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TECHNOLOGY AND THE ARTS REFERENCES COMMITTEE

Reference: Environmental regulation of uranium mining

TUESDAY, 1 OCTOBER 2002

JABIRU

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SENATE
ENVIRONMENT, COMMUNICATIONS, INFORMATION TECHNOLOGY
AND THE ARTS REFERENCES COMMITTEE

Tuesday, 1 October 2002

Members: Senator Allison (*Chair*), Senator Tierney (*Deputy Chair*), Senators Lundy, Mackay, Tchen and Wong

Substitute members: Senator Crossin for Senator Mackay, Senator Buckland for Senator Lundy and Senator Scullion for Senator Tierney

Participating members: Senators Abetz, Bolkus, Boswell, Brown, Buckland, George Campbell, Carr, Chapman, Conroy, Coonan, Eggleston, Evans, Faulkner, Ferguson, Ferris, Harradine, Harris, Knowles, Lees, Mason, McGauran, Murphy, Nettle, Payne and Watson

Senators in attendance: Senators Allison, Buckland, Crossin, Nettle, Scullion and Wong

Terms of reference for the inquiry:

The regulatory, monitoring, and reporting regimes that govern environmental performance at the Ranger and Jabiluka uranium operations in the Northern Territory and the Beverley and Honeymoon *in situ* leach operations in South Australia, with particular reference to:

- (a) the adequacy, effectiveness and performance of existing monitoring and reporting regimes and regulations;
- (b) the adequacy and effectiveness of those Commonwealth agencies responsible for the oversight and implementation of these regimes; and
- (c) a review of Commonwealth responsibilities and mechanisms to realise improved environmental performance and transparency of reporting.

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Committee met at 2.54 p.m.

CHAIR—I declare open this public hearing of the Senate Environment, Communications, Information Technology and the Arts References Committee's inquiry into the environmental regulation of uranium mining. I welcome everybody here today.

The committee was asked to undertake this inquiry by the Senate on 20 June 2002, with a reporting deadline of 5 December 2002. Today's hearing is the second in a program of hearings the committee will be undertaking in order to ensure that we complete our report by the 5 December deadline. As everyone is no doubt aware, yesterday we held hearings in Darwin and after today we are travelling to Adelaide for hearings there on Friday. We plan to conduct hearings in Canberra on 18 October and at some stage during the following week, details of which will be announced in a week or so. The committee also intends to visit all four of the mine sites which are the subject of our terms of reference; we visited Jabiluka and Ranger this morning.

[2.55 p.m.]

NORTON, Councillor David Jeffery, Chairman, Jabiru Town Council

THOMSON, Mr Stephen, Acting Council Clerk, Jabiru Town Council

CHAIR—Welcome. The committee has your submission before it, which it has already published. Would you like to make any alterations or additions to that document at this stage?

Councillor Norton—Not to the document itself, no.

CHAIR—The committee prefers all evidence to be given in public but, should you at any stage wish to give your evidence, part of your evidence or answers to specific questions in private, you may ask to do so and the committee will consider your request. Finally—and I will say this only once for the benefit of all of our witnesses—witnesses are reminded that the evidence given to the committee is protected by parliamentary privilege. I have been asked by the Senate Privileges Committee to remind you that the giving of false or misleading evidence to the committee may constitute a contempt of the Senate. I now invite you to make a brief opening statement, after which we will go to questions.

Councillor Norton—Welcome to Jabiru.

CHAIR—Thank you.

Councillor Norton—Jabiru has been my home for 13 years. I have served in the Jabiru Town Council for 10 of those years; this is my third term as chairman. Until August when ERISS decided to move to Darwin, I worked as a technical officer for the Supervising Scientist. Council is the only body elected by every registered voter within the radius of the Jabiru police station. It is not a federal government department, it does not have an affiliation with any political party and it is not an appointed, quasi-autonomous government organisation or technical committee. It is a good, old-fashioned democracy.

Jabiru and the Australian population have prospered from the extraction of uranium from the Ranger mine for 20 years. It provides jobs and good incomes and has made Jabiru the local government area with the highest disposal income. This has come at a cost to the Mirrar people, the traditional owners of this country. Jabiru is a unique community, where most of the bidding population live in tied accommodation. From a local government perspective, council tries to represent this diverse community—with its different opinions on the values of uranium mining—to its best ability. The people include uranium miners, park rangers, hospitality workers, traditional owners, tourism workers, local businesspeople, teachers and Territory and federal public servants, all of whom have a different view on this subject, and not necessarily a stereotypical one.

The common factor is that the job has to be done properly. The microscope has been exchanged for a telescope. Council has expressed concern about the reliability of a remote monitoring service to provide an adequate and effective monitoring program. During a period of

budgetary cost cutting—combined with the burden on the public purse to provide ever-increasing resources for the Australian defence forces and the present drought—some aspects of the program, such as travel allowances, are vulnerable. It costs an estimated \$200 to send one vehicle to Jabiru, plus accommodation, meals and loss of time in travelling. It takes approximately six hours for that journey. Jabiru Town Council raised its concerns when this was proposed through the original consultation process, when its submission was omitted from the final report to the minister.

ERISS is primarily a research institute with a monitoring role that has now split in two. What were the Jabiru headquarters of that institute are now in Darwin, leaving a Jabiru field station with six permanent staff—an administration officer, a field station manager, an Aboriginal liaison officer and three technical staff. All but the administration officer have more than five months experience at the field station and none of those five has experienced a wet season on the job.

From 260 kilometres away, the tyranny of distance factor is a reality. This community's future is decided by people who do not live here, and ERISS has decided to join them. There is a risk that this community and the understanding of this country will become distant. Jabiru is not a field site. It is a unique, vital Territory community of 1,309 people. The ERISS field station is going to need a lot of support from the Darwin office. That will mean a lot of travel in the wet season, when the road is closed annually because of flooding and aircraft and long, overnight stays for field personnel are the only option. It is the expectation of this council that the resources be provided to continue at a high standard the monitoring and reporting of impacts of uranium mining by government to the benefit of all parties involved. This is a particularly sensitive issue for both the Indigenous and the non-Indigenous communities. The Jabiru Town Council is very grateful for the opportunity to contribute to the Senate debate on the environmental regulation of uranium mining. Thank you.

CHAIR—Thank you, Councillor Norton. Can I take it from what you have just said that this is one of the most important issues for you: the removal of personnel to Darwin from Jabiru?

Councillor Norton—It is a very important issue, yes.

CHAIR—Can I invite you then to expand on the implications of it beyond the distant decision making. Are there other impacts in the community you represent?

Councillor Norton—The other impacts are a very large diminishment in the population of the town and the effect on the school and child care and all those sorts of things. Basically, this inquiry is to do with the monitoring of mining and if that is going to be done from a distance there is a problem, as far as we can see, with the pressure of finance. If you have to pay people to come out here or stay any length of time that money has to be found to provide the service that is required. I would like to stick to mainly the main issue, but generally speaking, yes. We were never in favour of ERISS going to Darwin in the first place when it was first mooted about four years ago.

CHAIR—There seems to be a lot of opposition to that move. Why do you think it was taken in the first place?

Councillor Norton—Why do I think it was taken? That is a hard question. Personally, I suppose there is the social thing where it is very hard to find people to do those jobs when they would not want to live in a remote area, so there is a problem employing people, I suppose. I am not really in a privileged position to know the decisions in that sense. The role of ERISS has changed from a research organisation to a monitoring organisation, which I think is a great thing. That is not as exciting as research. I think it is a very important job and it has to be done. Unfortunately, the wheels for moving to Darwin were started well before the monitoring role was highlighted.

CHAIR—Thank you.

Senator CROSSIN—Did you say you had worked for ERISS?

Councillor Norton—Yes, I worked for ERISS for 13 years.

Senator CROSSIN—And you are still at ERISS?

Councillor Norton —No, I got made redundant. I decided not to go Darwin. There was no bitterness there. I am quite happy to stay in Jabiru.

Senator CROSSIN—Okay. What is your feeling, then, about the timing of this decision? As Senator Allison said, we have gone through a campaign already where I think ERISS were going to move to the Northern Territory University some three or four years back. I suppose it came as an announcement through part of the Commonwealth's budget this year. Was the town council given any warning that that might have been the case?

Councillor Norton—There was a consultation process—I think it was in 1998—when the economics were discussed of moving to Darwin. The council put a response in which was not positive towards that decision. We could not see how they could actually make any savings because the housing in Jabiru is on a short lease of 20 years and you could not really realise those assets. I would say from the community's perspective it seems a long way. If you are going to monitor something you should be here rather than 260 kilometres away.

Senator CROSSIN—From your personal experience at ERISS, do you believe their ability to be able to undertake monitoring activities will be diminished if they are not on site?

Councillor Norton—I would say the skills of the organisation are first rate but the factor is man-hours. If you accentuate those man-hours by travelling that will impact on it. On the current staffing levels, I think the field station needs more people because you need to have two people to go out in the field and there are only three technical officers and then you start going into the administration staff. If something happens like a fish kill, when it is very short notice, you have to get people out very fast. Unless you have people here waiting in anticipation of something happening, I am not sure how they are going to do that without being under a fair bit of pressure.

Senator CROSSIN—OSS gave us evidence yesterday that for the first time in 20 years they have somebody here now, somebody in fact who is charge of their field station, which is one

person. Do you believe that that will compensate for the lack of staff from ERISS being on the ground?

Councillor Norton—I do not know much about that. I do not think it is the person. Generally speaking, from an employee, it is a very high-pressure job and there is a lot required of it. I do not really wish to go into the skills of the person doing that job. I do not really know.

Senator CROSSIN—No, I guess what I am saying is if ERISS have now got three technical staff on site and OSS for the first time are saying they have somebody here on site, do you believe that that additional person will compensate in some way for the ERISS staff being downsized?

Councillor Norton—When you had about 40 people there, I do not see how that can compensate. You have six, and you used to have a complement of 35 to 40. In its heyday it was 50 to 60, and you always had somebody there who could go out in the field with you. They do not necessarily have to be collecting samples. They can be that safety person with you in the field. When you are down to a small staff, those questions come into play.

Senator CROSSIN—Does the town council have any other comments or observations that it wants to make about the environmental monitoring of the mine?

Councillor Norton—We have been satisfied with the job so far. There has never been any great issue in that sense. But the fact is that the people who elect us and who we represent have got concerns, and they stretch from the traditional owners onwards. The traditional owners mainly have concerns about the quality of the monitoring, and we would like to reflect that.

Senator CROSSIN—Thank you.

Senator SCULLION—What sort of impact does the Ranger mine have on the town? Does it impact on everything?

Councillor Norton—We would not be here.

Senator SCULLION—Perhaps you can go from that angle. What are the other options for the town at the moment?

Councillor Norton—The other option for the town is obviously the tourism factor, but for most northern Australian towns that is usually a seasonal thing. The town was designed for approximately 3,000 people and there is now a population of 1,300. It was around 2,000 recently. That is the official ABN figure. At the moment, because of the complications in the way this town is owned by the director of Parks and Wildlife and the headlease agreement with a limitation of 20 years, investment in this town is very hard to procure. If you actually look around the town plaza, you will see how old it is. People are not putting money into modernising this place. The council is basically not putting money or resources into long-term projects until it has a resolution of the future of this town with the headlease. That can only be achieved with a satisfactory agreement with the Mirrar people, and council is very aware of that and very pleased to go into negotiations with Mirrar.

CHAIR—It seems that we have covered most of the issues, unless you want to add something.

Councillor Norton—No, thank you.

CHAIR—Thank you very much for appearing before us today.

Councillor Norton—Thank you.

[3.09 p.m.]

MUDD, Dr Gavin Mark, Environment Consultant, Gundjehmi Aboriginal Corporation

O'BRIEN, Mr Justin Jon Quentin, Communications and Policy Officer, Gundjehmi Aboriginal Corporation

RALPH, Mr Andrew Peter, Executive Officer, Gundjehmi Aboriginal Corporation

CHAIR—Welcome. The committee has your submission before it, and we have already published that document. Are there any changes or additions you wish to make to that document at this stage?

Mr Ralph—No.

CHAIR—The committee prefers all evidence to be given in public, but should you at any stage wish to give your evidence, part of your evidence or answers to specific questions in private, you may ask to do so and we will consider your request. I now invite you to make a brief opening statement, after which we will go to questions.

Mr Ralph—Thank you. Firstly, I want to acknowledge the traditional owners of this country—and indeed our employers—the courageous Mirrar people. With me today to give oral evidence is Justin O'Brien, who is charged with policy and communications at Gundjehmi, and one of our consultants, Dr Gavin Mudd, who is an environmental engineer. Gavin has a PhD in the environmental impact and management of mine wastes.

The willingness of the Mirrar community to engage in this current process to positively contribute to improved environmental regulation of the Ranger mine and the proposed Jabiluka mine in no way disqualifies Mirrar opposition to the further uranium mining on their traditional country. The Mirrar still say no to Jabiluka. This development threatens the cultural integrity of the sacred sites and poses environmental impacts unacceptable to the traditional owners.

We believe that much of yesterday's evidence strayed very far indeed from this inquiry's terms of reference. This inquiry is not about environmental impact. It is not about the fourth quarter, as Bob Cleary has said. It is not about the no impact mantra of the OSS and DBIRD. It is not about whether or not there is evidence of impact, as Senator Scullion has said. This inquiry is about the adequacy, effectiveness and performance of the monitoring and reporting regimes and the regulations in place. We submit that these regimes and regulations are inadequate in themselves without reference to any environmental impact. They are inadequate because they are governed by ad hoc agreements between the Commonwealth and the Northern Territory governments and are essentially reactive to the development agenda and exclude the considerations of the traditional owners.

The current system is inconsistent, lacking in accountability and outdated. Agreements under land rights acts do not operate effectively and are not supported by legislation. While, strictly speaking, outside the terms of reference of this inquiry, social impact monitoring, crucial to the

maintenance of the World Heritage values of Kakadu, is almost non-existent. Although required for reporting under the Ranger environmental requirements, there is no ongoing social impact monitoring and minimal willingness to separate it from the development agenda. Thus the inclusion of a single clause for social impact monitoring in the environmental regulations is considered with the cynicism it deserves.

In our submission we introduce an outline of a proposal for a new Commonwealth act to reform the regulation of uranium mining in the Alligator Rivers regions of the Northern Territory. The regime for regulation of uranium mining at Ranger and Jabiluka is overly complex, confusing, inconsistent and incomplete. Moreover it does not provide for traditional owners to effectively participate in management of Aboriginal land subject to mining interests via the land rights agreements. Gundjehmi contend that such an ad hoc system of regulation would be deemed unacceptable in most other areas of public administration.

The Gundjehmi Aboriginal Corporation can see little long-term benefit in proposing recommendations that attempt to fix the current system. For example, it is highly questionable whether the long overdue implementation of the various agreements between the Commonwealth and the NT would bring any benefit, given that such instruments are wholly inappropriate for the proper regulation of uranium mining on Aboriginal land. Instead, Gundjehmi propose that the Commonwealth parliament urgently develop and implement an all-encompassing act to reform the regulation of uranium mining in the Alligator Rivers region of the Northern Territory.

The submission details Mirrar concerns from a Western scientific perspective and the inaccuracies of the present environmental monitoring and reporting regimes at Ranger and Jabiluka mines. The nature and extent of these regimes are critically examined and suggestions provided as to how they may be improved. The Mirrar consider that such improvements are necessary under any environmental regulatory regime, whether or not the legislative overhaul suggested in our submission is indeed adopted.

The major issues detailed in the submission include water management, irrigation, tailings management, waste rock dumps, ground water impacts and surface water quality impacts and regulatory limits. All of these have potentially significant impact on the timing, difficulty and quality of rehab and Mirrar aspirations for post-mining land use. The major problem in assessing the efficacy of the regulatory regimes is that most of the statutory reports required for Ranger and Jabiluka are commercial-in-confidence and not public. These reports must be publicly available.

The Mirrar support more frequent as well as event based monitoring and wish to see it implemented to ensure accurate measurements of contaminant loads. There are concerns about the extent and accuracy of the biological monitoring program. In order to constrain the expanding footprint of and water quality impacts from Ranger and Jabiluka, the Mirrar wish to see several compliance points established around the project sites to ensure that contaminants are retained on the mine site. The water quality limits also need to be improved to reflect Mirrar expectations that no change in downstream water quality will be achieved in Kakadu.

In order to provide for greater transparency as rehab and close-out is planned, more detailed and rigorous research is required to address existing knowledge gaps. Key areas include long-

term cumulative loads of contaminants in ecosystems, ground water transports of contaminants, landform design and final land use. The Mirrar take very seriously their cultural obligations to their people and their country. For over 20 years, they have experienced the social and environmental impacts of uranium mining. They are the legal landowners of the lease areas and do not differentiate between their responsibilities for looking after country in the lease area and the surrounding Kakadu National Park.

The Mirrar see the government authority to mine as a licence for ERA to use the Ranger and Jabiluka leases as a dumping ground for contaminants. They are concerned whenever there is a leak, an unplanned event or an incident that contributes to the ever increasing area of impact. They are outraged when the government regulator prepares flimsy defences on behalf of the mining company or interprets the environmental regulations in its favour. They have done this almost without exception in 110 incidents over the last 21 years. The mining company has never been prosecuted or penalised by regulators in that time. Both the company and the authorities have presented evidence to this inquiry that they are more concerned with media reporting than with providing thorough and independent regulation and seriously addressing Mirrar concerns for protecting their country. The Mirrar expect that the environmental regulation of uranium mining should enforce comprehensive and systematic monitoring of operations to demonstrate that short- to long-term cumulative effects and impacts on Mirrar country are the least possible, and that mining companies are held accountable to all stakeholders for their actions.

When the company and the governments have long forgotten about Ranger in the centuries to come, the Mirrar will be unfairly burdened with a monument made of radioactive waste rock that was the former mine site. I stress again that this inquiry is not about environmental impacts but the processes and agreements that constitute the overall regulatory regimes. To stray momentarily from the terms of reference, we contend that there is an environmental impact from Ranger and Jabiluka. Government regulations currently allow up to 580 times the background level of uranium to flow freely through the waterways of Kakadu National Park, downstream from the Jabiluka site. For Ranger, uranium is allowed to increase by about 58 times the background. The Mirrar contend that any change to water quality in the World Heritage area is completely unacceptable. There are acknowledged higher than background concentrations of magnesium sulfate in the Magela as a result of Ranger. Geoffrey Kyle's allegations, and the OSS report into them, provide evidence of high levels of uranium inside Kakadu—levels of seven parts per billion and 11 parts per billion that would have had the mine shut down if they had been recorded in the Ranger project area.

We also believe there is an impact because the traditional owners say there is. Their concerns fall within the gamut of the environmental regulations: 16.1(c) states that if they are concerned then impact exists. Regarding the traditional owners, we want the committee and the Australian public to understand that they are not merely stakeholders; they are landowners. They have been the custodians of this ancient culture that has managed its people and country for thousands of years. Indeed, one of the oldest dated continuous occupation sites in Australia is on the Jabiluka lease, little more than one kilometre from the mine operations. We hope that the deliberations of this inquiry will give the landowners confidence in the continuation of one of the world's oldest cultures and traditions.

Senator SCULLION—Thank you, Mr Ralph. That was most informative. I have to confess I have not managed to put my mind to most of the technical data in the submission but, even after

the most brief perusal, it is the most comprehensive of the submissions we have received. You mentioned Mr Geoffrey Kyle. I recall—I think it was on the 26th, on the Triple J news—a comment that was attributed to the Gundjehmi Corporation to the effect that the investigation conducted by the Northern Territory government and the Office of the Supervising Scientist into those allegations found that in fact there was no case to answer. You have basically said that that was a whitewash. Could you share with me your reasons for thinking that and perhaps any evidence you have to suggest that that may be the case.

Mr Ralph—For starters, the OSS did not deny that there were levels of 7.4 parts per billion found inside Kakadu National Park by Geoffrey Kyle. The OSS also acknowledged that the mining company changed that database at some point later on, after it was entered by Geoffrey Kyle. They changed it without doing any reanalysis of that sample. How they arrived at 0.1 is beyond me.

Senator SCULLION—We heard in the evidence yesterday that it was not known who had altered the sample. I accept that. Is there anything else generally saying it was a whitewash? It is a general use of the term ‘whitewash’ when you say people are complicit in ensuring an investigation does not go the way it goes. If that was your intent, I thought you may have an opportunity to give some evidence to that effect.

Dr Mudd—It must be remembered that the report was only provided one working day before the hearing, so that is a definite and legitimate concern. In reviewing the report last night, one point is to look at the concentrations that are leeching off the tailings dam south wall. If there was non-mineralised material placed on that dam wall, and yet there were concentrations of a few thousand parts per billion leaking off that wall, and it is non-mineralised material that is the source of that—rainwater hitting that material on the outside of the dam wall and then running off into Gulungul Creek—that is a legitimate concern. There are unquantified loads going into that system and that has been detected in Kakadu National Park. That fact that it was non-mineralised material that was causing this concentration and the loads of uranium is a real issue and it is something that is completely ignored by the OSS. They talk in general arguments about those issues. I do not think there was a thorough scientific analysis of all those issues; I do not think it went far enough.

Mr O’Brien—The report is quite certain in its outcome. However, it mentions that it is an inconclusive report; that there are obvious inconsistencies and incorrect analyses that have taken place at the Ranger mine. So we are not confident, on that basis of inconclusive evidence, that the Supervising Scientist can be so confident.

Senator SCULLION—And I think they alluded to the time factor involved and that that was part of the reason.

Mr Ralph—The issue of concern for the Mirrar is that no-one disputes that there were levels of 7 and 11 parts per billion found in Gulungul Creek at a popular swimming spot for the Mirrar people, and indeed tourists have been swimming there. It is in Kakadu National Park. If those levels had been recorded on the project area—the limit back in those days was 3.8—the mine would have been closed.

Senator SCULLION—In terms of information, your submission indicates that you have vast access to a whole range of data and material, not only from Dr Mudd's involvement. You mentioned in your opening statement that you need to ensure that public reports and activities are made publicly available. Do you get much access to the reports available from ERA and the miners?

Dr Mudd—Most of the reports that are required under the statutory authorisation—the Northern Territory general authorisation—are not public. We have requested them through the Northern Land Council and we have not got them. We talk to the company and we are getting access to some other reports. There are still a lot of reports that we know of. It was suggested yesterday that most of the OSS reports are indeed public. I know of several which, when I have requested them in the past, have not been provided. I know that there are a lot more than one or two. I would suggest it would be several dozen that are not public with their internal reports. Because of this Senate inquiry, we may be able to establish a greater principle of transparency and openness. This is a World Heritage area and there are legitimate reasons to have full transparency on these issues.

Senator SCULLION—I understand we have some 200. How many have we got, Madam Chair, that we have asked to be made public or supplied to the committee? One would hope that some of those that have been omitted are amongst those. In a general sense, if you need some information outside of these particular ones, does the company give you access to a lot of that information in terms of the structural stuff that happens in all these reports?

Mr O'Brien—There are certain reports, such as the stockpiling manual at Ranger, that would be very handy for us to determine whether they are sticking to their manual, which is commercial-in-confidence. The Mining Management Act in the Northern Territory demands that a manual be prepared for that act. Many of those have been made public by mining companies. We would hope that ERA would make theirs public. It is often on a needs basis, in the sense that we will want something, if we know it exists. Sometimes we will inadvertently discover the existence of documents. A case in point would be soils studies at Jabiluka. We did not think they existed, but there were some reports in 1996 talking about the impact.

Senator SCULLION—How did you inadvertently discover those?

Dr Mudd—We discovered those through ERA's application for irrigation this year. It made reference to studies on disposal of contaminated water back in 1996. So, before the draft EIS, they were already planning these sorts of studies. It raises a number of legitimate issues that we would want to assess. We requested those reports and we have actually received those.

Senator SCULLION—When you have made the request for those sorts of things that they refer to in public documents, you have not had any problem getting those?

Dr Mudd—This application was not a public document. It was only done through the mine site technical committee.

Senator SCULLION—When you said, 'Listen, I'd like to have discovery of those things,' they gave you access?

Dr Mudd—For these specific documents, when we found out they existed and requested them, we were given them, yes. Often it is a matter of finding out what does exist in the first place.

Senator SCULLION—In terms of trying to find out what happens in the environment and what happens when they are checking the mine site, we have spoken a lot today, and certainly yesterday, about triggers. We seem to use the water quality triggers as indicators. It has taken me a day to get around the vernacular. We understand that at the moment the safe standard for drinking water is 20 parts a billion. The current limit is set at 5.8—call it six—and you are not allowed to go any higher than that. I understand, according to page 5E of your submission, you want to recommend that at Jabiluka the limit be reduced to 0.05 parts per billion. You seem to reflect legitimate concerns. That is one four-hundredth of the level of drinking water. As a layperson in these sorts of things, I would have thought that was really extreme: on an almost daily basis, tiny fluctuations would put the mine in breach. Even from an assay position, as you explained to me today, there could be other fluctuations in that. How can you say that such a tiny level as a trigger would be legitimate?

Dr Mudd—When we were at the Ranger mine site this morning, what we were talking about were levels of 0.01 and 0.02; 0.05 is getting to the point where you can have a greater confidence in the ability to chemically measure with reliability. The reason we have that perspective is that we do not want to see any change in Kakadu. The monitoring point downstream of Jabiluka is actually inside Kakadu National Park. One of our other recommendations is to actually move the primary compliance point from there to the edge of the Jabiluka project area, the currently disturbed area. We would have one compliance point on north tributary and then a second compliance point at central tributary. The reason why we say 0.05 rather than 5.8 is that we do not want to see impacts. Traditional owners do not want to see any change. They are concerned that the uranium would be getting off-site and therefore allowed to go up to such a high level. That is basically the position they are coming from: they do not want to see any change.

Senator SCULLION—Notwithstanding Mr Ralph's comment—and I think I understand that: that if the traditional owners say there is a change then there is—but with respect to that, what issues have they been exposed to that would give them concern that there is currently uranium escaping from these systems and somehow polluting their waters? What instances can you point to or what information have they been given that would allow them to think that?

Dr Mudd—One of the things that we raised concerns about last year—and we have detailed it quite thoroughly in our submission—is this change from Jabiluka being a clearly articulated, well-approved, no-release water management system to one where, within two to three years of it being operated, they had to start treating the water. After treating the water—they used reverse osmosis and that then failed—late last year they started using direct irrigation of pond water, mixing it with a small amount of output that they were still able to generate from the reverse osmosis unit. We visited the site in November last year. I inspected the soils. I considered the different scientific processes that could be used to retain the uranium on that soil. I did not think there was sufficient capacity in those soils to retain the uranium. I do not think irrigation was appropriate for the site at Jabiluka.

We raised those concerns in November. When we were presented in March with evidence of potential impacts at Jabiluka, the data proved that there were elevated levels of uranium in that tributary—significantly higher levels, up to 1.5 parts per billion in a system that is almost always at 0.01 or lower. If you look at all of the data—the OSS, the ERA and the DBIRD data—the tributaries in Swift Creek have a good average of around 0.01 parts per billion. You might get slightly higher at first flush effects or something like that, but effectively 0.01 is a good standard. It went from 0.01 up to one or higher. The averages for this wet season, according to the OSS data and their interpretation, show that the tributaries have been affected by irrigation. Those concerns are there: there is escaping of those contaminants. We can have a debate about whether or not that is really detectable at the downstream monitoring point but, at the end of the day, Mirrar were told that it was a no release system: that contaminants would be contained. Now, four years later, on a site that is under care and maintenance, we have a system where there has already been escape of contaminants, and they have contaminated a tributary.

Senator SCULLION—When we talk about contaminants and contaminated, a lot of people would think that there is some sort of damage. Isn't it a fact that 10 years ago we would have had difficulty even measuring the amounts that we are talking about? They are minuscule amounts that have no impact on anything at that level; is that right? I would like to get an understanding that that is the case.

Dr Mudd—One of the concerns that Mirrar have is the containment of those particular contaminants. They are concerned that loads are changing and increasing on the system. That is one of the reasons we have argued for event based monitoring. A case in point is Jabiluka last year. On 31 December, there was 150 or 160 millimetres of rainfall at Jabiluka. There was no sample taken for two days. If it had been proven later on in the wet season that all the other data for north tributary was so elevated, it would have been very interesting to have had a chemical analysis of the first sample. They are concerned about the loads leaving that system and the fact that they were told that contaminants would be contained, and they are not.

Senator SCULLION—You obviously have a very close relationship and you speak about this more than anybody with the Mirrar people. Apart from the general concerns that they have with regard to monitoring the agreement of zero—if that is the understanding—and if there is still this detectable level coming out of these places, is there any other evidence, even anecdotal, that it has some impact? They might have seen some things dying or some things changing over time. They obviously have the best and biggest corporate history in the area and would notice if there was any change.

Mr O'Brien—It is important to acknowledge that in the environmental requirements—at least at Ranger, and they are meant to apply in an ad hoc understanding at Jabiluka—the concerns of traditional owners are regarded as an impact. We are not here to talk about environmental impacts—they are outside the terms of reference of the inquiry and we would get on some crazy tangent—but you should know that the social impact of worry is very well documented. It goes back to the Fox inquiry in the seventies and the 1984 social impact studies. There is a perception, and sometimes it is difficult for European people to understand, that Aboriginal people believe certain unconformities, fissures, rock formations and creek systems should not be touched for cultural reasons.

Senator SCULLION—While I recognise that, is that what underpins much of the concern? I imagine that it is very hard to differentiate, but is much of their concern not specifically about uranium pollution but about mining in general?

Mr O'Brien—That is a primary concern. There are also concerns about the long-term loads that they hear of: little by little there is a loading in the system, not just of uranium but of magnesium and magnesium sulfate around the Ranger mine.

Senator SCULLION—This question is not in response to the view of the Mirrar people. Dr Mudd, Using our technology we can now detect levels of uranium, magnesium and other elements in the water that would have been contributing to the flood plain and would have been part of the environment before the mines were here; is that right?

Dr Mudd—Certainly if you look at the Ranger catchment, geologically the ore bodies were very large and very close to the surface. When they discovered the Ranger deposits in 1969, there were very high concentrations of uranium in the soil. If you look at the average concentrations in the Magela Creek and in a lot of the waterways up in the Top End, as a general rule tropical soils are well leached. Generally there are not many nutrients and things like that.

If you look at Jabiluka, for example, because of the geology there you generally have escarpment soils. The actual project site has soils with a concentration of uranium in the order of magnitude lower than the average concentration in the crust. Most of the Alligator Rivers region is like that. You might get small geological areas where that is different but, as a general rule, there might be small concentrations and generally they are low. If you compare them with other concentrations around the world, generally they are low. They are not that elevated at all, despite the fact that you do have these uranium bodies. That is basically because of the tropical systems leaching, and the fact that you do not have much residual capacity left in the soils there.

Senator SCULLION—Outside of the alleged spike samples that were found by Mr Kyle, has there been any other testing done on the flood plains? Do we now have the limits technologically to see where there is any discernible change in areas away? Do we have that capacity?

Mr O'Brien—I do not think we do. According to the OSS, the NLC and DBIRD we do not. When we ask them: 'Can you demonstrate to us that there will be no long-term effect from the activities of the Ranger mine?'—and long term we are talking hundreds and hundreds of years—they cannot answer that question. I do not know whether any scientist could. I should also say that a case in point might be that the elevated levels at Corridor Creek this year are 14,000 parts per billion. They were reduced in the Corridor Creek system to 10 or 12 at the monitoring point at the end of that system.

The question for the traditional owners, and this concern is shared by the Northern Land Council, is: what is the ultimate fate of this some 13,000 parts per billion uranium? We are told that it is bound to the first five centimetres of soil as it has been in the Magela land application that has been happening with spray irrigating contaminated water for 16 or so years. We are concerned that this system has been saturated and that the rehabilitation implications for this country have not been adequately considered. This is country that will have to be returned one

day to Kakadu and that, ostensibly, the Mirrar will one day visit again. It is not just a matter of this fourth quarter that Bob Cleary mentioned yesterday being five kilometres downstream at the 009 site. The RPA itself is not a place to be trashed.

Senator SCULLION—We were actually at the spot where this 13k went missing. I understand that 97 per cent is actually taken up or absorbed by the wetland system. It does not go anywhere; it is still sitting in that wetland system. As I understand from evidence yesterday, there seems to be a high level of confidence that, within the series of wetland systems, some 97 per cent was supposed to be taken out in that system. In any event, from the evidence yesterday, the intention is, as part of the rehabilitation process, to dry that, to move that and to take that into the pit. They were asked several times about the technical difficulties that this would have, and they said that they were very confident. Do you have a different view?

Mr O'Brien—Very quickly, I would like to say that we would like to see the report that the information is based on. That 97 per cent is news to us.

Senator SCULLION—That was given in evidence yesterday.

Mr O'Brien—The 97 per cent take-up?

Senator SCULLION—No, I am sorry. The 97 per cent was a statement given to me by Chris, the environmental person out at ERA this morning, in an explanation about the sorts of levels the artificial wetlands they have created take out of the system in the first tranche.

Mr O'Brien—It would be good to see those studies. The second part of your question—

Dr Mudd—We have a concern for the long term, and when we say long term, the Mirrar have been here for many generations and plan to be here for many generations in the future. There was an experiment in 1998 and it was portrayed as an experiment with what I call the RP2 wetland filter. They call it the RP1 wetland filter, and it treats RP2 water, so it is more correct to call it the RP2 wetland filter.

By mid-1998, it had treated about three years worth of RP2 water. They let it dry out, and apparently it was portrayed as an experiment to see what would happen with a wetland filter. All that really happened was that the mill wanted the water, and they forced it to dry out. All the environmental staff at ERA did not want that filter to dry out because they knew that, when it dried out, the first rains would dissolve all the uranium. And what happened? Yes, it dissolved the uranium. They got up to 6,000 parts per billion, I believe. I cannot remember the exact figure off the top of my head.

Senator SCULLION—That was inside—

Dr Mudd—This was in the wetland itself, in the wetland filter. The stuff that was stored temporarily in the soils and in the plants in the wetland filter was then released. Apparently, by the time there was enough rain and, because of the way that particular wetland filter was designed, the water came out the other side. There had been enough rainfall and enough residence time in that system to allow some of the material to go back in again.

That might have been one event, but if you start extrapolating that over many generations and many cycles in the future—we have been told that there will not be any source of contamination: stockpiles, retention ponds and old tailings will not leak, and yet there are examples where they do—then you will understand why the Mirrar do have a lot of concerns about things like that. Those concerns are not adequately factored into the way we are actually addressing rehab at the moment.

Senator SCULLION—I think these wetland system filters are an absolutely marvellous thing; I really do. That is the impression I have from the information that I have read and from what I have seen. Could you give me an example of some other way to deal with these issues; something that is done better somewhere else?

Dr Mudd—One of the things that they tried at Jabiluka was a reverse osmosis unit. At Ranger this morning we saw that the tailings dam had quite a lot of water in it. That is process water; that is the most contaminated water on site. The volume of contaminated water is making it difficult to plan for rehab. To get rid of that water they have built a pilot water treatment system at that site. Traditional owners get blamed. The mining sites say, ‘You would not allow us to release. Therefore we have had to irrigate and therefore we have to use wetlands.’ I think that is actually quite arrogant. Traditional owners did not ask for the miners to come along.

Water treatment should have been put in in the eighties when they started irrigating, rather than waiting until now. Water treatment systems can remove uranium if they are funded properly and if they are technically designed properly. That sort of technology has been around for quite some time. There is reverse osmosis, chemical treatment and biological treatment. Things like that mimic some of the processes that you might see inside a wetland and use them in an industrial process where you have greater control without as many of the long-term environmental risks.

Senator SCULLION—I understood, from a discussion I had with witnesses from the Environment Centre of the Northern Territory during the hearing yesterday, that the original agreement—irrespective of whether that makes any difference in terms of the process—was that there were to be releases. The upside was that the mine decided to keep it all on-site; the downside of that is that we need to use biological filters. As you say, there may be better processes and it is good to hear that they are continuing to look at them.

The input by the Mirrar people into regulatory arrangements is something which you deal with fairly extensively in your submission. In the last paragraph on page 27 of your submission you say:

As in relation to the Ranger Mine, the Traditional Owners have no direct role in the regulatory system at Jabiluka.

You follow this up on page 29 by saying:

Simply put, the regulatory arrangements for operations at Ranger and Jabiluka are inadequate and inappropriate because they prevent the Traditional Owners effectively managing those parts of Mirrar land subject to uranium mining interests.

Does that mean you think that, if there is a mine on Aboriginal land, the traditional owners should be the regulators or should play a larger part in regulation? Could you expand on that point?

Mr O'Brien—We believe traditional owners should have the direct means by which they can instigate the investigation of incidents, should have a role in the sanction process and should have a direct role in altering the regulatory regime. Our model—I should say that it is not really our job to do it either, and we are not very prescriptive; we do not draft any legislation and we are open to any improvements and suggestions—is a beginning.

Mr Ralph—At the moment the Northern Land Council represents the traditional owners on mine sites, the technical committees and the like. They are the legal representatives of the Mirrar. But the land council reps have no special powers as stakeholders.

Mr O'Brien—There is also the point that agreements struck under the Aboriginal Land Rights (Northern Territory) Act are largely excluded. That might be difficult for some to understand. For example, at Jabiluka you have a 1982 agreement under section 43 of the act but you also have a series of letters from Minister Parer to Minister Hill and to the Northern Territory minister in 1997-98: the so-called Jabiluka requirements. These are non-legislative and in no way incorporate any provisions of the Aboriginal land rights act. So they exclude not only traditional owners but also their representatives, the NLC.

Senator SCULLION—So that I get it straight, in terms of regulatory process you think that the traditional owners should have a regulatory role to play in the censoring, the actual regulation and the investigation parts of regulation?

Mr O'Brien—Yes.

Senator SCULLION—Do you think that should be just for uranium mining or for all mining?

Mr O'Brien—It is not for us to say.

Senator SCULLION—Do you hold that view because of particular concerns about this issue?

Mr O'Brien—They could be mining tin; it does not matter.

Mr Ralph—It is a land management issue for traditional owners all over Australia.

Senator SCULLION—Do you think that should be expanded to any mine in Australia: Aboriginal people who own the land should have a much greater say in the regulation of that?

Mr O'Brien—We are not saying that, no.

Dr Mudd—It should really be up to the traditional owners of that area to say. We are representing the Mirrar people here.

Senator SCULLION—In your submission you speak on two areas in relation to the Mirrar people and their participation: one on the social aspects of the investigation but first of all on the

Aboriginal participation committees. I will quote again from page 33 of your submission, where you say:

While the Ranger and Jabiluka *Land Rights Act* Agreements provide for Aboriginal participation committees, these entities are chronically dysfunctional.

Can you tell me why these meetings are dysfunctional?

Mr Ralph—There have been two major committees formed out of the Ranger agreement and the 1982 agreement. There has been the Binning Working Committee for the Jabiluka agreement and there was another committee set up on Ranger. In all these committees the traditional owners are always in a minority and their views end up being marginalised. There is a proportion of other Aboriginal people, the mining company and government representatives with their own views, which usually are not running concurrently with the traditional owners. So there has been a problem for 20 years with getting Mirrar people to participate fully on these committees because their views have not been either heard or acted on.

Senator SCULLION—Do you think that these committees should change? It is not so much the fact that they are meeting and dealing with these issues, but should the representation on them change? Have you any views on what other stakeholders should be included, or the whether the current ones should be excluded? How would you weight that?

Mr Ralph—If you have a strong pro-development portion of your committee and you also have the traditional owners whose views are the exact opposite then it is going to be very hard to get agreement on a whole range of issues.

Senator SCULLION—We heard yesterday about the social impact monitoring committee. Can you tell me what you know about the activities of the social impact monitoring committee?

Mr Ralph—I was interested to hear that there was something to do with alcohol at the moment, but I do not know anything about that. I think the mining company outlined that there is \$600,000 held in trust by the NLC to progress social monitoring. Unfortunately, that is Jabiluka mine money and the Mirrar want nothing to do with it. It is common knowledge that there are millions of dollars in royalties held by the NLC on trust. Mirrar do not want to touch that money. They will never touch that money because it has to do with the Jabiluka mine.

It is seen as a pro-development agenda. That has been the problem with uranium mining in Kakadu, and the mining company and the government trying to conjure support from Aboriginal people. There have been a whole range of studies, the last one of which was the KRSIS study in 1997. The Mirrar seem to be in a minority, even though they are the largest clan in Kakadu by some number—there are about 12 clans and Mirrar are by far the largest. You have the situation where the Mirrar, who are the traditional owners of the Ranger and Jabiluka mine sites, have the view that there should be no development, especially at Jabiluka, mainly because of the sacred site issues. But governments and mining companies have a long history of bringing in other people from different areas who can hold up their hands as strong supporters. So that does create problems when you try to run committees and the like.

Senator SCULLION—So ERA stumped this money up as part of the agreement with the government, and the Mirrar people are saying that you cannot differentiate where the money is coming from: ‘If it comes from ERA, it is to our benefit but we cannot accept it because it may be tainted by Jabiluka.’ Is that pretty much it?

Mr Ralph—That is pretty much it.

Mr O’Brien—Perhaps I should clarify that. It arises from so-called JAM moneys—Jabiluka Agreement moneys. The traditional owners are in receipt of Ranger royalties at the present time, and they have been—their organisation has been—since 1995.

Senator SCULLION—So the money that they particularly have a problem with is actually identified as coming from—

Mr Ralph—Jabiluka agreement moneys.

Mr O’Brien—That social impact monitoring money is currently held on trust by the NLC. It is under the 1998 deed poll.

Senator SCULLION—I suppose this is a supplementary question to my previous one. You talk about social monitoring or the lack of it. If you think this committee is not working, can you suggest some other ways it could? You have an organisation yourselves. Could you make some submissions at some stage?

Mr O’Brien—Absolutely.

Senator SCULLION—Could you glean what some of the impacts are and what some other mechanisms are without saying, ‘This money isn’t there, we can’t do that.’ There must be some other mechanisms we could use.

Mr O’Brien—It is just sitting there, and it is quite a sizeable amount. Our suggestion would be to backfill the Jabiluka decline, to completely rehabilitate that site and to incorporate it into Kakadu National Park. That money would then be pretty much laundered.

Senator SCULLION—But do you think that would have the social benefits? Do you think people would not worry then? Do you think that would ameliorate a lot of the challenges you have identified about the social impact?

Mr O’Brien—The royalty-receiving entity for that money is the Djabulukgu Association. It is an annexe to the 1982 agreement. It has, at the request of a third of its membership—the Mirrar—not called on the NLC to release that money. That is on the basis that they do not want that money touched because it will destroy their sacred site.

Senator SCULLION—I understand that. I was going more to the issue that a social impact committee or meeting is basically to try to get a better understanding of what the social impacts are. Could you suggest another process outside of this ERA or Jabiluka money that would identify very importantly what these issues are?

Mr Ralph—Most certainly. Indeed, we are going through the section 44 agreement at the moment and looking at social impact monitoring. I think the Mirrar could play a central role in future social impact monitoring in Kakadu.

Mr O'Brien—That is the renegotiation of the Ranger mining agreement—the so-called section 44 renegotiation.

Mr Ralph—The land rights act.

Senator CROSSIN—Following from that, are the Mirrar people involved in the work arising from the social impact study of the KRSIS committee that was headed up by Bob Collins?

Mr Ralph—They were. It was based on Kakadu, and there were a whole number of clans involved. I believe there were some problems with appointments of staff to run the study. As you know, it was funded by the Commonwealth and Northern Territory governments and the mining company, and I think the land council put in some money as well. That report goes back five years to June 1997, and very little has come out of it. It has stopped in its tracks. There have been no meetings about the KRSIS outcomes for quite some time.

Senator CROSSIN—Can I ask you about the new Northern Territory government Mining Management Act. Will traditional owners or Mirrar people through the NLC have any input to or get to look at the mine management plan that will be required?

Mr O'Brien—Not to my knowledge.

Dr Mudd—Once it has been released and approved by DBIRD as the new statutory mine plan, it is believed that it will be made public. There is no requirement, I understand, in that act to force it to be made public. That is basically the decision of the company and the regulator. We understand—and from Tony McGill's evidence yesterday—that it will eventually be made public but only after it has been signed off. There was no Mirrar input into it.

Senator CROSSIN—So there was no consultation prior to it being finished?

Dr Mudd—No.

Senator CROSSIN—In evidence yesterday, ERA stated that they had a clear desire to have greater direct Aboriginal involvement in environment monitoring and management. How do you see the Mirrar people might be able to make the most of yesterday's public statement?

Mr Ralph—I suppose initially they would be fairly concerned that this could be seen as window-dressing and as trying to get a few more Aboriginal people on site to try to get support for the project. We have been on the mine site for a couple of years now helping the Supervising Scientist do some monitoring on Ranger mine. The traditional owners do not go anywhere near Jabiluka, even though they have been asked many times. There is a possible role for traditional owners to play in helping out with ERA in that regard.

Senator CROSSIN—So, if you were invited to the table to help devise, plan or even write the mine management plan, that may well be a good start?

Mr Ralph—Yes, I think we can write it.

Dr Mudd—I can add that, given Ranger will be rehabilitated sometime in the near future—and that is certainly the Mirrar's aspiration—there are discussions we will be having with the company over that, through the Northern Land Council and directly. So that is something where we can and will engage with the company because there are legitimate Mirrar interests to be recognised.

Mr Ralph—The traditional owners are scheduled to go on the mine site in a couple of weeks time to look at target rehabilitation et cetera.

Senator CROSSIN—There was a lot of discussion yesterday about event based monitoring. Some witnesses said that it does happen although there is no regulatory requirement for that. You are actually calling for it to be regulated in some way. What is the basis for that?

Mr O'Brien—I will hand over to Dr Mudd on that in a minute, but one of the main reasons is about looking at contaminant loads in the system. One of the best ways that we know of to do that is event based monitoring, with which you can measure flows, therefore volumes, therefore loads.

Mr Ralph—We have already mentioned the example on New Year's Eve last year at Jabiluka when 152 millilitres fell at the mine site and the north trib, I would imagine, would have been fairly well gushing but no dips were taken for over two days.

Dr Mudd—This is one of the things we have made a recommendation on in our submission. According to the environmental requirements, the current water quality trigger system excludes the effects of first flush. If you are going to exclude that, I think you need to do it on more than just the subjective basis of: 'Oh, well, that is good enough.' So one of the things we have recommended is that you need to match hydrology data to the concentrations. When you get a high flow event, you need to be able to match the concentrations over that full flow event so you can calculate loads properly. There are good statistical methods that do that; there are good scientific principles to enable that to be done. The concerns the Mirrar have are that the loads coming off the Ranger site and the Jabiluka site are increasing and the loads that are there are of concern, therefore we need to quantify them better. That can then feed into longer term biological studies on how much contamination and how much load have gone into the system. In the future we can then start to make better biological assessments of what impact that might have over 100 years or something like that.

Senator CROSSIN—I suppose that also leads to claims yesterday about whether the groundwater has been adequately addressed since the Fox report. What is your response to that evidence? I understand OSS have never had a hydrologist on board or as part of their team for the 20 years.

Dr Mudd—One of the concerns with rehabilitating a uranium mine site is tailings management—the long-term impacts on groundwater from tailings. In the course of doing a lot

of work on what those options should be for the Mirrar, I found the basic point that everyone always gets to is that you should return tailings to the pits. Then there are concerns about the long term, about how you model that over 10,000 years, as per the environmental requirements that you have to maintain the integrity of the tailings and have no impact for 10,000 years. Groundwater is the main pathway for that.

OSS have never had research projects to try to quantify what those flow paths might be. There is some early evidence from the time of the Fox inquiry and from work in the eighties, when Michael Haylen—this is detailed in our submission—documented quite significant flow paths through some of the carbonate units and documented that fractures in the rocks are quite important for transport. There is a lot of evidence at Nabarlek and right across the region for fracture-driven contaminant transport. On a lot of these sorts of issues, assumptions are often made, as was done for the Jabiluka studies, to just ignore fractures and permeable pathways like carbonate units and things like that, because they are not considered to be significant. If you look at a lot of the research in totality—what is there; not much is, only bits and pieces that you can put together—it does point to the fact that it is a much more significant issue than is actually being addressed.

Senator CROSSIN—Can you tell me why people at these mines talk about one in 10,000, as opposed to one in 100, when they are talking about flood factor implications?

Dr Mudd—For tailings, it is essentially to do with the radioactivity of the tailings. The radium activity has a half-life of around 1,600 years, therefore it would have lost about five half-lives and so would have decreased by something like 95 or 99 per cent in that time. Therefore by 10,000 years it should be a much lower risk. So for tailings you generally talk about a stability and no impact for 10,000 years. There is still some residual radioactivity left in the tailings from the uranium that is left over after that. When you are talking about surface water management, you generally talk about a one in 10,000 rainfall event or wet season because you are looking at the ability of the retention ponds to contain those contaminants on site. Basically that is a reasonable expectation, both by the Mirrar and the general public, for protection of Kakadu.

Senator CROSSIN—Including the tailings pond at Jabiluka?

Dr Mudd—There is no tailings pond at Jabiluka at the moment. There is a water retention pond.

Senator CROSSIN—The retention pond, sorry.

Dr Mudd—Yes, that is correct. It is worth noting that the original design of that pond was based on a value for a one in 10,000 year wet season. Through the World Heritage Committee process, it was realised that the data that that was designed on was a bit wrong. From memory it was about five or 10 per cent out.

Senator CROSSIN—You have called for more primary compliance points, particularly around the mine lease. I asked about that in our tour this morning and the response was basically that, instead of having compliance points, there are monitoring points around the mine lease where the company looks at the data and monitors what is happening. That is done

because it is seen as a warning system. It is their warning or their first indication that they have to do something before it gets to the compliance point. That would not be an argument you would find sustainable. You are saying that, under law or under the regulations, more compliance points should be established and they should be around the footprint of the lease; is that right? Why do you have that view?

Mr Ralph—I think they said yesterday that at the moment there are 88 points—I presume they are all statutory points on the Ranger project area, the RPA—but there is only one which has compliance, and that is 009. So anything can happen at the other statutory points. For example, there were 70 parts per billion in RP1 during the year with no penalty at all—it does not matter what it is as long as 009 remains below 5.8. Our view is that we should have proper guidelines and reasonable limits set for each one, around the various points of the mine site, and they should become compliance as well. You might have the same three-tier system closer to the mine site.

Mr O'Brien—It is difficult for us, too. One of the environmental requirements is for the company to minimise its impacts on the project area itself. We find it difficult to adequately assess that when the monitoring point that we receive most information on is five kilometres downstream.

Dr Mudd—Basically, Mirrar want to make sure that the footprint is constrained. They do not want to see the footprint continue to expand at Ranger. Retention pond 1 was supposed to be a sediment retention structure. It was not supposed to have low-grade ore dumped in the upper part of its catchment, in the tailings dam wall, and then become contaminated with uranium. For example, you could have a compliance system that said: 'If you go above 10 parts per billion, you have breached your compliance. There is a problem on the mine site and you have to do a lot more work to fix that problem,' rather than wait four wet seasons. I find it curious that the OSS and DBIRD waited four wet seasons after Mirrar raised these concerns before action was finally taken to say, 'We've got to fix the source of that low-grade ore' and to do that. If we had had that compliance point there in the first place, that problem would have been addressed much more proactively and the contamination that has been a cycle of pollution would not have been able to continue.

Mr Ralph—A problem for Mirrar is that all they see are sandbags when they drive past the dam wall if there is a problem. What other action has been taken?

Senator CROSSIN—Would the figures need to be higher at the compliance points if they were around the mine lease?

Dr Mudd—You could certainly make a case for, say, retention pond 1 that 10 might be appropriate there. If they have fixed the problem in RP1 this dry season, it might take a couple of years for the water to completely flush through and to get down to that value. So you might need a system in place for that. At the headwaters of Corridor Creek—where we have seen the leaks from the incorrect stockpiling this year and the concern about 14,000—maybe that value might be 1,000 but at the end of the Corridor Creek system, it might be 100 and at the land application areas at Djalkmarra it might be, say, 50. I am not sure. I do not know exactly what the values are; they are just examples as a rationale. I think it would be appropriate to develop specific levels that are appropriate to that part of the mine site and still maintain 009 as a

compliance point but constrain the operations so that the contaminants and the loads of those contaminants are known on the mine site and they are not leaking off the site more than Mirrar want to see happen.

Senator CROSSIN—Finally, you say in your submission—certainly in your summary and I think even in your introduction—that the regime for regulation is overly complex, confusing, inconsistent and incomplete. What do you believe needs to be done?

Mr O'Brien—As I said earlier, we would like to see a fairly major consolidation of all the legislative mechanisms that go into this regime.

Senator CROSSIN—That is both at the Territory and federal level?

Mr O'Brien—At the Federal level, mainly—the vast majority of it. A Commonwealth act would remove a lot of the ad hoc arrangements—the working arrangements, the letters, the memoranda of understanding, the ministerial agreements—and replace them with legislation. It should be noted, too, that the Mirrar had the Northern Territory government in court for a fair while a few years back over their right to issue the Jabiluka mineral lease. This legislation represents a significant move on their part. It would enshrine the rights and responsibilities of the NT as they stand today. They would remain the primary regulator and their roles would pretty much remain the same. You would, however, have a consolidation and simplification of the act, and legislative harmony with other Commonwealth legislation, like the EPBC.

Proceedings suspended from 4.06 p.m. to 4.26 p.m.

CHAIR—I understand there is a document you would like to table. Can you indicate to the committee what that document is?

Mr O'Brien—The document is a letter written from our major employer, Yvonee Margarula, to the environment minister, Dr David Kemp, on 10 May in response to the findings of the OSS and its report into the incorrect stockpiling at Ranger.

CHAIR—Is it the wish of the committee that this document be tabled? There being no objections, it is so ordered.

Senator WONG—First, I want to say how helpful I found your submission; thank you very much for that. There are two issues I want to clarify with you. As I understand it, your primary legislative recommendation is that you seek a consolidating act to be passed by the Commonwealth. The first question is: why the Commonwealth? I accept the arguments around consolidation of the current legislation; I do not think there is very much argument about the fragmented nature of the legislative arrangements which relate to Ranger and Jabiluka, but I am interested in why you would seek that to be proceeded with specifically in the Commonwealth parliament.

Mr O'Brien—I should introduce the comments by saying that, whilst it would be a fairly substantive overhaul, we would like to make it as least politically destabilising as possible. There are long-term agreements between the Territory and the Commonwealth that in the Territory the ownership of prescribed minerals is vested in the Commonwealth. Uranium is a nationally prescribed mineral. Also, by virtue of the place in which we are operating, the

Commonwealth has both domestic and international obligations to protect Kakadu. The Director of National Parks is either the leaseholder or landowner of Kakadu. The Supervising Scientist is a Commonwealth agency tasked with protecting the environment, conducting research and whatnot. It is about maintaining, as much as possible, the status quo on the balance of power for this mineral.

Senator WONG—Do you have any views about what office or what structure the Northern Territory supervising authority should be?

Mr O'Brien—We have not given it a lot of thought. You will notice that one of our comments is that we do not really believe in tinkering with the edges. We would not agree with those who would say—as I think the Supervising Scientist did yesterday—that you could incorporate some revisions of the Jabiluka ERs by altering the authorisation. To us, that is another ad hoc appendage to this Frankenstein regime. In relation to the Northern Territory government, we share the concerns of the ECNT: we are not entirely comfortable that the resource development department should be tasked with administering sanctions. That perhaps could go to an EPA of some form. We are open to that idea.

Senator WONG—But you do not have a more formed view than that?

Mr O'Brien—No, we do not.

Senator NETTLE—When we talked with DBIRD yesterday, they said they believed that rehabilitation of the mine sites would be no major problem. I am wondering whether this is a view that you share, particularly with regard to the expanding area of both sites being used for storing contaminated waste. Does that impact on the ability to rehabilitate?

Dr Mudd—One of the concerns we have always had is that the footprint is not just wetlands. There are waste rock dumps, tailings, irrigated areas and some quite massive physical change to the environment, as well as chemical and obvious radiation change. It is okay at the moment when you have 50 staff in the environment department spread across DBIRD, OSS and the company, running around the site on nearly a daily basis. When the site is rehabilitated and we walk away, that is when the real challenge starts. If you do not have people checking what is happening on a daily basis—where the water is coming out, what concentrations it might be and things like that—that is when the real challenge will start. That is when we will really be able to assess whether there has been any long-term damage, or how much that long-term damage has been. I do not think there is an extrapolation over time frames of hundreds of years to the 10,000 years, say, required for tailings. There are significant concerns about how you do those sorts of extrapolations. The company is grappling with these issues as much as we are. We would not claim to have the answers, but we certainly do not share that level of confidence.

Mr Ralph—It is fair to say also that officers of the Office of the Supervising Scientist and many other people as well have told me that the RPA will be unsuitable for human habitation for quite some time. It will be above the dose limit for residents for quite a while. In fact, Mirrar have asked if they will be able to plant fruiting trees, et cetera, and the answer is no. They have obvious concerns about maintaining their culture on the RPA once the mine site is completely rehabilitated.

Senator NETTLE—Another thing we talked about yesterday was the ISO 14001 standards. We have heard that the ERA are looking at implementing those. Do you see that as an improvement and as a way forward, in terms of environmental monitoring and regulations?

Mr O'Brien—From a non-technical perspective, we welcome it. It is not the panacea that some make it out to be.

Mr Ralph—I must say that they have been well and truly pushed to implement ISO 14001. You would have heard yesterday that the NLC have been asking for this since 1996. It was not until some healthy media from the Gundjehmi Aboriginal Corporation on 6 March that more proper negotiations began between NLC, OSS and the mining company about that implementation.

Dr Mudd—Certainly ISO 14001 talks about meeting stakeholder expectations. If it does not implement some of our recommendations, that would certainly be a disappointment to Gundjehmi and the Mirrar.

Senator NETTLE—Another thing we talked about yesterday was biological monitoring. We understood that there is not a compliance amongst any legislation for biological monitoring, but the company was saying that they do carry out biological monitoring. Do you think that the biological monitoring being carried out currently is adequate? Should it be made part of a statutory regime?

Dr Mudd—One of the concerns we have is that there is often a delay in the collection of samples and the actual analysis. There might be a year or sometimes a few years between when samples are collected and their analysis. There is no requirement as in, for example, if there is a leak on Tuesday, where is all the data by Friday? There is no requirement within the OSS for prompt reporting of a lot of their data. A lot of the biological monitoring is not part of the statutory authorisations or the environmental requirements. It is only empowered under the Alligator Rivers region or the Environment Protection Alligator Rivers Region Act, which is the act that establishes the Office of the Supervising Scientist. It was originally a research program designed to work out what is a good biological monitoring program. We think there needs to be greater accountability in that. We are concerned that it is now only done by the OSS, whereas really there should be a lot more done by the company. We are also concerned that it is not as extensive as it needs to be.

Mr Ralph—Yesterday Dr Finlayson from OSS said that these biological analyses occurred over a four-day period. However, it is the intervals that are important as one may miss an event. That is another reason we are putting in for event-based monitoring which would provide a more precise and accurate assessment of loads, and therefore potential biological impacts.

Senator NETTLE—Another thing we talked about yesterday was any proposed plans by the company for continuation with regard to ore body 3. We talked about underground mining and we heard from the company that they did not have any current plans to go down that path. One thing they did indicate they were looking at was the processing of low-grade ore from ore body 3. I am wondering whether you have any views about the potential effectiveness of that proposal.

Dr Mudd—One of the concerns that we have had for quite some time is that the footprint is already saturated. There is not much room or capacity left in the land application areas to keep absorbing contaminants. The wetland filters might work for a few more years but will they work for another 20 if they keep processing low-grade ore? That is one of the concerns we have. If they do look at processing low-grade ore, it extends the life of the Ranger mine and therefore places more strain in the long term on water management systems. That is where one of our concerns is. Also, as to the capacity for tailings, there may be room in pit 3 for that amount of tailings but, if you process all the low grade ore, there may not be. It all depends on what happens with that. Mirrar would much rather see the Ranger mine site finish mining open cut at pit 3 and then move towards rehab, rather than keep dragging it out. That is where the concerns come in. It is basically dragging Ranger out and the fact that the footprint is getting bigger, and the concerns about how much longer that will actually sustain in that same area and not grow.

Senator NETTLE—Another thing we heard about yesterday was liaison between the company and the Jabiluka mine site technical committee with regard to the water management system that we saw out there today, and whether that process had gone through the mine site technical committee. I understand the traditional owners are represented on that committee. Can you enlighten us any further as to whether that approval for the water management system at Jabiluka went through the mine site technical committee?

Dr Mudd—We understand that because of the crisis management approach that has generally been adopted for water management at Jabiluka, because it was known that the reverse osmosis unit was failing, that it would not last that much longer. ERA originally discussed irrigation at the mine site technical committee on, I believe, 1 or 2 October. It was discussed; it was not approved. There was no consensus agreed. The Northern Land Council as representatives of the traditional owners raised the issue with us, and before that it had gone back to a formal mine site technical committee—and there seem to be too many informal committees for Jabiluka, or MTC meetings, I should say. There was no formal committee and it was approved by the NT minister. The ARRAC report, the report of the Alligator Rivers Region Advisory Committee of December 2001, on page 7 says, ‘The OSS was not party to discussions which led to the derivation of these limits.’ That is basically talking about load limits monthly, and annual concentration limits for irrigation. Although the OSS and their advice are supposed to be taken into consideration, and consensus reached at MTC, that was not the case for irrigation last year at Jabiluka. And now we are seeing the effects of that—the fact that because it did not first go through thorough process, there has now been contamination of the tributary. We have legitimate concerns about that failure of due process.

Senator NETTLE—There was a similar issue that we talked about yesterday with regard to incidents that happened in February this year at Jabiluka, and whether—when the ARRTC meeting occurred in February—members of that committee were aware of the incident prior to the meeting. I think there is traditional owner representation there. Can you enlighten us as to whether the meeting was aware of that beforehand?

Mr Ralph—Yesterday the Supervising Scientist stated that he could not recall the date he was notified of those levels of contaminants at Jabiluka primary compliance JC, but he could recall the date he was notified of the incorrect stockpiling at Ranger. He could not remember when he learned of the elevated levels, as he suggested yesterday. Page 12 of the report of the Supervising Scientist entitled *Investigation of the Stockpiling and Reporting Incidents at Ranger*

and Jabiluka 2002 said that he first learned of this on 15 February. The ARRTC meeting which deliberated on the Jabiluka water management system passed the following resolution:

The water management system implemented at Jabiluka for 2001-02 wet season is protecting the aquatic ecosystem downstream at Jabiluka.

That meeting was held on 25-27 February, 10 days after the Supervising Scientist was first officially informed. So, while the Supervising Scientist may suffer from an apparent selective memory syndrome, the facts show that he indeed did know of the elevated levels at Jabiluka before and during the February meeting of ARRTC. Why he chose not to inform the committee of this critical information can only be surmised.

Senator NETTLE—I will leave it there.

Senator BUCKLAND—Dr Mudd, you made the comment a moment ago about the filter ponds, the filter system, that you do not know whether they will last another couple of years, 20 years or whatever. How long have they been going now?

Dr Mudd—The wetland filters that have been used to treat contaminated mine site waters and not just natural run-off, what I would call the RP2 wetland filter, has only been in operation since 1995, so it has been about five years. The ones that are now referred to in Corridor Creek have really only been started to be talked about in the last couple of years. But they have received run-off. There was an incident in 1992, and again this is a good example of why event based monitoring is needed. According to the Supervising Scientist, there was approximately 500,000 litres of run-off water from high-grade ore that discharged through Corridor Creek and led to the Magela primary compliance point at 009 actually being at the limit with 3.8, by calculated estimates, not by measured sample. That would have lasted apparently for almost half a day because of that incident. The load going through that system would have been quite significant. The levels found at the end of the Corridor Creek system was still 440 parts per billion, so there is existing contamination in that system. That is why we have concerns about how much more contamination, how much more load, can go through that system. We need to quantify that more.

Senator BUCKLAND—I understand that but, looking at that this morning as we did, there was bird life, there was apparent marine life and certainly the vegetation looked quite lush. That is seven years. I wonder what scientific basis you use to suggest that it may not last another three. I do not know; I have no ability to judge that myself.

Dr Mudd—If you look at a wetland system where the uranium is stored temporarily, you might get 60 per cent in one wet season stored in soils, you might get another 25 per cent, say, in plants and then you might get the remaining 15 per cent discharged through the system and some of that might get uptaken through algae, which are generally not studied in detail, which would then go into the food chain through fish and then to birds. Any wetland system, its soils, its plants and things like that, have a finite capacity. They can absorb 100, they can absorb 10,000 or a million. If you keep putting 500 through a system every year and the system can absorb 10,000, you have only got 20 years worth of capacity to absorb uranium. There are some studies about from the RP2 wetland filter looking at that sort of capacity and things like that. They always have ongoing review of a lot of that data. Even though it is stored there, if you

have an example where the wetland dries out it can easily be released, and that makes it more mobile again to be able to get into things like algae, fish and other things. So there has been some uptake; there is some evidence for that. A lot of it is not at an acute level that is going to kill fish, but there are concerns about chronic loadings. Drinking one glass of wine every day for 10 years is probably not going to do anything to you. If you drink 10,000 glasses of wine in one day it is probably going to kill you. The long-term effects of that one glass of wine over 10 years is a chronic effect; it is not something that is going to kill you straightaway. But at the end of that 10 years there might be some effect. That is the sort of approach that Mirrar want to look at—long term and not just one wet season.

Senator BUCKLAND—I appreciate that. I see from this that you are a consultant. Have the Mirrar people commissioned you to do independent tests and studies?

Dr Mudd—Essentially, my role within Gundjehmi and advising the Mirrar is to review a lot of the reports that we do get—things like the *Alligator Rivers Region Report*, the Supervising Scientist reports and the DBIRD reports—and advise them on rehabilitation options, say at Jabiluka. That is why I have generally argued, when I have looked at the data, that backfilling is a good option. You remove the source of the uranium getting into the pond; therefore, there would be no need for irrigation. That is generally the role I play. We have never sought to obtain our own independent samples and have them analysed. We are a community organisation, and we do not have those sorts of resources. My role is purely to review and liaise with the different groups, to try to understand it from a scientific point of view and to articulate my concerns. If I do not think there is a concern, I will say that and then Mirrar will give me their opinion. Those are our internal processes.

Senator BUCKLAND—So there is no independent sampling of the water or, indeed, of the flora?

Dr Mudd—No. Generally I have only ever reviewed the existing literature that is out there and talked to groups like the OSS and asked some of these questions.

Mr Ralph—What would you call ‘independent’? The Supervising Scientist claims to be independent.

Senator BUCKLAND—I understand that but, from listening to yesterday’s and today’s evidence today, there is some criticism of the OSS. I do not know whether it is justified; that is not for me to say at this stage. It worries me that no-one has commissioned some independent testing by, for example, a university. Let me tell you that I am concerned about it. However, I always think that, if there is a problem, someone will try to see whether the data you are examining is matching up. I have to say that I do not put a lot of weight on the report of an extremely high level of contamination, and I might not put very much weight on extremely low levels of contamination either.

Dr Mudd—I liaise with different university academics and other people in industry, so I do check with people the ideas and the interpretation of things.

Senator BUCKLAND—I am not questioning that. I do not have any further questions.

Senator WONG—I have one supplementary question which relates to the document you tabled, being the letter to Minister Kemp. Did you receive a reply to that?

Mr O'Brien—Yes.

Senator WONG—Was there any action taken by the OSS to deal with the concerns raised in that letter?

Mr O'Brien—No, there was not. The minister answered perhaps on behalf of the OSS. No doubt the OSS would have advised the minister how he should best respond to that issue.

Senator WONG—Which was?

Mr O'Brien—There are two. I am not sure which one you are asking about.

Senator WONG—I am looking at the one you tabled today.

Mr O'Brien—There are a few issues in it.

Senator WONG—Yes, there are.

Mr O'Brien—Which issue did you want a response to?

Senator WONG—I was more interested in the suggestion that OSS advice misrepresented the views of the Mirrar people.

Mr O'Brien—The response from the minister was fairly unsatisfactory to us. I have to be careful here. I will put it this way: he did not want to take on board our concerns.

Senator WONG—Is it correct to say that the OSS's advice formed the basis of some press comment by the minister on this issue?

Mr O'Brien—Yes.

CHAIR—Would you care to table the response you received from the minister?

Mr O'Brien—We can do that. I do not have it with me.

CHAIR—Perhaps you could provide it to the committee secretariat, when you are able to. Dr Mudd, let me go to the many recommendations you make about monitoring—they are probably the most extensive recommendations that the committee has received. I will start with the issue of biological monitoring. You pointed out a few minutes ago that timeliness was an issue. What about the range of biota that is being tested? Could you comment on the adequacy of that and what you would like to see with respect to biological monitoring?

Dr Mudd—The Mirrar people hear about these leaks or these problems at retention ponds et cetera and then they see birds in there. So one of the questions that the Mirrar people often ask

is, 'Can I shoot that bird? Can I eat it?' Again, it comes down to this chronic issue. If you look at some of the favourite parts of the different animals which are traditional bush tucker—whether they are plants or birds or things like that—you find that often they are not well documented in studies and they are actually missing in some of the historical work that has been done on biological monitoring. There are some particular biota that have been well studied; for example, mussels. Mussels have been quite well documented for radium uptake, but things like birds are perhaps less well studied.

CHAIR—Wouldn't mussels and their radium uptake be measured in this biological monitoring?

Dr Mudd—Yes. I cannot remember off the top of my head if that is actually part of the statutory authorisation or not, but things like that are important to the traditional owners. I think there needs to be more emphasis placed on a greater range. It might well be that, for example, in terms of radiation exposure, the way that those things are calculated is to come up with some sort of calculated radium radiation risk from that uptake. But the Mirrar people are not concerned with how low it might be or how high it might be; what they want to know is if their bush tucker is safe. They do not want to see any impact on that bush tucker. They want to be assured that the studies are extensive enough and can look at the full range of their favourite parts of the ecosystem.

CHAIR—So what do ERISS and OSS look for in those animals? Are they looking for effect on the whole organism or are they looking for actual measurements of radioactive material in the shells or the meat or whatever it is?

Dr Mudd—Generally what they call the ongoing biological monitoring program now is looking at things like snails, egg production, fish or things like that. There is also work being done on mussels. The OSS is happy to acknowledge that there is uranium uptake in muscles in the South Alligator Valley from former mines there. If you start comparing conditions from a very small mine with a very small, localised impact to another site, you find that there are fundamental differences as well as important similarities. I think that there are reasons why you need to have a much broader range than, say, just mussels, snails or fish; especially given that sometimes those samples take many months or years to actually analyse.

CHAIR—I turn now to the capacity of soil to retain uranium. You mentioned earlier that there is a range of soil types with different capacities to retain uranium. I have two questions. Firstly, how can you know what the capacity of soils to retain uranium is? Secondly, what sort of soil monitoring is taking place? For instance, earlier today we saw irrigation of particular areas. It is important to test those soils and has that testing being done prior to going ahead with the irrigation?

Dr Mudd—I will specifically differentiate between Ranger and Jabiluka. When they first started irrigating at Ranger in the mid-1980s there was an extensive research program done. They sampled sites outside irrigation areas and compared them to sites inside irrigation areas. Ongoing soil monitoring of the land application areas is part of the statutory program. It is important to look at the mechanisms, the processes involved in those soils, to determine whether the soils have higher clay content or organics or something else like iron, which can actually provide some sort of chemical basis to retain that uranium. Because of the acidity of the

rainfall up here, that is generally going to be a short- to medium-term process. Uranium is less likely to be retained in the long term because of the pH of the rainfall up here. At Jabiluka there were no studies at all before irrigation commenced on the capacity of soils to retain waters which did have high concentrations of uranium. The concentrations of uranium in those soils are extremely low, as I mentioned earlier. The soils within the disturbed area at Jabiluka are about an order of magnitude lower than average concentrations in the earth's crust. So it is quite a paradox: we have one of the world's biggest uranium deposits and yet surface soils are actually really low in uranium.

The soils there have no clay and they have no iron. I was trying to find a mechanism to say, 'Does that have capacity or not?' There are very low concentrations of most of those things in soils specifically at Jabiluka. After the irrigation last year, there have been some follow-up studies on that and there has been a much more detailed quantification of those things. Those reports are apparently about to be released. It is not a part of the statutory monitoring at Jabiluka. They do not have to continually monitor the soil, sample it and do a mass balance to say, 'We applied eight kilograms,' so that when they come back in five years time they are able to say, 'Yes, we can still find eight kilograms there.' If some has gone through the tributaries, maybe there will be only 7.9 kilograms left, maybe there will be only two kilograms left—we are not sure. When I looked at the soils at Jabiluka last year I raised that as a concern, and when I checked things like the draft environmental impact statement and the baseline studies there was no evidence that I could find that made me comfortable that there was retention capacity at Jabiluka. I will happily review the reports when they come out this year.

CHAIR—Thank you for clarifying that. You also mentioned the necessity for horizontal and vertical monitoring. What does that mean?

Dr Mudd—If you are looking at things like tailings or soils, if you are looking at loads, you need to have a proper system in place to be able to sample enough so that you can say, 'Yes, we have applied eight kilograms and we have enough samples to give us the statistical confidence to say that we can account for that.' If you are looking at a lot of ground water issues with tailings or seepage from retention ponds, you need to look deeper than just the surface soils. You need to be able to look at what happens in ground water and how much is transported in ground water. Often things like magnesium or sulfate are much more mobile in ground water so they will move a lot further more rapidly. One of the things that need to be clarified requires a look at the shallow aquifer systems because, if there is seepage into those systems, they often discharge to creek lines in the dry season. They can be very important as part of billabong hydrology and they are very important in maintaining refuge places for wildlife in the dry season. If you are looking at tailings, one of the reasons I have concerns about going above this RLO for tailings in pit 1 is that it moves from the deeper aquifer systems into the shallower ones. There is therefore a greater potential for vertical movement of contaminants. Maybe an approach could be that you could line that section—I do not know. If there is conclusive evidence presented to me then we will review it at the time. But certainly there needs to be a greater emphasis on being able to quantify loads and movement rates.

CHAIR—You suggest there need to be publicly available maps of monitoring sites. Are there not at present? I think there are some 40-odd sites at Ranger. Is no map of those sites available?

Dr Mudd—One of the things that are very poor is that with a lot of ground water information, for example, there are internal reports within the OSS and within DBIRD—and some of those are not public reports—that map out where the contamination has moved from places like the above ground tailings dam at Ranger, where there are seepage areas from retention pond 2. There is some public acknowledgment that there are seepage areas that affect the Magela Creek from the land application areas. We have documented that in our submission. A lot of that stuff is not translated into the public reports. It needs to be more systematically reported and therefore easier to present to traditional owners and to the general public when discussing matters that may or may not affect Kakadu National Park. I think it is a reasonable request that these things be done properly.

CHAIR—ERA told the committee this morning in their briefing that effectively we have event monitoring. You have indicated that this is not the case. Can you explain to the committee what you mean by event monitoring. How frequent would it be? What would trigger the monitoring? How responsive would you need to be? What does that mean in terms of OSS's capacity to do it, given they are now in Darwin? Can you fill in that picture of what event monitoring might be.

Dr Mudd—What we would recommend for event based monitoring is the use of automated samplers, based on the height of water in a creek or the flow rate in a creek. That way, at a certain flow rate you take one sample; when it reaches five times higher, you take another sample. You can set the criteria for when an automatic sampler is supposed to take a sample. That way, like we had at Jabiluka over New Year's Eve just gone, instead of having to have personnel on call to be able to go out there, samples are automatically taken. It removes some of the resourcing issues and makes it easier to be able to collect samples you can analyse. You can look at pH and EC—electrical conductivity or salinity—and get some indication of whether it might be a mine related source. Uranium, of course, will not be related to the salinity of the system: it is a heavy metal. You would need to take samples separately and analyse those for uranium.

There are a couple of good examples. A lot of the baseline studies for Jabiluka were done with event based monitoring. There were quite extensive studies done over the 1997-98 wet season, so ERA are familiar with the technique and the OSS are quite familiar with the technique. I believe that in a conference in Alice Springs about a month ago they were arguing that this set frequency—that is, testing every fortnight—is actually the wrong way to monitor. You are not going to pick up what could or could not be a mine related event, or follow and be able to articulate and discern what is a natural process versus a mine related incident. They are some of the reasons why we support event based monitoring: it removes subjectivity and it allows greater transparency and greater sampling to be able to document what is a discernible impact or change.

CHAIR—Would it be fair to say that ERA's version of event based monitoring was, 'There's been an event, some sort of spill or leak, let's rush off and take a sample of what the impact might be'?

Dr Mudd—That is probably part of it, yes. Also, they have used event based monitoring, but it is not stipulated in their general authorisation or the environmental requirements.

CHAIR—And you believe it should be.

Dr Mudd—I believe it should be.

Mr Ralph—It obviously operates in a fairly ad hoc manner. You may have heard this morning that Chris Leiner suggested that it was event based monitoring that picked up the stockpile incident—the incorrect stockpiling of 84,500 tonnes. The fact is that samples had been taken indicating very high levels of uranium. These were ignored. It was only after a Ranger mine worker walked past the half pipes and saw some fairly dirty water coming from the half pipes, which should have been fairly clear water, and they were measured, that they were alerted to the problem.

Dr Mudd—The other quick thing to add on the use of event based monitoring is that all the samples that were taken over March and April over the stockpiling incident were apparently remedied, but they were between 685 and 2,400 parts per billion. There was concern that there was a leak at 2,000, yet most of the samples after the problem—which were supposed to have been fixed—were still at 685 to 2,400, with one sample at 13,875. I think event based monitoring can give you very good and very quick information, document the impact and find whether a problem has been fixed or not.

CHAIR—Finally, what is your understanding of the current regime for the monitoring of ground water? Did the baseline data allow you or allow OSS to make a reasonable assessment of what changes have happened? Can you tell the committee about that?

Dr Mudd—One of the big problems in looking at tailings management in the long term is trying to quantify ground water—not just qualitatively describe it but also quantify and measure it. Tony McGill in his evidence yesterday said that there were studies going back to the Fox report, and that is correct. But during construction of Ranger and after its first couple of years of operation, the OSS and their consultants basically said that all the baseline ground water studies were of no value. There was no quality in continuing to use them. What was already an impacted mine site had to be used, as an attempt to say, ‘These are our baseline ground water conditions.’ DBIRD do check monitoring of a lot of ground water across the Ranger project area and, I believe, the ground water at Jabiluka as well. OSS do not do any independent monitoring or check monitoring of ground water. I think it would be perfectly reasonable to expect that, if they are doing surface water monitoring—given the tailings issues, seepage and things like that—they do ground water monitoring as well.

CHAIR—How easy is such monitoring?

Dr Mudd—You have to send personnel out there. You have to be able to, say, pump a bore. There are set methodologies for sampling ground water bores. It can be done. Basically, it is a resourcing issue in terms of people going out, having the right sampling equipment and then paying for the analyses, write-up of the data and publication.

CHAIR—Thank you very much for that. I am sure we could have spent even more time asking you some of those very technical questions. Thanks for your submission and for appearing before us today.

[5.07 p.m.]

ALDERSON, Ms Jessie, Member, Kakadu Board of Management

CHRISTOPHERSEN, Mrs Jane, Member, Kakadu Board of Management

NADJI, Mr Jonathon, Member, Kakadu Board of Management

NAYINGGUL, Mr Jacob, Member, Kakadu Board of Management

O'LOUGHLIN, Ms Gabrielle, Executive Officer, Kakadu Board of Management

CHAIR—Welcome. The committee has your submission, which we have already published. The committee prefers all evidence to be given in public but should you at any stage wish to give your evidence, part of your evidence or answers to specific questions in private you may ask to do so and the committee will consider your request. I invite you to make a brief opening statement.

Mr Nayinggul—I do not know if we will be taking up much of your time. My clan is in between here and Oenpelli—there is Jabiru, Oenpelli, and I am in the middle. My traditional land is at the far end of the park, but I have walked along with the Mirrar clan so far. We are very close; I try to walk really close with them. Jonathan and Jane are downstream of the Magela system. It is an important part to us, to our lives, to these people all along down the Magela system. The first thing is we were advised or told, ‘You got to be careful of allowing a mine in your country.’ But, as we all know, there was nothing we could do before the Ranger mine began—the deposit was found before there was the park. But it is true that we are next door, a close neighbour, to the mine’s traditional owners, and we are an affected people.

If anything goes wrong in those affected areas—we have heard so far of a few leakages, although not much radiation up in the air. But we have heard some stories that say Nabarlek is not well covered. That gave us a picture. The Nabarlek traditional owners do not like to have out-stations in their own homeland. They were going to use that strip for their own benefit, but nothing is happening. They all packed up and went down to the Oenpelli community.

The next thing coming along down the road is about radiation. Is that going to hit us from Ranger mine? Is it going to hit the environment both up in the air and on the ground? This is what we want to try and clarify and get straight down the line: what we are about to do in future if there is another mine coming along. Certainly no other new mine will take place in the park. These old ones we have will probably go away fairly shortly. But the bad part of the story is that. We can have good and bad at the same time, but sometimes if it is too bad, I do not think anyone will like it.

CHAIR—Does anybody else wish to speak?

Mr Nadji—I would like to say something. Thank you for letting us speak. Over the years I was not involved in the mining issues and I can only speak for my own views and my own

country and more or less support the traditional owner of the Mirrar and the Gundjehmi. When the mining agreement first was signed, the government and the company promised traditional owners that they would look after the country and make sure that nothing would happen over the years. But there have been leaks here and there that basically the traditional owner was not aware of at the time. I think over the years when there have been leaks here and there, the traditional owner did not get notified straightaway. It took them a couple of months down the track. Basically, that got a lot of people angry in the community.

We live downstream from there. We are also concerned because we live off the flood plain, gathering food. We like to know what is coming down the river, especially in the wet season. We know that we are getting scientists telling us this and that, but there are a lot of things that can carry these things to certain areas that we do not know about. That is all I want to say. I am supporting the Mirrar and the Gundjehmi views. We would like to see it a bit more controlled and more monitoring in these areas.

In the wet, this area becomes a big inland sea, so you do not know where the water can go. Also, you have underground streams that come out at the billabongs. The scientific version can tell us a lot of things about what is happening on top, but traditional owners have lived here all their lives and know what is going on. As a matter of fact, we are scientists as well. I have said enough; that is my point of view.

Mrs Christophersen—The monitoring is what the people are really concerned about. Before the injunction which my brother took out in 1997, we never had any knowledge or notices given; it was just done. Since then, OSS has been coming and giving us notice now and again. But we need it in simpler terms; we need better communication.

Ms Alderson—As one of the board members, and my country is in the centre of the park, the issues that I am worried about as a whole—not just from the park's point of view—are self-monitoring of environmental impacts by the mining company; the failure of the company to follow agreed reporting regimes; lack of transparent and timely reporting to the board, including reporting on changes in on-site environmental protection arrangements and reportable incidents; the ability of the Supervising Scientist agency to work as both a monitoring and compliance body; and the lack of clarity in how the current water management regime operates, particularly in relation to wet season viability. That is all I wanted to say.

CHAIR—Has the Kakadu board of management taken these concerns to the Office of the Supervising Scientist and the ERA? If so, what has been the response to your complaints about not being properly informed and monitoring being inadequate?

Mr Nadji—I do not know where to start. A traditional owner, a Mirrar Gundjehmi elder, came to the board of management asking for support to see if there was a better way of having this monitoring information given to us earlier than a couple of months down the track. We came as a group of traditional owners from various parks, supporting their views. Like I said, over the years, those are the things that were promised to us and they have not fulfilled their promises. We just want to make sure that we do get told what sorts of things are coming down—more or less the day-to-day things that the scientific service is monitoring—and get more traditional owners involved in the monitoring areas, so we know what is happening, what

is coming out of the mine and where the waste goes. To be honest with you, I do not really know where the uranium goes and what it does. Things like that need to be told to us.

CHAIR—Mrs Christophersen, how frequently does the Office of the Supervising Scientist speak with you about these issues? You said you had some briefings but often did not understand them.

Mrs Christophersen—They do not speak with me personally, but we go through the Kakadu Board of Management every three months and they may get in touch with Gabrielle, who is the secretary. If there were any problems, she would get in touch with all the board members.

CHAIR—How would you like to change that system? Do you have a suggestion about how you would like to meet with OSS or ERA?

Mrs Christophersen—I would like to see the situation where, if there were any problems, the clan groups would have a notice sent to them to let them know. Then they would get in touch with their own associations to have their meetings and so on.

Ms O'Loughlin—I would just like to clarify some of the questions that you have been asking. The Kakadu Board of Management does not have any formal relationship with the ERA company because it is excluded from the park. So the Kakadu board does have a relationship with OSS. They generally provide a pre wet season paper to the board based on their predictions of rainfall over that oncoming wet season. Then, after the wet season, they provide a post wet season paper, which is basically what happened at Ranger and Jabiluka.

In the past, they have actually approached the board and given a face-to-face presentation. The board does have a very busy agenda so it has recently requested that papers be provided. These are given to every board member and talked about. The nature of radiation and uranium mining is quite confusing and difficult to understand so the paper contains a lot of rainfall predictions, parts per billion figures and what they think should happen at those sites.

CHAIR—Aside from the environmental questions, can you let the committee know what your concerns are with respect to sacred sites, particularly at Jabiluka?

Mr Nayinggul—Sacred sites can be damaged by radiation. If radiation gets in between what we try to teach young people and access to the sites, any sites at all, then we are not going to be able to educate any of our young ones. The problem we will have is that it will become a river in between the sites and us. It does not matter where Aboriginal people come from—I do not know if they work in the underground mines; I have not seen any full-blooded Aboriginal person working underground in the mines—but Aboriginal people, even if the mining companies clean around the outside of the mine and are really careful, as soon as they hear about uranium being about they think, 'Look out.' That is what happens to our sites. The mine does not hurt the environmental part of the sites. The paintings on the walls or on the ceilings of the caves will not fall off, but the radiation will stop the teaching of the young people by the elders. It will affect that. It will make it very difficult to get youngsters to those areas.

We can get around it by taking young people to other sites on the land of other clans, but that is not their own traditional land. We can tell people why our youngsters did not learn their own

heritage: it is because of the mine. I would not like to tell my children or grandchildren why I cannot take them—unless they really want to know. It will also be really difficult to visit hunting sites. Even visiting other clans, tribes visiting other tribes like we used to, will be difficult. We do not know if we will be able to visit one another, even using vehicles. For example, we would have to cut across creeks which have uranium contamination. I would like to hear how we can overcome these sorts of fears.

Senator CROSSIN—Thank you for coming today. Has the mine or the OSS ever tried to talk to the board or give you a story about what is happening at the mine, what uranium and uranium mining is about and the kinds of safeguards they have got for the environment? Has that been explained to the Kakadu Board of Management in your time?

Mr Nadji—The scientific service have been coming out to communities and also employing Aboriginal staff to go out and do monitoring, so some Aboriginal people have been involved with working with the scientific service. They have been reporting over the years, but not as regularly as they would like. Mainly, when it does happen, they come out and explain to people. For instance, I have had contact with the scientific service and they have been letting me know about the downstream side of the river, but most of the monitoring is done close to the mine. I would not know what is happening there; I just know that they have been involved in employing people and showing them how uranium can affect the animals and things like that.

Senator CROSSIN—Has anyone tried to explain to the members of the management board of Kakadu what kind of monitoring they do, why they do it and what happens when they find a problem? Has that been explained to all of you?

Mr Nadji—Yes, there was a board meeting about two months ago and they started to talk to us about it. It is good that they are doing it. Without the scientific service, I think some of us would not really know what is going on.

Senator CROSSIN—In the submission you wrote to us you say:

After all the years of uranium mining ... we still cannot say that we have full confidence in these regulatory and reporting regimes.

What has to change so that you have confidence and you are happy about what is going on?

Mr Nayinggul—On the scientific side, we have heard a lot about what they know and what they have told us since the mine started and kicked off in full swing. Somewhere along the track people from the monitoring areas or the scientific side came to Aboriginal people and they even came over to Oenpelli community to tell us what is going on here and about Nabarlek. But the story I have picked up in all that time, in all those many years from the start of the life of the Nabarlek mine and the Ranger mine, is that the scientific side is behind a cloud. It is just like you have got cotton wool, and you talk about things behind the cotton wool or a big dark cloud that you cannot see through to what somebody is trying to explain to you.

It is one thing because it is scientific. As we all know, anything we touch, walk on and exercise on is a different story. The scientific site I think needs to be clarified a bit more in a highly qualified manner, in such a way that Aboriginal people understand. I do not know; it

might go to both Aboriginal and non-Aboriginal people. It is a very difficult thing to try and see. You can hear it. It tells you on maps how much up in the air, how far, how low, what it does when the spill is being released, but the scientific site is a very difficult part to try to explain. We have not got to that point yet. It is the heaviest difficulty I have ever tried to understand.

Senator CROSSIN—There would be a few of us with you there, I think, after the last few days.

Mrs Christophersen—It is a wet season that a lot of people are worried about because we have a lot more floods and all the rivers get flooded. This is where they have said they have got water coming from the retention pond that goes out, and that is the time when people worry—in the wet season—and that is when we would like to know how it is working.

Senator CROSSIN—Should the company or OSS ensure that there is some committee set up or should they make sure they talk to you more than before and after the wet season but continually through the year? What do you think needs to change to make things better in terms of communication?

Mr Nayinggul—Close communication. It is better than having to wait for a board meeting. How many times do we have board meetings?

Ms O’Loughlin—Every three months.

Mr Nayinggul—That is a bit too long. It should be in between, or twice, or they should go and contact traditional owners and tell them what is happening to the area before it comes to the board, I think.

Ms Alderson—The wet season should be more so because of the water flowing around everywhere. The thing is you do not get to know about it until you read about it in the paper or you hear it from other people that live up in this area, and it sort of spreads all along the out-stations until you get to hear about it. Then again you cannot do anything then because it is either already happening or it has gone. That is what I find very hard.

Senator CROSSIN—Even though the company is obliged to let the NLC know, and I am assuming the chain is that they then let the Mirrar people know, you are saying that there are other groups in this area—

Ms Alderson—Yes, but I doubt whether the Mirrar Gundjehmi even hear about it because I think we all get to hear about it at about the same time when it has been done and gone.

Mr Nadji—Most of the things usually happen in the lease itself, in the mining lease. Outside of that obviously there is monitoring and letting us know. That is usually only if they pick up things, but it is not as strong as what people believe. Most of the things that are happening are more or less in the lease itself, so those are the things that basically we do not hear about until a month later or something like that. I think some traditional people basically get frustrated by hearing it later on down the track instead of hearing it the day after so we can sit down and talk about it and stuff like that. I think that is the most frustrating thing.

A lot of things basically go down to the river and a lot of those areas are close to the main Magela system where the community is not far away, like Mudginberri. Not only that, a lot of the traditional owners around here go hunting in those areas. I think the Mirrar Gundjehmi traditional owners are very frustrated when that sort of thing happens because in those areas they do go out and hunt and when that happens they think, 'Gee, are we affected by the uranium?' So I think constant monitoring and constant reporting to the traditional owners about what is happening on the lease itself would be much better.

Senator SCULLION—Jacob, I was very interested to hear your analogies about trying to cross the river and particularly your concerns about ensuring that your children have access to that same educational and cultural experiences that you had. You talk about the river, and I have heard some things that Jonathon and Jane have said about their real worry that there is uranium in the river and in the system and that it will affect people and may even prevent you from travelling in the country. Where do you get a lot of this information from? Do you read it in the newspaper or is it just discussions that people have? You say, 'People come and tell me things.' Who talks to you about those things?

Mr Nayinggul—No-one, actually. I gather this myself. If there is a leakage like we heard about of fumes, small ones, there is nothing bad actually happened. But if it was big, what is going to happen? I am thinking about that perhaps happening. I am prepared for what is going to hit me.

Senator SCULLION—Many people, including people who live in Darwin and around the Northern Territory, when you read the paper and you hear words like major uranium leak it makes me frightened too. But over the last two days I have learnt that what it said in the paper was nothing to be frightened about; it was simply a level that was raised and people looked for what that was but it was nothing to be worried about. I also hear that in the whole time the mine has been there, outside of the mine there has been no impact whatsoever. How do you think we can communicate? There is a very good suggestion here from Jonathon in your letter that says that the responsible authorities should communicate more clearly how environmental protection and water management at uranium mines need best practice standards. How do you think we can communicate this better? We have spoken about it, but do you have some ideas about how we can actually communicate it?

Mr Nadji—I do not have any ideas, but once when I was a trainee ERISS more or less organised a day thing through their science lab and showed us what can get affected and so on. Those are the things that need to be done on a regular basis so that people who want to know what is going on can see how far the uranium can travel from the lease itself. These are things we are not sure about. People say that the water volume will break up the uranium. Anybody can say that, but you do not know how far it is going to travel. If it is a big wet, how much greater volume of uranium is going to flow down the river and how far is it going to get? We do not know when it is going to happen. It probably will not happen until you and I are dead or something like that, and that is when the thing is going to start affecting people.

Senator SCULLION—So do you think perhaps rather than communication there needs to be an education program so people can learn more about all these systems and how we talk about these systems? Do you think some sort of workshops out here would be valuable for that?

Mr Nadji—I found that to be pretty good because it gave me an understanding of the sorts of native animals that will be the first to be affected. People are saying it is the mussels. We are not sure, but the mussels usually die when it is really hot, at this time of the year. They die and never sell. Some people say it is fraud, so we do not know what is really going on. An honest answer to an honest question would be great.

Mrs Christophersen—I am not sure whether they monitor it every day. They monitor it every day over the rainy season. I was thinking that every week they should send something to the board to say how the water level is going. So that keeps all the people informed one way or the other.

Senator SCULLION—I can see that your representative from the mines is scribbling that down right now. Hopefully it will be heard.

Mrs Christophersen—The rainy season is the worst time. That is when people are really worried. It is not so much in the dry season.

Senator SCULLION—Do you think it is worth speaking with Jonathon about having an educational program come to this area to teach people a little more about the words we use when we are talking about these things and to get an understanding of how big or how small an event has been? Do you think that would be useful?

Mrs Christophersen—Yes.

Senator SCULLION—Do you think the board could play a role? Do you think that somebody coming to the Kakadu Board of Management to talk to them would be a good start?

Mrs Christophersen—They did this the last time: people came here and explained everything. In the 25 years that I have been here—although I have not been on the board for that long—it is the first time that I have ever seen anything explained. You live here and you do not hear anything.

Senator SCULLION—Who was it who came to talk to you?

Ms O'Loughlin—It was OSS, Alex Zapantis.

Senator SCULLION—Perhaps we should look to making sure that that explanation that you got is given to other people as well. Would that be of use?

Mrs Christophersen—To all the other associations at least, so they can let their people know.

CHAIR—Thank you so much for appearing before us today. It has been really helpful. Is there anything else you want to tell the committee, Mr Nadji?

Mr Nadji—My understanding are that ERISS is moving into Darwin. What will happen to the monitoring program? Will they still be around? These days you do not know, with the

government cutting funding and stuff like that. Will they still be here as the watchdog for the mine?

CHAIR—Perhaps we should invite OSS and ERISS to inform you about their proposals. That is probably the best way to do it rather than for us to tell you. They are in a good position to do it. Thank you for coming, it is much appreciated. That concludes our hearing today. I also thank all those in the audience for coming.

Committee adjourned at 5.43 p.m.