wrong it is going to cost them a lot more than if you are wrong.

Mr Gray—I do not know—

Senator FERGUSON—In financial terms.

Mr Gray—In financial terms, yes. I have 18 grandchildren to think of and I want to leave a reasonable future for them.

Senator FERGUSON—There is only one other area that I want to ask a question on. In your submission you talk about incidents and you highlight well-known ones like Chernobyl and Three Mile Island. In fact, we had in evidence in Perth a list from, I think, the People for Nuclear Disarmament of some 600-odd incidents rather than accidents. It includes one where you say that in 1991 Japanese officials closed yet another nuclear plant because of a malfunctioning valve for changing nuclear fuel. I would have thought that perhaps the number of incidents that have been reported would only substantiate the effectiveness of the safety precautions that are in place in the nuclear industry rather than highlighting any deficiencies.

Mr Gray—I used to be a safety officer. My hardest problem to overcome was when we were advocating a change because we saw a problem in the way things were

done. People would say, 'We've been doing it this way for 20 years and nothing has gone wrong.' It is that sort of environment that creeps in, unless there is constant review. A complacency gets in. I believe, although I have not read everything about it, it was that sort of complacency that helped to make the Chernobyl accident as bad it was.

Senator FERGUSON—But isn't it a fact that so many incidents have been reported and so many malfunctions have been corrected that it substantiates the effectiveness of the safety precautions that are in place?

Mr Gray—It substantiates that there is a sort of effective thing there, but balanced against that is that if it happens to fail only once, as it did with Chernobyl, then the effects are massive and cover a great area. The result was that the radiation from Chernobyl went right over the UK as well as over Europe.

CHAIR—If there are no further questions, I thank you, Mr Gray, for your appearance before the committee. If there are any issues we wish to follow up with you, we will do so in writing and seek a response.

[10.56 a.m.]

BOWMAN, Mr Pearce, Executive General Manager, WMC Resources Ltd, 1 Richmond Road, Keswick, South Australia 5035

GREEN, Mr Steven Fitzgerald, Environment and Radiation Manager, Olympic Dam Corporation, WMC Resources, 1 Richmond Road, Keswick, South Australia 5033

MULLER, Mr Henry Bertram, Technical Consultant, Processing, WMC (Olympic Dam Corporation) Pty Ltd, 1 Richmond Road, Keswick, South Australia 5035

YEELES, Mr Richard Gregg, Manager, Corporate Affairs, Copper Uranium Division, WMC Resources Ltd, 1 Richmond Road, Keswick, South Australia 5035

CHAIR—The committee has before it your submission which has been numbered 74. It will appear in a separate volume. Do you wish to make an opening statement?

Mr Bowman—Yes we do, Mr Chairman. Certainly we welcome the opportunity to address you this morning. We trust that your visit to Olympic Dam over the last couple of days has been informative and you have been able to gain some further insight into our operations. You are aware that we have made a submission, as has been pointed out. We have also provided a number of attachments which we believe provide comprehensive historic and current information on our operations. We have also announced a major expansion—and I know you have been discussing that over the last couple of days.

I guess it is important to point out that Olympic Dam is principally a copper mine. Uranium, gold and silver are important by-products but I must stress also that we have a very low-grade uranium head grade. It is also the only uranium mining that we currently conduct. We do have an interest in Yeelerrrie as you are very much aware, but currently we have no options to take that operation to full production.

In regard to Olympic Dam, we have announced plans to more than double production to 200,000 tonnes of copper per year plus associated by-products, and on that basis our annual production of uranium oxide would be around 3,700 tonnes although that is dependent upon the final mine design and also on ore grade and recovery rates. We do have in place current environmental approvals to allow production of 150,000 tonnes of copper and associated by-products and at this level we would produce about 2,800 tonnes of uranium oxide per annum. Under our current expansion plans we would expect to reach this level of production by about 1999.

In April of this year we will publish a comprehensive environmental impact statement which will seek approval for production above 150,000 tonnes per annum. We have no current plans to increase production above the announced annual rate of 200,000 tonnes of copper and associated by-products but the EIS will seek approval for up to

350,000 tonnes of annual copper production. This is a process we have followed previously and it provides the operation with flexibility consistent with our previous approach where the initial EIS for Olympic Dam was based on 150,000-tonne limit even though the initial plans for the project were about 45,000 tonnes of annual production.

The Commonwealth government and the South Australian government have agreed on arrangements for the joint assessment of the EIS for the expansion and that will be led by the South Australian agencies. Draft guidelines for the preparation of the EIS were published in November for a four-week period to allow for public input and we will be encouraging a great deal of public input throughout the process. We have already had a number of discussions with interest groups about Olympic Dam, including environmental associations, Aboriginal groups, pastoralists and residents of Roxby Downs. So we believe we do canvas a wide range of opinion. Of course those opinions will continue to be used in the process of public consultation, similar to what we established previously for our initial EIS in 1982.

More recently in 1995 an environmental review was conducted of our existing processes and licences and this was advertised nationally to encourage public input. The review report was assessed by the Commonwealth and the state governments, and as a result our original environmental approvals of 1983 were confirmed. We have also conducted a separate process of public consultation and government assessment for the approval of the construction of a second borefield to supply water to Olympic Dam and Roxby Downs. That process comprised a survey and assessment report which was advertised nationally for public input and then assessed by the Commonwealth and the South Australian governments as a basis for the grant of a new water licence to WMC. These environmental reports are one means by which government regulates our operations at Olympic Dam. WMC has also noted this committee's interest in the issue of regulation.

As a supplement to our initial written submission, I provided the secretary of your committee with additional information last year about the legal framework under which we operate. We comply with 30 state and federal acts of parliament and their regulations and three Commonwealth codes of practice. On a quarterly basis we have representatives of a range of government agencies inspect our operations and review our environmental records. These agencies include the Environmental Protection Authority, the Health Commission, the Department of Mines and Energy, the Department of Housing and Urban Development and the Department of Industrial Affairs. These visits are in addition to the monitoring information provided to the state agencies on a regular basis for their analysis. The information covers areas such as occupational health and safety, water supply, plant emissions and other environmental impacts.

Arising out of the environmental review, which I have referred to earlier, new terms of reference have been developed for the Olympic Dam consultative committee to further facilitate ongoing consultation between the Commonwealth, the state and WMC. We propose that representation be provided in equal numbers by each of those parties. The

new terms of reference provide the Commonwealth with a mechanism to assist its consideration of ongoing environmental issues associated with Olympic Dam. We have also established an annual independent audit of environmental management systems for Olympic Dam as a means of ensuring that those systems are adequate to enable compliance with our legal obligations and to maintain a high standard of environmental performance. The results of this audit and the material will be provided and this information will be considered by the consultative committee.

We have currently 29 full-time environmental and radiation staff at Olympic Dam and our annual expenditure on supervision and monitoring—ensuring our legal compliance and also that we reach very high standards of performance—is more than \$3.5 million per annum. This expenditure does not include capital and operating costs for environmental management facilities. I think it reflects the commitment that WMC has and its continuing determination to achieve compatibility between economic development and the maintenance of the environment which is the foundation of our company's environment policy.

As a further development of our policy, during 1996 WMC published its first annual environment progress report which included information about Olympic Dam. In so doing WMC became the first resource company in Australia to produce such a report to help people both inside and outside the company to assess their environmental performance. This report had a very wide public distribution as a reflection of WMC's view that interested members of the public as well as regulators should be fully informed of our operations. This report is in addition to the considerable amount of information about Olympic Dam made public on a regular basis. Information includes our annual environmental management report, our annual environmental radiation report and our three-year environmental management program report and they are all submitted to government for assessment.

We are certainly aware that your committee has argued for more extensive Commonwealth involvement in uranium mining, particularly through an expanded role for the Office of the Supervising Scientist. Ultimately of course this is a matter for governments to resolve, but we would offer this perspective. In South Australia's case there is a long history of state supervision and regulation of uranium going back to Australia's initial major phase of uranium mining in the 1940s and 1950s. As a result, there is a great deal of information and expertise within state departments and agencies. For example, state departments and agencies have now been involved with our operation for more than 20 years originating with the exploration phase. As well as demonstrating a capacity to assess, monitor and regulate environmental issues, South Australia through its health commission has a pool of radiation protection knowledge that we believe is equal to any in Australia. By contrast, the expertise of the OSS is in wet tropics through its responsibility for the Ranger operation, not in the arid environment of Olympic Dam.

Also at our operation we do not have the potential serious issues relating to off-site

water discharges and surrounding very sensitive environmental areas and we have an entirely different tailings disposal system. We are not suggesting that we should in any way be less regulated; we are just suggesting there are differences. Bearing in mind that we have an existing Commonwealth consultation process, plus the Commonwealth's existing approval export powers, we believe that the addition of further layers of regulation to the industry would considerably increase costs without any further benefit in terms of the protection of the public interest. That interest is already safeguarded through the extensive monitoring and consultation processes that allow uranium mining to proceed in South Australia without detriment to public safety or to the environment. We also believe that further regulation would seem to be at odds with the current publicly stated intentions of the Commonwealth and state levels of government to reduce duplication of administration.

I now want to touch on four important areas before completing this statement. In relation to water supply, it is unfortunate that you were not able to see the borefields on the ground yesterday. We believe that would have been a most beneficial inspection process. However, we understand you had a good tour from the air and appreciate now the work that we have put in to our water supply in managing it in a very environmentally sensitive area. Our environmental staff undertake extensive monitoring of our borefields and report on a regular basis to state government and also the state government makes its own checks on our monitoring process. This ensures that our use of water remains within licence limits and the impacts are in line with the predictions of the environmental assessment work.

Commissioning of our second borefield last year will help to minimise any impact on mound springs. Our current draw of water averages about 15 megalitres a day. According to the Australian Bureau of Agricultural and Resource Economics, this is about three per cent of the total daily discharge of the South Australian section of the Great Artesian Basin. The daily recharge to the South Australian section of the basin is estimated at 450 megalitres. This again comes from the ABARE report in their 1996 economic and resource profile of the South Australian portion of the Lake Eyre Basin.

Our water licence is based on computer modelling of long-term draw downs which will permit an average daily supply of up to 42 megalitres. We believe our current licence limits will support annual production well in excess of our expanded rate of 200,000 tonnes per year. We have a continuing program of water recycling and conservation measures which have already reduced consumption per tonne of ore mined by 10 per cent and we intend continuing with those reductions into the future. So we have in place a program of careful water management.

We are also aware that you have viewed the tailings retention system at Olympic Dam and are aware of the extensive inquiry by the Environment Resources and Development Committee of South Australia which reported on a seepage incident which occurred several years ago. That parliamentary report was delivered about a year ago.

Water from a minor water evaporation pond made a significant contribution to the total seepage. This water was in fact naturally occurring ground water that seeped into the mine and had been pumped to the surface. The parliamentary committee found that there were no harmful effects to employees, the local community or the environment arising out of that seepage. We have, however, taken a number of steps to enhance our management and monitoring of the total tailings system. As explained during your inspection of the system this week, WMC has already prepared for the decommissioning and rehabilitation of the tailings area, notwithstanding the very long life of the project.

Turning now to occupational health and safety. Our radiation dose limits to radiation workers in Australia are now being reduced in accordance with international recommendations, but we would point out that at Olympic Dam we have been operating under those lower international limits since 1990. Our average annual doses to mine and processing personnel are 2.7 and 1.2 millisieverts respectively compared with the international limit of approximately 20 millisieverts per annum. The International Commission on Radiological Protection has advised that it considered the radiation management practices at Olympic Dam to be the best of any underground mine in the world.

The fourth area I would like to talk about is the management protection of Aboriginal heritage. At the time the Olympic Dam operation was first proposed, there were no Aboriginal people resident in the area or its immediate vicinity who had traditional responsibility for the area. This remains the case today. Indeed, our nearest communities live in Marree and Port Augusta, each more than 150 kilometres from Olympic Dam.

Nevertheless, WMC has a program for regular consultation with Aboriginal communities who have expressed an interest in the area of our operations or our service corridors, including our powerline and water supplies. When surface disturbance work is proposed, heritage surveys are undertaken with the relevant Aboriginal communities to ensure high standards of management and protection of Aboriginal heritage.

We are also discussing with those communities the establishment of community development programs to assist with heritage management, administrative support for community management and the provision of education, training and employment opportunities. We expect these agreements will be in place within the coming year.

In conclusion, WMC submits that the conduct of our Olympic Dam operation demonstrates that a major mining and processing project like this can be undertaken in a manner which protects the environment and at the same time benefits the community generally through the provision of employment and royalty and export income.

CHAIR—Thank you very much. Do any of your colleagues wish to make opening statements?

Mr Bowman—No.

CHAIR—Can I make a correction to one of your comments before we proceed with questions. I think I am quoting you correctly when you said that the committee had argued for a wider role for the Office of the Supervising Scientist. That is in fact not the case. There have been submissions put to the committee arguing for that, but they are submissions like your own that still have to be assessed by the committee and conclusions reached. Certainly, the committee has not reached any conclusions on that issue.

Mr Bowman—I take your point. We are aware of your interest in that.

CHAIR—In relation to the water supply from the Artesian Basin, when the indenture was signed, you were exempted from water charges—as indeed were pastoralists at that time. I raised this as an issue with one of the other witnesses when he was commenting about water. As you are probably aware, pastoralists do now pay for their water. What would be the attitude of Western Mining to being charged for water they draw from the Artesian Basin?

Mr Bowman—Mr Chairman, I am not aware that pastoralists do pay for their water. I understood that the South Australian government has made a public statement saying that no users of underground water do pay charges.

CHAIR—Sorry, I was in error. I knew previously pastoralists had received water without charge, but I was relying on one of the submissions that claimed that pastoralists do now pay—the Conservation Council's submission, but obviously they are in error.

Mr Bowman—Mr Chairman, I would point out that WMC, being its own utility, has invested \$100 million in the supply of water to our sites, so we are not exactly getting it for free.

Senator MARGETTS—Would Western Mining be able to supply the committee with a copy of their licence conditions?

Mr Bowman—Absolutely.

Senator MARGETTS—You mentioned before in your presentation that you operate according to the ALARA principle—that is, as low as reasonably achievable. Could you comment on the situation in relation to acid mist for your workers, please?

Mr Green—Acid mist, like any other hazard in the workplace, is evaluated. We have an extensive monitoring program. Currently, we are under legal limits, and we are aiming to reduce any hazard within the workplace. It is no different to any other; acid mist is just one of those.

Senator MARGETTS—Even though you might be under legal limits, is this as low as is achievable in the workplace?

Mr Green—That is what we aim to do. We aim to reduce all hazards to as low as reasonably achievable, and we are working on that continuously.

Mr Bowman—Mr Chairman, for the benefit of the committee, acid mist is to do with our production of copper in our copper refinery and nothing to do with uranium.

Senator MARGETTS—There are radioactive gases associated with the acid mist process, are there not?

Mr Muller—No, not really. The acid mist results from the process of electro-winning a copper solution, which is recovering copper from a copper sulphate solution. At one of the electrodes oxygen is evolved and as that oxygen rises through the sulphuric acid, copper sulphate liquor, the bubbles burst when they reach the surface. We do two things to minimise that. We have layers of plastic beads which contain that bursting event and we also put a foam over the top which contains it further. We also have additional ventilation moving across the area. To get back to your point, there are no radionuclides associated with that emission.

Senator MARGETTS—What is PO210?

Mr Green—Polonium-210.

Senator MARGETTS—You mention emissions of acid gases, particulates, heavy metals and also polonium-210 which can be built up by recycled dust/gas control by ventilation. Is that not part of the acid mist process?

Mr Green—When you are referring to the refinery, occupational acid mist is a problem with the refinery that we need to control and we have those mechanisms in place. What that is referring to would be stack emissions from the furnaces up our exhaust stacks. We have extensive gas control. Firstly, we have a bag house which collects that dust, which includes the polonium-210, which is then deposited in the tailings retention system. Secondly, we have a jet bubble reactor, which is a lime bath which catches the acid mist.

Senator MARGETTS—I am just trying to get a handle on the acid mist problem because it is one, I guess, that we have heard about and, in the end, it might relate to general approaches to workers' health and safety. Have you received complaints in relation to the standards and the problem of acid mist by your work force?

Mr Green—Not that I am aware of.

Mr Bowman—We operate to a licence condition. They are heavily monitored by all of the regulatory agencies.

Senator MARGETTS—I am sorry, that is not what I asked.

Mr Bowman—Have we received complaints from our workers? Not that we are aware of.

Mr Green—If there were complaints from workers, we have on-site occupational health and safety meetings, so there is regular consultation with the work force. We have area meetings and site meetings, so any issue would be brought up in those minutes and would be discussed at those meetings.

Senator MARGETTS—Yes. If an issue has been brought up and your response, I guess, might be similar to us—that you are operating under legal limits and that is as far as it might go?

Mr Bowman—We would respond. That is part of our process of dealing with our employees. If there is an issue there we would obviously respond. We are well regulated and monitored. If there is an issue, we would respond if we knew what the issue was.

Senator MARGETTS—Are your employees perfectly happy with your response?

Mr Bowman—As far as we are aware, unless you have other information, that has certainly not been brought to our attention.

Senator MARGETTS—It has not been brought to your attention by any safety officers at all?

Mr Green—We have an occupational health and safety committee on site. If that has been brought to the attention of the committee, no doubt they are working on it or they are investigating it further. As we said, we have regular monitoring so that monitoring information is available to any employee who may have a concern. I am not personally aware of any problems with acid mist, but if there is—

Senator MARGETTS—Do you define a problem of acid mist as being above the legal limits?

Mr Green—Not necessarily. As I have mentioned in the last few days, we do not work to legal limits. We work on the ALARA principle for radiation particularly, but also in the workplace hazards.

Senator MARGETTS—I want to continue, to a certain extent, with a similar theme. On page 1 of your submission to the committee you said that there is no need for

you to give any information to the committee in relation to the transport of material from Roxby Downs because it did not fit into the definition of uranium ore. Yellowcake uranium oxide, I guess, is a concern to the community.

In the terms of reference we talked about uranium ore and uranium waste. Of course, under a strict technical definition, yellowcake is neither of those. Would you say that that fits into the spirit of the terms of reference or perhaps more the technical wording of the terms of reference?

Mr Bowman—Senator, are you concerned with our transport of our product, or is it—

Senator MARGETTS—That is not what I asked.

Mr Bowman—We will supply the information if you wish.

Senator MARGETTS—That would be good. It is a concern because if we have a term of reference which talks about transport of uranium ore and waste and, in Western Mining's submission to us, you have indicated that there is no need to give information because uranium oxide or yellowcake does not fit into that technical definition. I guess that general—

Mr Bowman—Let me just answer that. We obviously comply with the safeguard standards. We are monitored by the director of safeguards in our transportation processes. We have to comply with an approved process for transport. There is a considerable amount of work put into this in the way the material is packaged, handled and stacked in containers. Convoys come down, there is a police escort, and there is a following vehicle for clean-up. These are all regulated procedures that we follow in complying with the safeguard standards. It is a standard procedure that we have been monitored on for many years.

Senator MARGETTS—The precursor of this committee was the committee looking at radioactive waste, everything except from uranium mining, and we looked at it in very fine detail. In fact, Senator Chapman was very interested in the transport of radioactive waste, especially in South Australia. If anybody had read the previous report of the radioactive waste committee you would know that we are very interested in not only—

Mr Bowman—This is not waste though; this is a prime product.

Senator MARGETTS—Sorry, if I could finish. The community and the committee were very interested not only in the storage of radioactive waste but also in the transport of radioactive materials of any sort, and that included the transport of isotopes from Lucas Heights to the various parts around Australia and the transport back of those isotopes to a point of storage at a later date. I think on that basis you could assume that there is a keen

interest both from the committee and from the community in the transport and storage of yellowcake as well as other nuclear materials.

If you could present that information to the committee it would be useful. For me, it is a little disappointing. If you extrapolated from the work of the committee or read the previous report then you would realise that perhaps your point was a bit pedantic in not producing any information to the committee.

Mr Muller—I doubt that there is any problem in providing exactly the information that you need. You are quite right, our interpretation of ore was, namely, what comes up the shaft and comes into the processing plant. What we were saying there was that we do not transport any uranium bearing ore material into Olympic Dam. We certainly transport uranium ore concentrates, and that is the one that you wish additional information on. I see no difficulty in providing that.

Mr Bowman—Absolutely. It is a standard procedure and follows the guidelines.

Senator MARGETTS—I know that Senator Lees wants to follow up on the seepage from the tailings dams. I would like to refer you—I am sure you have a copy somewhere—to a letter from the previous minister for the environment on tailings dam seepage. How long was there between the beginnings of community concern on dam seepage—before the first reports and the first questions—and the lining of the holding ponds? When were the holding ponds finally lined?

Mr Bowman—I will address the first part and I will ask Henry to address the second question. We had a series of incidents where our monitoring system picked up an increase in the watertable beneath our tailing storage facility. This was reported both publicly and to various government agencies. There had been a series of issues which I will get Henry to discuss. Because the liquid material, the watertable material, is very similar to what is in our ground water there was no need for us to determine whether there was seepage or not. We then decided, after some time, that—

Senator MARGETTS—Could you give the dates of these things?

Mr Bowman—Yes. The seepage was first picked up in late 1992, and we made a public announcement in March 1994 that we believed there had been a seepage process. We raised the issues. We identified the information. We worked with the government agencies here to determine where these watertable increases were coming from. I will ask Henry now to discuss the technical issues around that.

Senator MARGETTS—Before he does, you were not the first people to raise that issue though, were you?

Mr Bowman—We were the first people to raise the issue, and we were the first

people to announce the issue.

Senator MARGETTS—Were there not questions being asked in the late 1980s by the community?

Mr Bowman—We did not have a problem in the late 1980s.

Mr Muller—The Olympic Dam operation commenced in August 1988, if I remember correctly. To go back to your opening sentence—I think you mentioned the time of community concern—I would add that our system was being monitored by ourselves and also by our quarterly review with the various government departments.

This increase in the watertable in that area was noted. The interpretation of it was the thing that was difficult. I would make the point that it is a matter of hydrogeology and in that area up there, or in any area, the speed at which the system might respond can be really quite slow. In our case up there, underlying the tailings area that you saw the day before are a few metres of soils which have been derived from the next layer, which is dolomite. There is somewhere between 20 and 40 metres of dolomite. Dolomite is a calcium magnesium carbonate. Below that, there is a couple of hundred metres of quartzite. Below that, there is 150 metres of shale, and then you get into the deposit.

The natural watertable is at about 50 metres. The extent to which that natural watertable responded to natural events was unknown. It just so happened that in, I think, 1991 or 1992—

Mr Green—It was 1989 and 1991.

Mr Muller—In those years, we had two rainfall events which were extreme. The Olympic Dam has an average rainfall of 210 millimetres per year. It has an average evaporation of 2,720 or of that order. So it has a very strong evaporation excess over the natural precipitation. I think in one month, in March of whatever year, we had—

Mr Green—It was 420 millimetres.

Mr Muller—We had a massive rainfall event. Some of the water which ponded around the area—and you probably saw what happens in the claypan areas yesterday—is believed to have infiltrated the tops of some of the monitoring bores and had some effect on the interpretation of the level. There was much discussion between ourselves and also our governmental colleagues, who tried to assist in interpreting this. It was monitored for some time and was tried to be interpreted in terms of the local rainfall event. The whole thing is in an area which is very slow to respond for any seepage front, which is transferring from the surface.

Hence, it was in February 1994 that we all, with some very good diagnostic work

from the department of health and so on, agreed that there was something amiss here. It could not be explained by natural events, so we then went into a very active program of what I call diagnosis. In other words, here we have a system and we really are unsure exactly what is affecting the performance of that system, so let us go and find out. We drilled a whole lot of holes. We did a lot of geophysical work and eventually established that most of the water that was accumulating had in fact come from our mine water evaporation pond—which I presume was pointed out to you this week—which is water that seeps into the underground mine. It is saline water and it is pumped to the surface in a separate area, and that separate area happened to be close by the tailings.

Senator MARGETTS—Very close indeed.

Mr Muller—Very close. We believe that that has been the major source of that water which infiltrated.

Senator MARGETTS—And that is still there?

Mr Muller—That is still there. It is programmed to be moved—

Senator MARGETTS—When?

Mr Muller—I believe in about six months, and it will be moved well to the north-east of the mines so that it no longer has an influence on the interpretation of what is happening in that area. So we went through a period of recognition that we had a problem, jointly, with everyone that was concerned, a period of diagnosis to try to define exactly what was the problem and then finally a period of implementation which involved the construction of these evaporation ponds—

Senator MARGETTS—I am sorry, when were they finally constructed? When were they finally in operation?

Mr Muller—We are going to have to confirm this. My memory says—

Mr Bowman—Late 1995, I think.

Mr Muller—Yes, 1995. But please let us confirm that date.

Senator MARGETTS—Sure. But if those dates were correct, from the time you acknowledged there was a problem initially to the time action of some sort was taken—and there is still action to be taken further, as you indicated—was three years?

Mr Muller—No, three years is now.

Senator MARGETTS—No, late 1992 and 1995, that is three years.

Mr Muller—No, 1992 was a recognition that something may be amiss. 1994 was the recognition that there was something amiss. Then really the decision was made in, I think, February 1994 that we really have to find out what is happening here.

Senator MARGETTS—You might well be aware of the letter from the previous Minister for the Environment—and this comes from the joint submission from the Friends of the Earth and the Conservation Council of South Australia—where the minister said:

The seepage was not predicted in the Environmental Impact Statement (EIS), by the company or by the regulators, and seepage would have been unlikely to occur if the procedures described in the EIS were followed.

Would you like to comment on that?

Mr Muller—Yes, I think I would. The EIS, remember, was compiled in 1982 and I think it was finally lodged in 1983, and during that period of time, in any project, this is a period of conceptual work on the basis of the information that is available to you. You design and propose what is going to be put in. In our case, in respect to the tailings dam, what we proposed at that time was based on some test work, some small scale test work and model work, that was done at the University of New South Wales. That showed us that the subaerial system was by far the best approach to achieve all objectives when you come to impounding tailings. That was the basis of the proposal in the environmental impact statement.

There was some concern in the assessment of that by the government people, and we agreed with their comments, that the description as included in the EIS in fact included a central decant tower to remove any surplus liquor and to transfer that to a separate area. We and they were concerned about seepage in and around that tower. We were also concerned about the materials of construction. One of the requirements of the assessment was that we would carry out additional work when we ran a pilot plant in 1984-85, particularly in 1984. So we constructed a very substantial tailings retention area associated with the pilot plant, obtained a tremendous amount of data from that and, as a result of that, then changed the design of the installation—with everyone's agreement—and that is what we put in.

I think what we have recognised with experience with this was that it would be more desirable to remove any supernatant liquor, any liquor that ponds on the surface of the tailing dam, as quickly as possible; and in fact that is what we are doing now and that is what we will propose to do in the future.

Senator MARGETTS—How long do the liners last?

Mr Muller—Liners, I think, have an indefinite life under those conditions.

Senator MARGETTS—The previous minister seems to have a different opinion:

As synthetic liners have only a limited lifespan they have not been used in the tailings dam as their effectiveness as a seepage barrier would decrease over time.

Mr Bowman—There has been a great advance in liner technology over the years. As Henry has also indicated, our natural concern was with the decant structures, which were probably of steel and of concrete, and of course there is an acidic environment. At that point in time we were concerned about their longevity. There are now different polymer type materials that we can use for decant structures and that is what we are currently using. There has been a lot of advance in liner technology.

Senator MARGETTS—So in fact the tailings dam itself could feasibly be lined these days with a reasonable amount of confidence?

Mr Bowman—I make the distinction between the storage facility and the evaporation ponds. We store material in our storage facility, which has a clay liner, and we pump off the supernatant liquors to a lined evaporation pond that you see.

Senator MARGETTS—Is it not the case that these procedures with limiting the amount of ponding will only ever reduce the amount of seepage and not ever, with any guarantees, cut it off?

Mr Bowman—Maybe I will address the attenuation issue, Henry, and the amount of liquors there.

Mr Muller—I think that with any structure which impounds water or moist material, there will be some seepage from it. I cannot deny that there will be absolutely no seepage. There will always be some seepage. What we do is create a clay barrier and compact that. In fact, the very best protection against seepage is the very fine material itself, as it is laid down and as it dries out and successive layers are put on. Then you end up with very low permeabilities. But there will always be a little bit of a wetting front which will descend below this.

We found in the days of the pilot plant—and it has been substantiated very much by the work that we have done on site recently, or during this period of assessment of the tailings area—that the underlying alkaline soils and the dolomite below that has a very high acid neutralising capacity. If there is a wetting front gradually moving down through this material, any acid associated with it is neutralised. Any metal salts or anything else that is associated with it are precipitated and what comes out the other end and, if it goes far enough, will enter the local ground water is in fact saline water, very similar to the saline water that occurs there naturally.

Senator MARGETTS—Do your licence conditions allow for seepage from your

tailings dam?

Mr Muller—Good question.

Mr Bowman—I think you are describing something here that is absolutely minuscule.

Senator MARGETTS—No, I asked a simple question.

Mr Bowman—I don't think we have a licence condition for seepage from the tailings dam, as far as I am aware.

Mr Muller—I am not sure that there is a licence which covers that. We have approval from the minister under a project notice. In the project notice we describe what will happen. As I understand it, that is the approval process.

Mr Yeeles—I think it is relevant that the committee sees the letter you are quoting from. We did subsequently receive another letter from the same minister in January 1996 approving expanded production up to 150,000 tonnes, in effect confirming our original environmental approvals. That was done with the minister having full knowledge of the seepage event and the action the company was taking to deal with it.

Senator MARGETTS—Terrific. You mention the benefits to the South Australian community or government. There is a list of the royalties and other payments made to South Australia. It has been mentioned, even in your submission, that there was at least \$38 million paid in assistance with infrastructure costs from the South Australian government. It has been mentioned from several people today that you do not actually pay for the draw down. Everybody pays for their own bores and pipes, no government generally pays for somebody's own bores, but you do not actually pay for the draw down of the aquifer water that you use. I know that you are saying that the pastoralists don't currently pay for their draw down. Do other consumers in South Australia pay for bore water usage?

Mr Bowman—No.

Senator MARGETTS—Nobody?

Mr Yeeles—No user of underground water pays in South Australia.

Mr Bowman—To get back to your previous point, I want to point out also that the Development and Resources Committee of the South Australian parliament also reported on all of the issues that you have raised, and did indicate that there were in fact no harmful effects on the community or on any person or situation both now and in the future; and they did that after a fairly extensive, significant review of the whole proposal.

So we are raising the point again that any wetting front—or whatever—that comes from the bottom of our tailings area has in fact no harmful effects whatsoever.

Senator MARGETTS—I have another unrelated question. You have mentioned in your submission the indigenous awareness program. The town of Roxby Downs would not exist without the mine: would you agree?

Mr Bowman—That is what it was built for, yes.

Senator MARGETTS—Fine. Has your indigenous awareness program of cultural sensitivities extended to people in the town, with regard to recreational use of areas in the area and about potential areas of sensitivity for Aboriginal people?

Mr Bowman—We have an intensive induction process.

Mr Green—Every employee gets a very intensive induction. We also have, for the community, information sessions on a regular basis. It is quite common knowledge throughout the whole community that there are sacred sites or sites of significance in the area and that these are to be avoided. I guess the mechanism we use is that we do not highlight these areas because then people will go and look, as people do. We push the ‘No off-road driving’ message. That is our main defence mechanism to prevent people from encountering these types of areas. It is just a general good environmental practice to ensure that there is no off-road driving.

Senator MARGETTS—Does that awareness program include the recognition and handling of artefacts?

Mr Green—The main recognition is ‘Stay away’, basically, and ‘Don’t go entering the areas’. That is the recognition.

Senator MARGETTS—Would your average worker or towns person know what an artefact was?

Mr Green—Yes, they would. We have significant information brochures and we have photographs and diagrams. There is an enormous amount of information that is out there.

Senator MARGETTS—So the fact that the Roxby Downs Motor Inn was using artefacts in its garden would be just an anomaly?

Mr Green—I have no evidence of that.

Senator MARGETTS—Okay.

CHAIR—And nor do we, I might say.

Senator FERGUSON—It was a claim. We were shown a rock that was brought in which none of us could even look at; but one of the people that gave us evidence on behalf of one of the native claimants to the area said, ‘This is an Aboriginal artefact’ and walked out again. We have no knowledge of whether it was or was not one.

Mr Yeeles—With respect, that is a fairly serious allegation to make against the motel—in effect, breaching a state law. If there is some evidence—

Senator LEES—He went further than that. He said that around the town there were quite a number of rocks that were brought from an area that was publicly known to be an Aboriginal site, and that that site has been largely denuded of what I guess one would describe as attractive garden material types of rocks. The stone that he brought in and showed us during the hearing was, in fact, one he described as a grinding stone—a small round stone that had been worn smooth.

Senator FERGUSON—But we did not get a chance to see it, with due respect.

Senator LEES—I did.

Senator MARGETTS—I did.

Senator FERGUSON—When? Afterwards?

Senator LEES—No; at the time he brought it in.

Senator FERGUSON—You were pretty quick!

CHAIR—Are you familiar with the submission that has been lodged with this committee by the Conservation Council of South Australia and Friends of the Earth?

Mr Green—Yes.

CHAIR—Can I ask you to respond briefly, as you are familiar with their submission? They make a series of recommendations but, in particular, they make recommendations regarding the waste management program and also regarding the Great Artesian Basin mound springs and borefield B. Are you familiar with those particular recommendations?

Mr Yeeles—Yes.

CHAIR—Would you like to provide a response to their claims and what they have made as recommendations to this committee?

Mr Yeeles—In terms of the waste management program, one of their recommendations is that it should be made public. In fact, it is made public through a three-yearly environment management report. Our waste management program is a matter of public record.

Senator LEES—Is that every three years?

Mr Yeeles—Yes.

CHAIR—And what about the borefield B approvals requiring a full environmental impact assessment, and also the management plan?

Mr Yeeles—They had that in the sense that we had—

Mr Bowman—We addressed that. I think we went through the survey and assessment report. It was a public process. We in fact installed a copy in the Conservation Council for six weeks for them to make comments on. It was an approval that also went through both Commonwealth and state agencies. The licence was then issued on the recommendations of both of those agencies. So we find it a little difficult to respond to that one.

CHAIR—Thank you. Senator Lees.

Senator LEES—I have got a large number of questions, but we are already up to the time allocated in the program. Could I ask you to take on notice the Conservation Council's submission and reply to it in writing, in particular to their recommendations? And now, very quickly, I would like to raise a couple of issues, even if we are out of time.

CHAIR—Yes, we have a few minutes.

Senator LEES—I would like to go back to what you touched on in your opening statement regarding the South Australian committee and draw your attention to their recommendations, which no doubt you are well aware of. Are there any recommendations that you objected to or are opposed to?

Mr Bowman—I do not believe there are, in particular.

Mr Yeeles—The South Australian committee has subsequently reported back to the parliament on how the recommendations are being responded to.

Senator LEES—In particular, just looking at the recommendations and comments relating to public scrutiny, which we touched on just a moment ago, three years is a very long time and, as no doubt you are aware, there is clause 35 of the indenture which

prohibits information that you give to the government being released publicly—and that goes back into the indenture. The committee considered that ‘there would be considerable benefits in the Olympic Dam operations being more open to public scrutiny’. Do you agree that three years, for example, is a very long period of time and that—

Mr Yeeles—Of course, that is a three-year environment management program; there are annual environment management reports. As well, I point out to the committee that I have written to all of the conservation groups in South Australia—I did this as soon as I took my position in the middle of last year—inviting them to seek any information they may desire from WMC. I have got copies of the letters, if the committee would find them helpful. I have attended public meetings organised by conservation groups. In my view, and in my experience, I think that this company is as accessible in terms of information as any other I know.

Senator LEES—I think what we are looking at, rather than comparing company to company, is an open process where, as we saw yesterday—

Mr Yeeles—What is an EIS, if it is not an open process?

Senator LEES—When an EIS is done, as I think we have just referred to back in 1982, there is a lot more that the community now desires—further information particularly relating to the impact on the environment of not just uranium mining but indeed any mining activity, including related issues such as your draw down of water.

If I could just say that the last couple of days were very informative. In particular, I would like to thank Mr Green for all the information he freely provided to us. But a question that kept coming up in my mind is: why is this not completely and freely available? Sections of it are. I know that the material on the work that has been done on the mound springs is, but, for example, just looking through what has been said by the South Australian committee and also my impressions of what is able to be found on a regular basis by the public, by those in the community that are concerned, is—

Mr Bowman—Senator, if we could respond: this information is available in our annual report. All of the information we have talked about is available. We do submit it. I do not know what else we have to do—whether we have to hold a dance band downtown to get it across to people—but it is publicly available information. We do submit a report.

Senator LEES—I think an open opportunity for people, or perhaps a representative, to discuss on a regular basis with you particular issues. Part of the trouble here, of course, is actually financing the Conservation Council to do some of the work that they would like to do. But when a company is monitoring itself and, as you say, you feel that you have enough regulations, and it is a government process, the government has a clause in the indenture that limits, basically, information that it can pass on—the secrecy clause—do you see that that raises concerns within the community?

Mr Bowman—We do publish information above and beyond the normal process. As far as monitoring ourselves is concerned, we are also monitored by the government independently. So we are not out there creating our own records. They are both checked and monitored. There are quarterly meetings with the various agencies I talked about in my presentation, all of whom have various different views and perspectives on the monitoring information.

Senator LEES—Is there any public access to those meetings?

Mr Bowman—No, not normally, but we do publish a report.

Mr Yeeles—On the Conservation Council, I do have a letter from them saying, ‘We want all of this information, and we are still going to oppose your operation.’ I think we are entitled to—

Senator LEES—I am quite happy to see any letters that you have—one way or the other—on this issue.

Mr Yeeles—While we play our part in informing them and have been willing to provide answers to any information requests, I think it needs to be on the record that that is their position.

Senator LEES—In conclusion, in particular I am interested in the recommendations from the South Australian committee, Nos 10 to 15. Could I have your comments in writing on those recommendations? Perhaps you feel that you are already doing a lot.

Mr Yeeles—We would be happy to respond to all of these.

Senator LEES—If you like, but Nos 10 to 15 are the ones that relate to access to information and an open public process.

Mr Bowman—I raise the point again that we did also publish the first ever annual environmental report nationally for WMC, which was a first for resource companies.

Senator LEES—I realise that. That was all the information Mr Green provided to us and it was most helpful. But if you could see the problem of the company continuing to report on the company and what people feel is an ability to get, shall we say, behind that and to actually, on a one-to-one basis and on a regular basis, discuss some of their concerns, perhaps with you or experts that you have employed—

Mr Bowman—The question is: to what extent do we go? There are hundreds of groups out there. There is always this issue of to what extent we have to go. We do have a governmental process that has been put in place. What you are telling me now is that

the governmental process is unacceptable—we do not have to report to 17 million Australians. I think a difficulty we have is knowing what, in fact, we are trying to achieve and to whom we report. We have offered, for those groups who do want information, that we are prepared to provide them with information. I guess the process is always: when is enough, enough?

Senator LEES—I think we are looking for who we report to. I am sure the conservation groups in South Australia would look to the Conservation Council as being the peak body. As far as government processes not being adequate, I would go back to the indenture that has a secrecy clause in it, which is what, I think I can say, in South Australia is causing a lot of the problems.

Mr Bowman—We had waived that issue because we do report publicly on our information.

Senator LEES—I will ask one further question, and that is relating to the Aboriginal heritage issue. Are you aware that there are two groups with title claims on that land, not just one group? And is it not the case that you are working with only one of the two Aboriginal groups?

Mr Bowman—I think there are actually three, Senator.

Mr Yeeles—If you could specify the groups, I could perhaps elaborate. Are you talking about the Andamooka Land Council and the Kokatha People's Committee?

Senator LEES—Yes.

Mr Yeeles—We have consultation with both organisations.

Senator LEES—With them as well?

Mr Yeeles—Yes. In fact, we are just putting in place this week an agreement with the Kokatha People's Committee on a heritage survey of a power line. We consult with the Kokatha People's Committee as well as the Andamooka Land Council.

Senator LEES—Perhaps the best way to deal with that is if we ask you to comment on the evidence that they gave on Wednesday. We will give you a copy, when *Hansard* is available, of that record, and ask then for your feedback. They still have a lot of concerns and, in particular, concerns relating to township activities and the activities of residents there out on some of their sacred sites. All of that will be most helpful to the committee.

Senator FERGUSON—I will continue on that line because that was the area which was concerning me. You may not have been aware that we did take evidence on

Wednesday afternoon from people who claimed to be traditional owners of the land, and so you did not have an option to hear the evidence. I would concur with Senator Lees: I think you should have the opportunity to read that evidence closely and comment on it and give us a response.

In the light of what they said and the claims that they made, I am wondering whether, Mr Green, you might be the appropriate person to put on the *Hansard* record some of the processes that you undertook in your consultations with the Andamooka Land Council in determining whether or not they were the appropriate body that you should be dealing with—as I understand from your initial statement, there were no resident Aboriginals on the land when you first took it up—how the process of choosing the Andamooka Land Council was made and what appropriate consultations took place. I am wondering whether you could elaborate, for the purposes of the *Hansard* record, on what took place in those initial stages.

Mr Yeeles—At the time of the original EIS, going back to 1982, the Kokatha People's Committee was the only Aboriginal organisation that indicated publicly an interest in the area of the proposed mining plant and there was consultation with the KPC during and after the EIS. A lot of ethnographic work that was done with the KPC has formed the basis of management procedures to protect ethnographic sites.

There has been, as I understand it, ongoing consultation with the KPC since that time but again, as I understand it, some disputes arose among the Kokatha community as to who had the right to speak for them. It is not WMC's role to take sides in disputes within Aboriginal communities; hence we talked to both the Andamooka Land Council, since their formation in the early 1990s, as well as the KPC.

Senator FERGUSON—Who have your main negotiations taken place with, particularly when it comes to the clearance of sites and the knowledge of areas where there are artefacts? It would appear to me that the Andamooka Land Council is the body that you particularly—

Mr Yeeles—If I go back again to the original EIS, a lot of information was provided by the KPC in those days, archaeological as well as ethnographic information. We have all the information from the KPC that is necessary for us to make decisions about what has to be protected. More recently the Andamooka Land Council has indicated an interest in the area so we have done the same sort of survey work with the Andamooka Land Council. In a sense we have sought the same information from both groups. It is not a case of simply ignoring one group and listening to another group; we have extensive information from both groups.

Senator FERGUSON—The reason it needs to be clarified is we need to know whether the people that spoke to us on Wednesday night were acting on an individual basis or whether they actually represented anybody. I think it was Mr Dare and Mr

Starkey. We need to know whether they were people that you have consulted with or whether they were coming along on an individual basis. In fact, we need to be assured that you are dealing with the right people and that these are not people that have been neglected for any particular reason.

Mr Yeeles—It is not WMC's decision as to who has the traditional interest. We do consult with the state department of Aboriginal affairs in any particular area as to who it is appropriate to consult with.

CHAIR—There being no further questions, I thank you Mr Bowman and your associates for appearing before the committee this morning and for the evidence that you have given. If there are any further issues that we wish to follow up with you we will do so in writing and seek a response. You have already indicated that you will provide certain responses in writing and we look forward to receiving those. Thank you very much.

Mr Yeeles—Before we finish, and concerning the issue of transportation, it is referred to in our submission. There is some reference to it on page 77. It is not an issue that was totally ignored.

Senator MARGETTS—No, I realise that. What I said was that the mention of transportation in your submission to the committee that I read, or perhaps it was the smaller submission, was that you did not need to give further information to the committee because by definition you did not classify uranium oxide as needing to be dealt with in your submission. My criticism was that given the spirit of the committee it would be very obvious that we would be interested in those issues. It was more of a pedantic point than perhaps a helpful one.

CHAIR—Again, thank you very much.

[12.04 p.m.]

GOREING, Mr Robert Andrew, Chief Executive Officer, South Australian Chamber of Mines and Energy, 63A Conyngham Street, Glenside, South Australia 5065

HARRINGTON, Mr Timothy Richard, Member of Environment Committee, South Australian Chamber of Mines and Energy, 63A Conyngham Street, Glenside, South Australia 5065

CHAIR—I welcome representatives of the South Australian Chamber of Mines and Energy. The committee has before it your submission, which we have numbered 87. Is it the wish of the committee that the document be taken into evidence and incorporated in a separate volume? There being no objection, it is so ordered.

Mr Goreing has just provided us with an expanded version of what he intends to present to us this morning. I suggest to the committee that we take that as a supplementary submission. Is it the wish of the committee that the document be taken into evidence and incorporated in a separate volume? There being no objection, it is so ordered. Do you wish to make an opening statement?

Mr Goreing—We certainly do, as a chamber, appreciate the opportunity to present evidence this morning. I am the chief executive officer with the South Australian Chamber of Mines and Energy and my colleague Tim Harrington is an environmental consultant with Hinhill Engineering and a member of the chamber's environmental affairs committee. Tim has expert knowledge and experience in environmental matters and radiation related to uranium mining and milling.

The South Australian Chamber of Mines and Energy is the peak body representing the minerals and petroleum industry in South Australia. The chamber represents a whole-of-industry perspective which focuses on the capacity of the industry to operate according to best practice principles and deliver the economic, social and cultural benefits sought by the community.

This submission complements the written submission that you have identified. We do not intend to go over that ground but rather elaborate and expand upon principally three of the terms of reference. They are: the role of the Office of the Supervising Scientist, environmental impacts, and health and safety implications. It is our intention to focus on South Australia. Other topics such as the regulatory framework and the state versus Commonwealth responsibilities have been mentioned in this context.

The chamber believes that the Office of the Supervising Scientist should continue its well-established environmental programs, which were established specifically to provide knowledge on the effects of uranium mining in tropical wetlands. The chamber understands that the OSS was established to provide an expert technical service as a

regulator of the industry in the Northern Territory. The OSS was and is funded in part by a levy on industry.

The chamber believes that, at the time of establishment of the uranium industry in the Northern Territory in the late 1970s and early 1980s, the territory agencies were not in a position to supply the necessary technical expertise and regulatory infrastructure for the establishment of a large and complex uranium operation. The Fox inquiry, as you will recall, recommended amongst other things sequential development of uranium prospects in the Alligator River region. Therefore, had the Fox inquiry recommendations been taken up there was the prospect of a very much expanded uranium industry in that territory. The Office of the Supervising Scientist was established to act as a regulator and, to some extent, a research agent, a technical support service and auditor.

The chamber believes that considerable expertise has been developed at the OSS over the years of its operation, albeit that this expertise is narrow in its geographical, geophysical and hydrological scope. The chamber believes that there are fundamental and significant differences between uranium operations in the Northern Territory and uranium operations in other areas and states of Australia.

Two significant differences are that the Northern Territory mines are subject to monsoonal conditions. The greatest potential driver for environmental dispersion of radioactivity arising from the operations is the water pathway. The South Australia, Western Australia and Queensland government agencies have all had extensive experience in the regulation of mines producing radioactive products.

The chamber believes that any move to extend the role of the Office of the Supervising Scientist outside the wetlands would represent an unjustified duplication of existing regulatory services. The chamber believes that not only would the cost burden to the community be unjustified but also the level of service provided by the OSS may not match the existing expertise and regulatory systems operating in South Australia, Western Australia and Queensland. Therefore, there would be no substantive benefit to either the industry or the community.

Focusing on South Australia, the chamber contends that the state regulatory regime in South Australia has developed the necessary expertise following a long period of successful operation of the industry in this state. The chamber believes that this regime is well placed to perform the role of the regulator to an expanded industry in South Australia.

Just as the OSS has developed expertise related to its regulatory role in the wetlands area, so the South Australian state agencies have developed a specific body of knowledge, skills and experience related to their regulatory responsibilities associated particularly with the Olympic Dam operation. The South Australian experience is focused on the arid zone and is fundamentally different, as I have pointed out, from the wetlands

experience.

The chamber considers that measures of success of the South Australian regulatory regime are that there have been years of excellence in performance in the areas of environment and health safety at Olympic Dam. There are high levels of communication and cooperation between government, government agencies, the company, other stakeholders and the general public, and there is a general feeling in the community of confidence in the regulatory process.

You have just heard evidence from Western Mining as to the quality of their performance. I will not be going back over that evidence, although I have listed some in the supplementary submission, but I would point out that perhaps the excellence in performance culminates in two recent environmental excellence awards. One of the awards was the 1996 Australian Minerals and Energy Environment Foundation's environmental excellence awards for Western Mining's corporate publication, which you have heard something about, entitled *Environmental progress report 1994-1995*. As was previously explained, this document represents a form of public reporting. It includes a release of results from environmental audits which are available for public scrutiny. So this innovative company practice demonstrates the open dialogue that exists between various stakeholders in South Australia and is supported by the chamber.

The second of these awards was a recent award, the South Australian Resources Industry Award, for environmental excellence. Again, Western Mining won that for a particular project which involved innovative practice and the development of an innovative environmental code of management. This was particularly related to their borefield B project.

The overarching industry commitment to environmental excellence can be seen in the recent launch of the Australian Minerals Industry Code of environmental management. This, the chamber would argue, is the whole of industry context in which any development in the uranium sector in this state would take place. The chamber believes that these examples represent benchmarks for the industries and reflect a maturing relationship between companies, the regulator and the community. They are indicators of a healthy industry in this state. I believe positive community reaction, as I pointed out to the recent announced expansion of the Olympic Dam operation, is evidence of the confidence that the community has in the uranium industry in South Australia.

In terms of the national context, federal government policy provides the context for the regulation of the uranium industry. The industry nationally operates with regard to various standards, and mechanisms to facilitate federal policy include specific codes of practice, regulations and statutory requirements. Some of these include the code of practice on radiation protection in the mining and milling of radioactive ores, the code of practice on the safe transport of radioactive materials and the code of practice on the management of waste arising from the mining and milling of radioactive ores.

The Roxby Downs (Indenture Ratification) Act 1982 requires the operators of Olympic Dam not only to comply with the codes but also to adopt international and national recommendations pertaining to radiation safety as and when they are made. So, even though the current Commonwealth codes have been superseded by recommendations arising from the latest scientific research, the ODC is obliged to adopt recent findings and apply them to its operations.

Furthermore, in South Australia the network of agencies that regulate environmental matters include the South Australian Department of Mines and Energy, the South Australian Health Commission, the South Australian Environmental Protection Authority, the South Australian Department of Environment and Natural Resources, the South Australian Department of Health and Urban Development, the South Australian Department of Industrial Affairs and the South Australian Department of State Aboriginal Affairs. This whole of government approach to regulation of the uranium industry in South Australia provides for a coordinated model which ensures that no tension exists between the advocacy role and the regulatory role of the state and that all stakeholders have the opportunity to participate in the decision making process.

In terms of community responsibilities, ample opportunity exists in our view for the Commonwealth to provide input into the regulatory process. The environmental impact statement process represents a clear opportunity for the Commonwealth to provide input into that process, particularly through the Australian Radiation Laboratories—which is an arm of the Commonwealth department of health—and through the Commonwealth Environment Protection Agency.

Although the state has been identified as the most appropriate lead agent in respect of the EIS process, the guidelines for the EIS have been jointly developed by the Commonwealth and the state. The agreement between the Commonwealth and the state to enable the state to take the role of lead agent in the development of the EIS represents a further recognition of the local expertise appropriate to these projects and a commitment to removing unnecessary duplication of regulatory process.

New developments in South Australia may involve the application of different technologies and work practices to those currently being applied at Olympic Dam. For example, in situ leaching is proposed as the method of extraction for the Honeymoon and Beverley projects. The expertise for effective regulation of this process resides here in South Australia with agencies such as our Department of Mines and Energy and the Department of Health and Urban Development.

To expand briefly on community consultation as our final point, the web of community involvement in the decision making process related to new uranium developments includes the public consultation provisions of the EIS process, as I pointed out. Public consultation has become a feature of inclusive decision making, and various committees and consultative groups have developed that to relate to particular issues such

as water resources.

Stakeholders, such as Aboriginal people, pastoralists and local communities, all have the opportunity to comment and participate in the decision making process. Evidence of the development of community consultation in this decision making process can be seen in the emergence of groups such as the Lake Eyre Basin Steering Group Working Party Catchment Management—that is quite a mouthful—and the Great Artesian Basin Consultative Committee. The South Australian Chamber of Mines and Energy recognises the traditional rights and interests of Aboriginal people in land and promotes consultation between the industry and the Aboriginal groups to ensure these interests are respected.

In conclusion, the chamber supports further development of the uranium mining and milling industry in South Australia through expansion of existing operations and the development of new ones. The chamber believes that the industry has demonstrated its capacity to operate with regard to minimising environmental impacts and containing health and safety risks well within the standards set through federal policy and reflective of international standards. Likewise, the chamber has confidence that the South Australian regulatory regime has the necessary expertise and experience to protect the interests of all stakeholders and strongly resists any move to expand the role of the Office of the Supervising Scientist.

CHAIR—Thank you, Mr Goreing. Does Mr Harrington wish to add any comments, or do you simply wish to answer questions if asked to do so?

Mr Harrington—Yes.

CHAIR—In the interests of the efficient use of time, I will ask several interrelated questions and get you to respond to them. In your submission and also in your statement presented today, you lauded the experience and expertise of the South Australian government in monitoring and regulating the uranium mining industry in South Australia.

Firstly, is there any scope for improvement on the part of that monitoring and regulatory process by the state government? Secondly, is there any overlap or duplication between Commonwealth and state monitoring and regulation that could be eliminated?

Thirdly, the Conservation Council of South Australia and the Friends of the Earth in their submission have advocated that monitoring and regulation of uranium mining and milling be undertaken under nationally uniformed standards, which one may infer involves transferring all of the monitoring and regulating to the Commonwealth agencies rather than state agencies. I was just wondering whether you could respond to those three interrelated questions.

Mr Harrington—Can I start with the national standards. While there are different state regulations, radiation safety acts, mining acts and so on, the fundamental health and

safety standards, if you like, relating to radiation are national. The dose limits that are endorsed by the National Health and Medical Research Council are only one part of the nationally recognised radiation protection regime, which can be traced back to the International Commission on Radiological Protection. So there is not an inconsistency between states on such issues as radiation dose limits or, indeed, the fundamentals of radiation protection. There are minor differences in the application, the reporting requirements and so on between states, but there is no fundamental difference between the standards in each state.

There is not a great deal of regulatory duplication between the Commonwealth and the states, mainly because there is not a Commonwealth radiation safety act as such. The codes of practice, while they are developed under the Commonwealth umbrella, take effect only if the states pick them up in their regulations or apply them as conditions of licence. There is not a Commonwealth act as such which has foreseen mistakes. So, in terms of the regulatory regime, there is not a duplication from that point of view. The codes are administered by the states even though they are developed under a Commonwealth umbrella.

Having said that, the codes committee is composed of representatives of all the states and territories. They all have input into the development of the codes. Whether there could be an improvement in the regulatory regime, I imagine there would be. I cannot imagine any system that is perfect. I believe that through the many years of the networking that goes on between state agencies, both within a state and across the borders into other states and territories, certainly in the 15 or so years that I have been here, we have all learnt a lot and, hopefully, we will continue to learn.

The new codes of practice, once the Commonwealth establishes the mechanisms under which those will be written, will be an improvement on the old ones. So, yes, I believe there is always scope for improvement.

CHAIR—Accepting that there is always scope for improvement, are there any particular issues or areas that you believe need improvement?

Mr Harrington—In terms of regulation, probably I could not put my finger on a particular issue but I do believe that an area that has been emphasised in some of the other submissions that I have heard today and which is part of the regulatory framework that comes through the codes of practice from the international recommendations that I believe needs more work, more research, more thought, is the whole question of ALARA and how one applies it in practice. There are different theoretical ways of looking at ALARA but the pragmatism of how one goes about it needs more in-depth thought and time. How one then translates that into regulation is a following step. That is one specific example.

CHAIR—Does the chamber see any value in the establishment of a permanent national register of people affected by radiation in their employment?

Mr Harrington—Yes and no. The establishment of a national register could be of use for two reasons. One is that currently the states and the territories hold the radiation records of employees who have left the employment of one company. If that employee moves across a border and takes up employment with another company, or indeed a medical practice or anywhere where they might be exposed to radiation as part of their job, it is up to the receiving state to obtain the radiation records from the state or territory where the person was before.

That mechanism actually does work. It may not be as reliable as a national register; therefore a national register has some merit. However, in the early discussions that took place about the establishment of the national register, they were really in the context of a permanent repository of information for epidemiological follow-up and there I have some problem about the reasons for the establishment.

It is extremely unlikely—and some research was published quite a number of years ago—that any future epidemiological study will find concrete evidence of the results of exposure at the sort of radiation doses that people in the mining industry are commonly exposed to. It is a statistical fact that it is going to be extremely difficult and probably unlikely.

For those people who want it to be otherwise and would like the establishment of a registry in order to provide that information, I do not think they are going to get the information out of it that they might expect by the establishment of a national registry.

Senator MARGETTS—I take deep offence at the terminology ‘for those people who would want it to be otherwise’. I am not sure exactly which people you are referring to, but I do not think there is anyone that I can think of in the community who would want people to be affected by long-term exposure to radiation. I just thought I would tell you that I found deep offence in that statement.

CHAIR—I do not think that that was what was being implied by the witness.

Mr Harrington—I do beg your pardon. I did not mean it that way.

CHAIR—I think he was saying that you would want the records to be verifiable in some way. I think that is what you were referring to, Mr Harrington, was it not, rather than wanting people who suffered damage from radiation?

Mr Harrington—Yes. I do apologise. I did not mean to imply what you have just said. What I am trying to say is that, having established a body of records, there are people who think that those records will supply concrete evidence of deleterious effects. I do not think, on a statistical basis, that that body of evidence will show that.

Senator MARGETTS—Mr Harrington, are you aware of studies that have been

done, and I personally would have to get you the specific notification? I have been advised of a growing number of studies that have indicated that long-term exposure to even low levels of radiation are now showing statistics that are surprising a larger proportion of the scientific community. Are you aware of any such studies?

Mr Harrington—Yes. The pathway from the epidemiological studies to the Australian situation through things like dose limits and through the international recommendations start with those studies. They start with the evidence from the survivors of atomic bombs. There are many different studies into radiation accidents, medical studies, medical use of radiation and, indeed, at environmental levels, studies into populations exposed at levels greater than the global average—people living in certain parts of Brazil and India. So, yes, I am aware of those studies.

Senator MARGETTS—It is hard to reconcile those emerging studies with your statements of certainty that worker and community exposure gauged through longer term epidemiological studies would not reveal any inclinations.

Mr Harrington—It comes down to a matter of the cumulative exposure of the people—people living in these areas of Brazil and India and so on where they have done these long-term studies—who are exposed daily to levels higher than our uranium miners get. It is a difference. It is a cumulative dose that I am talking about. The cumulative dose that our miners are likely to get from working with uranium in Australia does not compare to the cumulative dose that these people living in high background areas will get.

Senator MARGETTS—Do you operate according to the linear dose hypothesis?

Mr Harrington—Yes.

Senator MARGETTS—You do?

Mr Harrington—That is how our regulations are written.

Senator MARGETTS—They are, but you would be aware that there are many people who have it in the medical field as well.

Mr Harrington—There are both above and below the line but they are not taken into account in setting of regulations or in operating mines.

Senator MARGETTS—Yes, I know, but the level of regulation for mines is a different issue, if you like, from the ability to gauge the long-term medical impact of even low level radiation.

Mr Harrington—One is regulation and the other is science.

Senator MARGETTS—The studies I was talking about even refer to what is considered to be low level radiation.

Mr Harrington—May I just also say that the other problem with the statistics of epidemiology is that we have low numbers of people exposed in our minds compared to the large populations one would need to study for the statistical reasons. In other words, it is a low dose to a low population, a small population, whereas in many of the studies which are managing to find evidence, there is a higher dose to a larger population. That makes the needle in a haystack search easier statistically.

Senator MARGETTS—Perhaps we would be able to add to the growing body of information from other countries.

Mr Harrington—Maybe.

Senator BISHOP—The cumulative doses of those people exposed in those communities in Brazil and India you said were higher than the cumulative doses that would be experienced by workers in the affected industry in this country. Do you have any information on the actual levels and hence the differences?

Mr Harrington—In Brazil and India?

Senator BISHOP—Yes.

Mr Harrington—I could get them for you; I do not have them with me.

Senator BISHOP—Do you know the ballpark we are talking about, off the top of your head?

Mr Harrington—No. They are higher. In Kerala state in India, which is affected by the thorium in monazite sands, the average annual dose to individuals is 4.9 millisieverts. If you talk about a whole of life dose at 4.9 every year, that is the cumulative dose, whereas for a uranium miner in Australia—I do not know how long an individual miner might work in the industry—our annual doses are lower than that and the cumulative time is certainly less than a lifetime.

Senator MARGETTS—Annual doses are said to average about five millisieverts, aren't they? That is what we have been told by industry.

Mr Harrington—Well, 2.7 was the average dose for the Olympic Dam miners. I am afraid I do not have the average doses.

Senator BISHOP—A cumulative dose of 4.9 millisieverts over a lifetime is still very, very low?

Mr Harrington—Compared to what?

Senator BISHOP—Compared to international standards.

Mr Harrington—Yes. The international dose limits apply to the additional dose, not the dose plus the background. This is a dose that is delivered naturally and there are no dose limits that apply.

Senator BISHOP—This is background doses, not from working in the—

Mr Harrington—No.

Senator BISHOP—I am sorry.

Mr Harrington—This is simply living in Kerala state.

Senator BISHOP—I thought it was workers in the mines in that area.

Senator MARGETTS—I think it was Ranger that gave us the figure of five millisieverts.

Mr Harrington—For their operation?

Senator BISHOP—The natural background level in those communities is of the order of five?

Mr Harrington—Yes.

Senator BISHOP—I understand.

Senator MARGETTS—You have mentioned in your statement the Australian Radiation Laboratory as an arm of Commonwealth regulatory process. What is the chamber's view on the performance and effectiveness of the Australian Radiation Laboratory?

Mr Harrington—I am not sure whether the chamber itself has had a great deal to do with ARL. I have worked alongside ARL in my working time in Australia very closely; ARL has done some extremely good basic research at uranium mines by sending out field teams and they have published many papers on radon and gamma radiation. They are working on some dust. They also hold one of the very few radon research facilities in Australia. A number of very excellent publications have been produced by them on the measurement of radon, the control of radon, as it relates to uranium mining.

Senator MARGETTS—Do all your members fully utilise the Australian Radiation

Laboratory for their monitoring and standards?

Mr Harrington—The Australian Radiation Laboratory does not offer a full monitoring service. They currently offer a commercial service for gamma radiation through the thermo luminescent dosimeters. They do not offer a similar service for either dust or radon daughters. I think all the uranium mines and, I believe, the mineral sand mines use the TLD service, and everybody does their own radon daughter and dust.

Senator MARGETTS—Are you aware of the fact that at Roxby Downs the use of TLD badges is optional to the workers?

Mr Harrington—In some areas, yes, it is.

Senator MARGETTS—To designated workers, the use of TLD badges—

Mr Harrington—Yes, it is, and I am aware of that.

Senator MARGETTS—Why is it that that is not used or seen as a company principle? Are you aware that any companies do not have confidence in the Australian Radiation Laboratory's methods or processes or systems?

Mr Harrington—I am reluctant to speak on behalf of WMC because I was not part of the decision making process that made TLDs optional. However, I am aware that the gamma doses to many individuals who work on the surface are very low; they are within one or two millisieverts per year for most of their employees. Under those circumstances the doses can be reliably predicted; there are no mechanisms for dose change in many areas of that plant. Therefore, the repeated measurement of the same dose per year would seem, if not unnecessary, then at least a duplication of existing information.

Senator MARGETTS—At Ranger it would seem, though—using another mine as an example—that an average of five millisieverts could mean that some receive two and some receive eight. Without wearing the badge or having individual monitoring devices, how would people know that they had actually received above or below the average?

Mr Harrington—I think the answer to that, certainly for gamma radiation, lies in the historical records, the years of operation. If you classify the areas of the surface facilities into areas such as major geographic locations, the gamma radiation in those areas is very predictable and there are no mechanisms to change that suddenly or without knowing that it is going to change.

Senator MARGETTS—But it would be important to a worker to know whether they were generally on a regular basis getting eight whilst other workers on a regular basis were getting two?

Mr Harrington—Yes. I believe that, while the wearing of individual TLDs is now optional for some worker categories, it is always the case that some workers in those categories would wear badges. That is monitoring by worker category, which is a perfectly acceptable descriptor of everyone in that work category. So there is audit monitoring—

Senator MARGETTS—Sorry, perfectly acceptable to whom?

Mr Harrington—Scientifically, statistically. If you look at the underlying distribution of doses, then audit monitoring is an acceptable scientific way of describing the underlying population.

Senator LEES—One question relating to the South Australian parliamentary inquiry and part of one recommendation: they recommended that the minister here consult with Olympic Dam operators and relevant government agencies with the view to establishing a system of periodic, independent, external environmental audit arrangements in relation to Olympic Dam. Would you like to comment on that? How does your chamber feel about that recommendation?

Mr Harrington—Sorry, I missed that.

Senator LEES—The recommendation was that there be established a system of periodic, independent, external environmental audit arrangements—in other words, not to leave it just up to the company but to look at a more independent process. How do you feel about that?

Mr Harrington—I feel that the move towards an environmental management system along the lines of ISO 14,000—and waiting in the wings is ISO 18,000—is to be applauded, partially because, through that environmental management system process, there is extensive provision for third party audit. You will not get accreditation and you will not maintain your accreditation unless the third party auditors are satisfied. I would applaud that sort of move.

Mr Goreing—The industry as a whole was consulted in the development of the code mentioned earlier which, as I pointed out, is the context in which this industry operates. That code reflects what my colleague has been saying about the drive towards the EMS and the adoption of the ISO 14,000 standards. Again, the chamber would be very much supportive of those principles and, again, would be applauding of them.

Senator FERGUSON—When we heard from General Atomics this morning, I think they were projecting 11,000 tonnes of uranium oxide over the life of their mine. Yet you say in your submission:

Honeymoon is believed to contain about 2 million tonnes of 0.16% grade uranium oxide and Beverley about 6 million tonnes of 0.27% grade uranium oxide.

How does the figure of six million relate to the 11,000 tonnes of uranium oxide?

Mr Goreing—I am sure it does. Perhaps the definitions of concentrate as opposed to grades of ore may well explain it. I am sure General Atomics would be able to provide you with a more satisfactory explanation. Likewise, in the various journals there are some published articles on those figures from which I actually quoted, so I can supply you with more detail. But that would be my initial feeling.

CHAIR—As there are no further questions, thank you, Mr Goreing and Mr Harrington, for appearing before the committee this morning. If anything comes out of our further deliberations, we will contact you in writing and seek a written response. Thank you for being with us this morning.

[12.45 p.m.]

MATTHEWS, Dr Dennis Brian, Chair of Nuclear Issues Action Group, Chair of Economics and Energy Working Group, Conservation Council of South Australia, 120 Wakefield Street, Adelaide, South Australia

NOONAN, Mr David Joseph, Campaign Officer, Australian Conservation Foundation, 120 Wakefield Street, Adelaide, South Australia

VORONOFF, Mr Daniel David, Member, Friends of the Earth, National, Melbourne, Victoria

CHAIR—Welcome. Thank you for appearing before us. Do you wish to make an opening statement before we proceed to questions? I just remind you that one member of the committee has to catch a plane and a couple of others have to go to a funeral, so we are wanting to get away as near to 1.15 as possible, so if you can keep your opening statement as brief as possible to allow maximum time for questions.

Mr Voronoff—We have an opening statement each, and I will explain that in due course. I wish to extend our thanks, on behalf of FoE and the Conservation Council of South Australia, to the Senate select committee for allowing us this opportunity to address this hearing. Also I wish to express apologies on behalf of Mr Stephen Baker, who is the co-author of the CCSA-FoE submission, for not being able to attend this hearing. Unfortunately, Mr Baker is meeting commitments made prior to notification that the committee would be hearing in Adelaide. Due to circumstances beyond his control, he has been unable to reschedule these commitments and he apologises.

As you are aware, ours is a joint submission between FoE and the CCSA. My colleague Dr Dennis Matthews will be addressing the hearing on behalf of the CCSA. Friends of the Earth Nouveau is an Adelaide based, non-government community environmental organisation. It is a member of Friends of the Earth Australia, which is a national network of 11 groups and two regional spokespersons in Alice Springs and Marree. Friends of the Earth Australia is also active at local, regional and national levels. It is also a member of FoE International, one of the world's largest such non-government environmental groupings.

FoE and CCSA are opposed to all aspects of the nuclear fuel cycle: uranium exploration, mining, milling, processing and export, nuclear power; nuclear weapons construction and testing; the use of nuclear reactors for research and for the production of radioactive isotopes; and the mining, milling, processing and exporting of radioactive materials, including thorium and rare earths.

FoE and the CCSA strongly support the minimisation of radioactive wastes, minimising the use of ionising radiation, including X-rays, minimising the use of

radioactive isotopes, environmentally benign alternatives to nuclear power and the implementation of end-use efficiency programs, these being the most economic and ecologically efficient means of displacing greenhouse gas emitting infrastructures.

We fully endorse the need for this inquiry. It is 20 years since the last major inquiry into this subject. Since then there have been two major reactor accidents: Three Mile Island in 1979 and Chernobyl in 1989. There has been a sharp downturn in the uranium market and the release onto the world market, that is, both open and black markets, of weapons grade uranium and plutonium. As we speak, a ship bearing several tonnes of plutonium is traversing the ocean and will be passing seas in our region as it makes its way from France to Japan. This extremely high risk procedure is the inevitable consequence of the nuclear fuel cycle as the nuclear industry tries vainly to store, dispose of or re-use its lethal by-products.

In considering the terms of reference, FoE and CCSA have submitted evidence to the committee that, first, supports recommendations to phase out uranium mining; secondly, supports the need to commence the rehabilitation of mine sites and other regions affected by mining immediately upon cessation of mining; thirdly, supports the need to undertake effective minimisation of risk to radiological exposure posed to mine workers and communities adjacent to uranium mines; and, fourthly, shows Aboriginal communities have not been adequately consulted with respect to mining developments, including and especially the Olympic Dam operations at Roxby Downs.

The evidence, commentary and recommendations fall into the following categories: tailings management, water management, effectiveness of environmental protection standards, role of the OSS, workers' health and safety, and consultation with the Aboriginal communities of the region. I shall reiterate for the benefit of this hearing brief statements relating to water management, environmental protection, the OSS and Aboriginal consultation. Dr Matthews will make statements in relation to tailings management and workers' health and safety.

Dr Matthews—Again I would like to thank you for this opportunity. Is it rather difficult for the environment movement to participate in these sorts of things because, unlike many of the people you heard today, we do not get paid for coming to these sorts of things. In order to pay for our voluntary activities, we usually have to work. So, essentially, what you are getting is people who are either unemployed or, like myself, retired. As you notice, there are practically no women appearing so it tends to discriminate against women. Perhaps in the future you might take those things into consideration.

Again, thank you for this opportunity. We would like to return the favour and invite all the panel to our public inquiry. It will be something like this, but, obviously, different. You could all take one of these invitations to our inquiry to be held on 8 and 9 March in Adelaide. We would also like to have the addresses of the other people involved in your inquiry so that we can circulate these invitations to them as well.

Perhaps I ought to start off by saying a little bit about myself. I am a scientist by training and have degrees from the University of Western Australia, BSc (Hons), and a PhD from the University of Pennsylvania. In the honours project and in the PhD project, I worked with radioactive materials, radioactive iron and radioactive tritium. So I have had experience, although at the time I had no inkling of what that experience implied.

Since coming to the Flinders University, where I was for 24 years before retiring last year, I was the radiation safety officer for the School of Physical Sciences, which encompasses both physics and chemistry at Flinders University. I was also on the Radiation Protection Committee in South Australia for a number of years. My activities include not just research and teaching in the area of physical chemistry, particularly solar energy and energy in general. I also take an interest in all energy issues at all levels, including policy, and all aspects of nuclear issues.

In general, I support everything that was said by Daniel here in terms of how I and the Conservation Council are opposed to all aspects of the nuclear industry. I do not think there is really time to go into the details of why our opposition is so strong, but you are probably aware of why by now.

There are a couple of things from our submission that I want to stress. Health and safety are highly relevant to this inquiry. I would like to emphasise that the data—which is well known by now—about the exposure levels that workers can be exposed to has changed over the years. In other words, as our knowledge has improved—and, generally speaking, knowledge improves exponentially—so we have understood more and more about the dangers and there has been an exponential decrease in the allowable dose.

Because there is an exponential decrease, it is very much like radioactive decay in fact, you can characterise it by what is known as a half-life—that is, the time taken for the amount of radioactivity or, in this case, the radiation dose to decrease to half its value. As I have shown in our submission, that typically is of the order of 12 to 14 years. So what has happened in the past—and there is no reason why this trend should not continue—is that on average every 12 to 14 years we can expect a halving in the allowable dose that workers and the public can receive.

We have seen this effect at both the Ranger and the Roxby mines. In their life time the allowable dose has decreased by more than a factor of two, pretty much overnight, so that one year our workers were allowed 50 millisieverts and the following year they were allowed only 20 millisieverts. We are suggesting that this trend, which is undeniable, should be taken into account. In other words, if a mine is going to last for 20 years, then you should say, 'At the end of that 20 years, it is highly likely that the allowable dose will not be what it is now. It will be half or even a third of what it is now, so we should plan accordingly.' If not, I think that leaves the governments and the companies liable to action similar to what we had with asbestos.

We are concerned that the industry, in general, is using a worker rotation basis to try and decrease their doses. Because the allowed dose is continually falling, you have to do something either in terms of better circulation of air or better shielding of the workers to decrease the allowable dose. Instead of doing that, the industry is going for this rotation of workers. They have a euphemism for it—they have called it multiskilling.

What it means is that you can put a worker in a highly exposed position, and where normally they used to have only one worker, now they put three or four and then give them something else to do, so their exposure never gets over the allowed limit. We think this is intrinsically wrong because we know that it is the total dose that that working population receives, not the dose to one particular worker, that affects the total risk.

If I could just put that more vividly, as I did a number of years ago at a meeting at Roxby Downs, if you take a mob of sheep—and at that time they were killing sheep left, right and centre because there was a great surplus of them—and you fire into that mob of sheep you are going to hit one sheep—although not necessarily kill it. If you double the size of that flock and fire a shot, it is still highly probable that one sheep will be affected. It is the same with workers. Doubling the size of the work force, doing a job which only requires half that number, does not affect the overall chance of some medical problem. You can perhaps ask me more if you want to make that clear, but that is a really important issue.

CHAIR—We understand what you say.

Dr Matthews—On environmental damage, we are very concerned about what has happened at Roxby. The industry keeps telling us that things are getting better and better and that they have learnt from their mistakes in the past and that what happened at Ranger, Radium Hill and Rum Jungle was in the bad old days and things are getting better. But no sooner do they make a statement like that than we find a massive leak of toxic radioactive material from the tailings dam of the best resourced mining company we have in Australia, Western Mining. RTZ-CRA is now bigger than them, but they were the biggest at that time. They are highly resourced, presumably highly competent, and yet under the eye, under the guidance, or under the supervision of the state government—the mines and energy department in particular—these things still occurred.

So we would just say, ‘Don’t accept this idea.’ If you accept the idea that things are better and that these things will not happen, then you are going to overlook a lot of things. So we say, ‘Be more vigilant. Don’t accept that idea.’

We are concerned about the proliferation aspects of uranium mining. That has been reinforced today because recently it has been announced that Roxby has got an export contract to France. France is the best known of our nuclear-agro countries—and China is the other best known one—that are actively pursuing nuclear weapons programs. They are not the only ones. The USA and England are still pursuing a program, and they are

countries that we are exporting to.

There is no way of dividing up that material that we export to those countries into stuff that goes into weapons and stuff that goes into power stations. We have no control over it, except on paper. On paper you can say, 'Okay, all of our uranium will go to power stations and none will go to weapons.' In actual practice there is no way you can prevent our material going into nuclear weapons in France or wherever we export it to—the US and the UK at the moment.

We are concerned about the situation nearer to home and the countries we are going to be exporting to. Indonesia is one we are particularly concerned about. There have been a number of concerns expressed by much better known people than myself—people like Bill Hayden—in the past about Indonesia's ambitions in nuclear weapons, and yet we are discussing with them the possibility of exporting uranium to their country.

A lot has been said by organisations like the Chamber of Mines and by Western Mining about public consultation. The fact is that there is an EIS process occurring now. A draft EIS has yet to be prepared—it is coming out in April—and yet if you look at advertisements run by Western Mining in the papers for personnel, they say the expansion will occur.

They can say that simply because an indenture agreement has been entered into between the state government and Western Mining. It is a *fait accompli*. Yet they would like us to believe that we are being consulted. I liken the situation to the story about the mushroom—being kept in the dark and fed on manure. And then, in the case I am talking about, you get enlightened at the moment just before your life is extinguished. I see these organisations holding us, the mushrooms, up and saying, 'Well, what would you like to know?' just after they have cut our heads off. That is rather a dramatic analogy, but it nevertheless exemplifies the situation that we have, in particular with Western Mining and with the nuclear industry in general.

Mr Voronoff—The committee is aware that close to the borefields used by Roxby for water extraction are a number of artesian springs known as mound springs. These naturally occurring wetlands are formed when fossil water from the Great Artesian Basin is vented at the ground surface. Springs are isolated habitats, forming an archipelago of aquatic islands in an arid sea. They are, in fact, oases in the desert.

Many individual springs and spring complexes exhibit a high degree of endemism, often at higher taxonomic levels such as genus, family or order. The springs are shallow and often small in area. Without an adequate flow of ground water they would rapidly dry up and be irreparably damaged. The committee is also no doubt aware of current rates of water extraction by the mine in the Great Artesian Basin, which is between 12 million and 15 million litres of water per day.

It was anticipated that water extraction from borefield A would affect local mound springs. According to the draft EIS, the nearby Venable Spring was expected to dry up completely, while three other bores would be reduced by 80 per cent. The removal of fossil water from the Great Artesian Basin by WMC has indeed been implicated with draw down effect in water levels, resulting in the possible drying up of some mound springs.

The effect on local mound springs has been much greater than was anticipated in the EIS. Two mound springs complexes, Gosse and Fred, were destroyed during the sinking of monitoring bores. Since operations began, Beatrice Spring has almost dried up and two others, Venable Spring and Priscilla Springs, have completely dried up.

WMC's proposed expansion to 150,000 tonnes per annum copper will require the development of a new wellfield named borefield B, as a source of water. The project assessment of environmental impact report 1989 stated in relation to the proposal for the borefield B that the development as proposed had not been demonstrated to be acceptable at that stage. It was given approval on a conceptual basis only. It was recommended that a comprehensive environmental survey be undertaken with special attention given to the mound springs and Lake Eyre heritage area. Nevertheless, a new state-run process for the assessment of the environmental impact of wellfield B was endorsed by the South Australian cabinet in November 1994.

Despite the proven impacts on the mound springs in the vicinity of borefield A, the operators were given the necessary approvals. Furthermore, the location, which was earmarked by the operators and subject to the public environmental assessment process, was not the final location chosen for the site of borefield B. While the concept of wellfield B was discussed in the EIS, the environmental impact could not be fully assessed as the location had not been finalised.

This situation is the second known major instance where WMC has been given the necessary state government approvals to significantly change a program after public environmental assessment has occurred. The first was the changes to the tailings dam system, which resulted in the tailings leak. Are we see a repeat performance in terms of the maximising of environmental hazard due to inappropriate state government regulations and approvals and mismanagement by WMC?

These instances clearly indicate the need for an independent monitoring body and a more active Commonwealth involvement in the environmental impact assessment process. The combined effect of borefields A and B will mean that the Great Artesian Basin could be drained at a rate of up to 42 million litres per day for the next 40 years. WMC will be getting every litre of this water for free. No fee is obtained by the state for the mining or use of this valuable public resource. This flies in the face of cost recovery and user-pays principles underpinning the national competition policy. It is also in direct conflict with the state water plan and water reform program.

The Olympic Dam operation is governed by the Roxby Downs (Indenture Ratification) Act 1982. Clause 34 of the act is the non-discrimination clause which prevents the state government from imposing on the venturers virtually any condition, including environmental requirements or radiation protection measures other than those specified in clause 10 of the indenture. The government is thus effectively prohibited from imposing more stringent standards of radiological protection from bodies such as the US Environmental Protection Agency, the Nuclear Regulatory Commission and Britain's National Radiation Protection Board.

Clause 35 of the indenture prohibits the government from making public any information pertaining to the indenture—in particular, the results of the environmental monitoring of the project. Thus, public access to critical information is not guaranteed. This is a parlous circumstance in a democratic nation in this day and age. This act shamefully flouts all the principles and expectations our community has for accountability and transparency in public affairs, especially in matters that can have serious implications for community health and the environment. This assertion is consistent with the ERDC inquiry into the massive tailings leakage, an inquiry which clearly acknowledged that the Roxby operations needed to be more open to public scrutiny.

Senator MARGETTS—May I just interrupt very briefly? We are going to lose our quorum in 10 minutes.

CHAIR—I was going to suggest that a subcommittee be formed for a further 10 minutes beyond that, until 1.30 p.m.

Senator LEES—That is fine, but we are running out of time.

Mr Voronoff—That is fine; we can take questions if you wish.

Senator LEES—Could you summarise what else you have to say, if possible?

Mr Voronoff—I will move to our argument for the role of the Supervising Scientist. The other issue addressed by the ERDC inquiry was the desirability of the South Australian Department of Mines and Energy having prime responsibility for environmental matters in relation to the mine's operation. As we have seen, the fruit borne of the relationship between the South Australian DME and WMC has been the disaster of the tailings leakage. This raises questions of the advisability of such liaisons to the exclusion of a direct regulatory capacity for agencies dedicated to environmental protection.

It is our opinion that, to ensure national uniformity in the environmental regulation and management of uranium mining and milling operations, the authority of the Office of the Supervising Scientist should be extended to all uranium operations, including Roxby. Past environmental disasters and sleight of hand in relation to environmental assessment procedures require the establishment of an independent, well-resourced, dedicated, long-

term monitoring agency. It is entirely in keeping with the 1990 Taylor review of the OSS that the OSS assume responsibility for the monitoring and supervision of the Roxby Downs uranium mine to provide for independent monitoring of the mine's activities.

CHAIR—Thank you. I have a few quick questions. Firstly, having looked at your recommendations, I note that a number of them appear to be a direct lift from recommendations made by the Senate Select Committee on Radioactive Waste, which I also chaired and which was a predecessor to this committee.

Mr Voronoff—Yes. They were rather good, so we thought we would use some of them.

CHAIR—I just wondered why, given that they have already been a recommendation of the committee, you have used them as recommendations to this committee.

Mr Voronoff—Because it was not obvious that it applied to uranium mining. It appeared to apply to material further down the road.

CHAIR—Secondly, with regard to the recommendation which you have made about the Office of the Supervising Scientist having a role beyond its current role in the Northern Territory, would you accept that the particular expertise of the Supervising Scientist is with regard to wetland tropics? Therefore, what relevance does their expertise have beyond that area which they currently have involvement with?

Mr Voronoff—This clearly is a result of the restriction of the OSS activities to the Alligator River region. If the field of the OSS were expanded, it would be necessary to resource it and fill it with personnel, to the extent that they would be able to cope with monitoring uranium mines throughout the country. That would be a fundamental prerequisite; so whether or not it is regarded that the OSS has personnel whose expertise is only for the Alligator River region is in some ways irrelevant. Provided that they are well resourced and are provided with adequate personnel to cover all regions, the OSS would, hopefully, provide an adequate independent monitoring body.

The proceedings of the committee having been interrupted by interjections from the public gallery—

Senator FERGUSON—Mr Chairman, I suggest the committee adjourn.

CHAIR—Yes, so do I. The committee stands adjourned and will reconvene shortly.

Short adjournment

[1.55 p.m.]

ACTING CHAIR (Senator Margetts)—I would like to thank you for staying around. I am reconvening what is now a subcommittee of the Senate Select on Uranium Mining and Milling. I would like to thank the Friends of the Earth Nouveau and the Conservation Council of South Australia for their patience and those other people who have stayed with us, including the staff, whilst we dealt with the situation.

Before we start, I did make a promise to the group who has now allowed us to continue without disruption that I would put their concerns on public record. I will be taking them to the committee but I will just read them into *Hansard*. Their concerns were that they had made a submission and that they had a long history on the issue in this state, but they were not invited to give a verbal submission. The group were from the South Australian Greens. They said they were not informed that the hearing was coming to Adelaide. They in fact said they had asked whether it was and told that it was not. So they were concerned and angry that they found out only by the media this morning.

They were concerned about the discrepancy of time allocated between the committee's access to industry versus the committee's access to the community. They were concerned about comments by the chair on the media in support of the industry line and they also indicated that Bruce and Meg from their group had further information re the Great Artesian Basin in relation to work by John Hoare, who is now deceased, who has utilised some of the work by Professor Habbermile, who is located in Canberra with the CSIRO.

I indicated to them that they could still provide us with further information in relation to the Great Artesian Basin as it is information which has recently become available to them and relates to some of the questions we have been asking today in the hearing. So having fulfilled my promise, welcome again. If there are other statements that restricted you because of time, please briefly give those now.

Mr Voronoff—Thank you very much. I would like to make a brief statement relating to Aboriginal communities affected by the eventuality of the uranium mine on their country. Many Aboriginal people have voiced disapproval over the activities of Western Mining Corporation. Two local communities, in particular, the Kokatha and the Arabunna, have raised concerns about damage done to their sacred sites and about inadequacies in the consultative process between WMC and Aboriginal people. The Kokatha are traditional owners of the region where the mine is situated and the Arabunna have ties to the mound springs area where WMC extracts water from the Great Artesian Basin.

Some of the social and cultural impacts upon Aboriginal communities include the following. Firstly, the lease arrangements established by the indenture prohibits the Kokatha people access to sacred sites except in the presence of company personnel,

thereby violating the sanctity of these sites. Secondly, so far numerous sites have been destroyed, including one which has been desecrated by the main shaft of the mine. Thirdly, the mound springs are of very high cultural significance to the Arabunna people. As discussed earlier, these unique habitats are threatened by WMC operations. Fourthly, WMC has consistently avoided serious consultation with Arabunna people. Fifthly, WMC have paid anthropologists who have drawn up territorial boundaries which appear to favour Aboriginal groups supportive of the company. Sixthly, WMC has helped set up and resource Aboriginal groups favourable to WMC.

It appears WMC has supported the establishment of small Aboriginal groups that have challenged the rights of the Kokatha and Arabunna peoples. It is believed WMC has provided some groups with financial aid and vehicles. It is believed that these groups have been established and promoted as official representatives in order to promulgate the appearance that WMC is going through the legal process of consultation, while in fact ignoring legitimate concerns.

It is these series of relations that may have created the tensions amongst Aboriginal communities in the region that led to a riot in Marree in January of 1995. The riot resulted in one death and several people being badly injured. Appeals by environmental groups and the Arabunna people to the federal government to hold an investigation into this violence appear to have been ignored. CCSA and FoE believe that a more open, inclusive and independently arbitrated consultation process is required. I thank the committee.

ACTING CHAIR—Thank you very much. Are there any further statements that either Dr Matthews or Mr Noonan would like to make?

Dr Matthews—No.

ACTING CHAIR—I have made a major request to both the Conservation Council of South Australia and Friends of the Earth Nouveau; I think particularly Dr Matthews was here through the rest of the evidence today. A number of statements were made by Western Mining and by the Chamber of Mines which may well be seen to address a number of the concerns that have been mentioned about water usage, health and safety, dam leakage or seepage, environmental approvals, level of consultation and so on. I am wondering if the most helpful thing might not be for you, through either your notes or the *Hansard* from today's hearing, to look through those comments by Western Mining and by the South Australian Chamber of Mines and make any comments if you think there is any clarifying information or if you have a dispute with any of the information that was given in relation to those issues.

Dr Matthews—So you will send us the submissions that were made today?

Senator LEES—Today's submissions should be available now.

ACTING CHAIR—Could we provide those by post as a matter of urgency? If it is acceptable to you could you give us, as a committee, feedback on that information?

Senator LEES—I would just put on the record that we are aware of the limits on your resources and the recent financial cuts that have been made, particularly to the Conservation Council's budgets, and we thank you in advance because we realise how difficult it is for you to get this work done with such limited resources.

On page 3 of your submission, recommendations 6, 7 and 8 relate to the Great Artesian Basin: to the mound springs and particularly to borefield B. Could I ask you for any background information you may have regarding the impact to date on the mound springs of borefield A? Do you have any documentary evidence?

Dr Matthews—The expert on this is Steve, but David has also got some background material.

Mr Noonan—I would be glad to submit material. I am not in a position to speak to it at present.

Senator LEES—It would be more than helpful if you could do that for us, along with the other information you are going to give us. When you say in recommendation 6 that you are looking at borefield B, is this in regard to where the new borefield B is now to be situated?

Dr Matthews—Again, that is Steve's area, but my understanding—maybe you can correct me—is that there is already a borefield B and it is already pumping. It is all a fait accompli as far as I am concerned. Is there another borefield B?

Senator LEES—No, I am just looking at comments that have been made relating to the fact that the site of borefield B was changed after the public approval process.

Dr Matthews—That comes from Steve. Are you able to say anything about that, Steve?

Mr Voronoff—The public process—the EIS—was only able to approve borefield B on a conceptual basis because no detailed survey evidence was submitted to the EIS to enable approval outright.

Senator LEES—I understood what was on the table at the time of the consultative process was that the site was about halfway out from between A and B, where B is now situated.

Mr Noonan—That is correct.

Mr Voronoff—The substance of the matter is that it has changed.

Mr Noonan—Even in regard to the current location of borefield B, the matter of particular importance is the designated boundary of borefield B, which is the area under state legislation, at which the state government monitors the drawdown effect that Western Mining induces on the Great Artesian Basin.

In the survey and assessment report for borefield B—a state government process, not an environmental impact statement—there was a particular boundary nominated by the company and by the government as the one that would be approved. It was on that basis that the public made submissions and comments to that survey and assessment report. Soon after submissions closed, the company approached the government to dramatically change the location and the size of that boundary—in effect, to double the area that was enclosed within the legal boundary.

I would note, for your interest, that within this boundary there is no legal limit on the draw-down effect caused on the Great Artesian Basin. The only legal limit on draw-down effect is measured at the boundary periphery. So, it was a situation where Western Mining had gone to the public with one proposal, and then, after a public scrutiny of sort had been completed, they had gone to government with a second proposal. Government granted licences to Western Mining on the basis of the subsequent proposal and they were passed into law and approved. The public was not, at any time, informed of the changes.

Senator LEES—Perhaps I may have further comments once you have submitted the additional material, but could I follow on the public consultation issue. Western Mining has assured us that they are indeed giving organisations, such as yours, ample opportunity to see the results of their monitoring and to be involved in the whole issue of environmental impact assessment. Do you consider that the opportunities you have are adequate?

Mr Voronoff—Absolutely not.

Dr Matthews—No, definitely not. It is after the event. They give us a chance to comment after everything is over and done with.

Mr Noonan—There are a number of points that one could make. Over a number of years the monitoring reports—I won't use the correct title at present; the annual monitoring reports—for the Olympic Dam operations of Western Mining, only became public perhaps some three months after the period of the monitoring data had been completed. They were quite expensive documents. They had very limited public availability. You basically had to make arrangements either through the Department of Mines and Energy or through Western Mining to get access to them.

In the last 12 months that situation may have changed slightly, but a more

fundamental matter of aspect of access to environmental monitoring information—in fact, to all information relative to Roxby Downs—is that under the state indenture act information can only be released in regard to the mine if it is by the approval of both the company and the government. It is not on public record as to on what occasions it was requested by either the company or the government that information not be released. It is not on the public record as to on how many occasions information has been withheld because either the company or the government requested that it be withheld. And it is not on public record as to what that information may have been. So, while some documentation is released, and it may have broader public access now than it has had over most of the period of the life of the mine, there is still a broader legal question as to whether that information is complete.

Dr Matthews—I should also add that there was a recent conference in Adelaide called Resources 95 and Richard Yeeles—and Pearce Bowman gave a paper there. I attended it and at the end of it I asked him two questions which he successfully dodged. Although he replied he did not answer the questions. Also, you will probably find some letters to the editor in the *Bulletin*—there was an announcement, a media release from Western Mining and an article in the *Bulletin*. I sent a letter to the editor and I raised several questions. Richard Yeeles replied to my letter but, again, did not answer the questions that were raised.

Senator LEES—If the committee could have access to those letters it would help to fill in some of the gaps.

CHAIR—There are models of community consultation for other mines, like Ranger. Would you like to see a model developed similar to the Ranger community consultation model?

Dr Matthews—No. I am not sure what you are talking about.

Mr Voronoff—I would not say that the Ranger model is entirely adequate either.

Senator LEES—What model would you like to see?

Mr Voronoff—We have reservations about that.

Senator LEES—What would be your ideal?

Mr Voronoff—It would have to be monitored. It would have to be a consultation process that has an independent form of arbitration which would allow for all interested parties to put their views and also assess any data, research, hypotheses, et cetera, that are promulgated by various sources. I think the problem at the moment is that there is a proliferation of data, et cetera, from one source, or very limited sources and they are vested interests. Even the Department of Mines and Energy have specifically stated that

one of their key strategies is to facilitate the expansion of ODO.

It is our view that whilst the data, research, hypotheses et cetera may in fact be scientifically true, they need as a bare minimum to be subjected to fundamental scientific methodology, which is to have them repeated and tested by independent sources. There is a paucity of that process being undertaken. We would see that that is a bare minimum requirement and we think that that role could be adequately fulfilled by broader community consultation and the intervention of a body such as the OSS.

ACTING CHAIR—I must say that, from my point of view, this is the first time I have heard of the acid leach method. I do not read about new uranium mines in that sense all the time; I had not heard about it in Western Australia. What has been the Conservation Council's and the Friends of the Earth Nouveau's view about the acid leaching process and the assurances that were given by proponents that the process is environmentally benign?

Dr Matthews—We do not have any information from the company about the process that they are going to use yet. There is nothing that we can refer to, but it is very similar to a project that we do know something about—the Honeymoon project that was closed down.

The in situ leaching—the ISL process—can be actually acid or alkaline. They vary it depending on the circumstances, and I think he was favouring actually an alkaline leach. I think he talked about a carbonate leach which is an alkaline leach. Irrespective of what sort of solution you use to dissolve the material, the biggest concern is where the water goes. If you are pumping this corrosive leaching solution down into the ground, you had better make sure you get it all up again, especially because it is going to dissolve the nasties. Control over where the water goes is the key thing and in the case of Honeymoon they lost control. There is a fine point between mining, pilot plants and trials and between minor trials and major trials but they essentially tried out their process for the purposes of the pilot plant. I would have said they were doing trials for the pilot plant and they lost control. They got blockage, which they had not anticipated, due to precipitation of a certain mineral. They did not inform the government and now it is a different company. I am not talking about the same company, but these are the sorts of problems that can go wrong. The only way the government found out was through the Campaign Against Nuclear Energy, which happened to come by—I cannot say how—the internal memos about what was going on. They supplied those to the government and then the government shut down that operation.

ACTING CHAIR—What was the time frame?

Dr Matthews—Zonks, ages.

ACTING CHAIR—From the time the community became aware and the time they

were able to shut it down?

Dr Matthews—It was fairly quickly. As soon as we took the information to the minister, he more or less closed them down overnight.

Mr Noonan—I think it is on the record in the Upper House inquiry report that it was two years or slightly more that the company and the mines department people were aware of the leak prior to action.

ACTING CHAIR—And so it was a lengthy pilot plant?

Dr Matthews—They were trying that process out on site, so it was not full production. I do not know if you would call it pilot plant or trials. The words are not important as far as I am concerned. They were trying the process on site and it went wrong. They did not communicate with the government. The problem is not only blockages and losing control over the liquid but preventing the liquid from moving sideways or up and down. Up and down it can contaminate other water layers and, in this case, the Great Artesian Basin in the ultimate scenario.

They are depending on two things. One is the blocking effect of what they refer to as 300 metres of clay. I would be surprised if there were 300 metres of clay over the entire area—that there were not areas where that was not the case. Again, we have no information so we have to take their word for it, I suppose, at this stage. They are relying on that to prevent it going down to the Great Artesian Basin. Plus, they are relying on the fact that they are pumping out faster than they are putting in. So, there will be a tendency for water not to move away, but it depends on porosities. If there is an area of rock that is less porous than another, it will tend to go in the less porous area. If you see that happening then you have got to increase your pumping rate and put down more water to prevent that. So things can go wrong.

ACTING CHAIR—The company indicated that would not really be a problem if there was a minor leak, if I am reading their words correctly, because the water is not potable and it is not used and therefore it is not able to move into other parts of the Artesian Basin.

Dr Matthews—The Great Artesian Basin water is not potable; they are putting it through reverse osmosis process to make it potable. You can do that in principle to any water. Of course, the more saltier the water, the more cost. You can do it but it is more costly. If you have got a big mining operation that desperately needs water, they are going to have to pay to purify the water to their standards. Potentially, any water body, especially in inland Australia, is commercially useful. As you run out of water then you are prepared to pay more for what is left.

ACTING CHAIR—They also indicated that a lot of the Artesian Basin water in

that area was already radioactive so it did not matter if further—

Dr Matthews—Again, radioactivity is a bit like salt. You can get it out if you have to. The same process, reverse osmosis, will take out the radioactive contaminants.

Senator LEES—I would like to have a look at the additional material on the mound springs and what is happening with the water. What do you see as the greatest problem relating particularly to the mine at Roxby? With the Beverley one we have to wait for more information and look closely at what was said today. However, in terms of Roxby you have raised a range of issues. Is there any one issue that stands out more than any other?

Dr Matthews—The two that occur to me immediately are health and safety and the tailings system. It is still not clear to me what they are doing. They talked today about a clay liner on their tailings storage facility. There is a TSF, tailings storage facility, and a TRS, tailings retention system. The tailings retention system is the overall thing and there are various elements within that, one of which is the tailings storage facility. The other is mine water evaporation and wash water evaporation, et cetera. Actually, their literature uses the two terms interchangeably so that is really confusing as to which is which.

Today they talked about clay linings for the tailings storage facility. It was not clear to me whether that is the same old lining they used before. In other words, it was stuff that occurred on site, which is very sandy clay which has been somehow compacted and treated to try and make it impervious, but it obviously is not. They admit themselves that there is seepage down through it. Maybe they have put in a proper clay liner but I doubt it; I have not seen any evidence of that. As far as I know it is still the same pervious sandy clay non-liner that they are using.

ACTING CHAIR—Thank you very much. We really appreciate your patience and we appreciate you coming back to the committee. We appreciate the effort it will take you with your limited resources to be able to respond to the further questions that the committee has put on notice.

Resolved:

That the document from the Conservation Council of South Australia be included in the transcript of today's proceedings.

Subcommittee adjourned at 2.20 p.m.