

Alligator Rivers Region Technical Committee

11th Meeting

17-19 February 2003 – Darwin

Summary Record of Meeting

MEMBERS PRESENT

Prof. Barry Hart	Independent science member (Chair)
Mr Ray Evans	Independent science member
Ms Jill Fitch	Independent science member
Dr Carl Grant	Independent science member
Dr Terry Hillman	Independent science member
Dr Douglas Holdway	Independent science member
Mr Mark Foy	Northern Land Council
Dr Arthur Johnston	Supervising Scientist
Mr Tony McGill	Department of Business, Industry and Resource Development
Dr Tony Milnes	EWL Sciences, representing Energy Resources of Australia
Mr Peter Wellings	Parks Australia North

SECRETARIAT

Mr Ian Loftus	Secretariat
Ms Ann Thompson	Secretariat

ADVISORS AND OBSERVERS (PRESENT FOR ALL OR PART OF MEETING)

Mr Alex Zapantis	Office of the Supervising Scientist
Mr Peter Waggitt	Office of the Supervising Scientist
Dr Max Finlayson	Environmental Research Institute of the Supervising Scientist
Dr Chris Humphrey	Environmental Research Institute of the Supervising Scientist
Dr Ken Evans	Environmental Research Institute of the Supervising Scientist
Dr Paul Martin	Environmental Research Institute of the Supervising Scientist
Dr Peter Bayliss	Environmental Research Institute of the Supervising Scientist
Dr Bob Pidgeon	Environmental Research Institute of the Supervising Scientist
Mr Mike Saynor	Environmental Research Institute of the Supervising Scientist
Ms Alicia Hogan	Environmental Research Institute of the Supervising Scientist
Mr Dene Moliere	Environmental Research Institute of the Supervising Scientist
Ms Kirrily Pfitzner	Environmental Research Institute of the Supervising Scientist
Ms Jacqui Ravis-Hermann	Environmental Research Institute of the Supervising Scientist
Mr Alan Hughes	Department of Business, Industry and Resource Development
Ms Pamela Sanders	Department of Business, Industry and Resource Development
Dr Wayne Erskine	NSW State Forests
Mr Julian Barry	Parks Australia North
Mr Nathan Harris	Parks Australia North
Dr David Klessa	EWL Sciences
Ms Anja Zimmermann	EWL Sciences
Mr Ian Hollingsworth	EWL Sciences
Mr Don Stockton	EWL Sciences
Dr David Jones	EWL Sciences

APOLOGIES

Prof. Gerald Nanson Independent science member
Mr Shane Maraldo Pioneer International Ltd (representing Queensland Mines Pty Ltd)

WELCOME

Barry Hart opened the meeting at 0900 and welcomed members, advisers and observers. He outlined the structure of the agenda, including the strategic planning process, and asked members to declare any conflicts of interest. No members declared any conflicts of interest.

The Chair and members of ARRTC congratulated Dr Arthur Johnston on his recent award of the Public Service Medal for outstanding public service in the development of environmental standards, particularly relating to the Kakadu National Park, ensuring the highest levels of scientific integrity of the environmental research programme.

MINUTES FROM PREVIOUS MEETING (9-10 SEPTEMBER 2003)

The Summary Record of the meeting held on 9-10 September 2002 was accepted without amendment. A motion accepting the Summary Record was moved by Doug Holdway, seconded by Jill Fitch, and was carried.

BUSINESS ARISING FROM PREVIOUS MEETING

Barry Hart summarised the actions arising from the previous meeting and advised members of the method he proposed dealing with these items.

A number of papers were provided in response to issues raised the previous meeting of ARRTC. Most of the papers were prepared by *eriss* staff and Barry Hart acknowledged the efforts of Dr Max Finlayson and his staff in producing these papers.

Mark Foy advised the meeting that he had not been checking his e-mail on a regular basis, and did not attempt to access the secure ARRTC website until the weekend of 15-16 February when the site was unavailable due to upgrading. He did not, therefore, have copies of the meeting papers and considered the process for distribution of papers to be less than satisfactory. Arthur Johnston responded, suggesting that an individual member's failure to read his e-mail did not make the process unsatisfactory. Other members expressed their satisfaction with the secure website for making papers available.

Ian Loftus advised that he had sent a number of e-mail messages to all members over a period of several months advising them of the secure ARRTC website and that alternative methods (such as printed copies or CD-ROM) would be used if any member made a request.

Outcome/Action: Ian Loftus to talk to Mark Foy about alternative means of providing meeting papers.

There was then discussion on ARRTC workloads, with members discussing:

- The ability of members to deal with the large volume of information, and whether they could effectively carry out their functions;
- The need to maintain a balance between proactive and reactive (and operational and strategic) activities, with an appropriate strategic focus;
- The level of detail in reporting that ARRTC was seeking, particularly from *eriss* and EWLS;
- The differing expectations of various stakeholders, with Barry Hart using the level of questioning in the current Senate Inquiry as an example of how expectations at the political level were different from expectations at other levels;

- That the MTCs are the forum for operational approval issues but that they are not comprised of scientists;
- The need to focus on selected issues in the absence of the ability to deal with all issues simultaneously; and
- The appropriateness of engaging consultants to undertake work, which is dependent on funds available.

Barry Hart noted that the Nabarlek site had not been reported in great detail through the ARRTC process recently. He noted that the Nabarlek representative was not at the meeting. He added that a visit to Nabarlek at the next ARRTC meeting would be useful. Max Finlayson also drew attention to the past scant attention that had been afforded to the Koongarra site and whether some strategic thought should be given to considering what information may be required in the future.

Outcome/Action: A site visit to Nabarlek will be scheduled for the next ARRTC meeting.

ARRTC asked for a scoping paper to be prepared on remote sensing (What is currently being done by eriss and why? What is the scope for future applications in the ARR and what are the knowledge gaps? What are the resource implications if expanded?) This may need to be modified in light of comments after the meeting, vis-à-vis ensuring the paper canvassed the reasons why the remote sensing was required, rather than detailing what remote sensing could do.

Kirrily Pfitzner and John Lowry talked to the paper ‘Remote Sensing and Geographic Information System activities in the Supervising Scientist Division’.

Kirrily Pfitzner highlighted the distinction between remote sensing and GIS then gave an overview of remote sensing. John Lowry then talked about the opportunities and challenges of GIS and the types of data available.

ARRTC noted that discussion on:

- The usefulness of this type of technology in detecting things that would be difficult to detect through ground-based surveys, and through allowing targeted ground-based surveys such as in the South Alligator Valley;
- The remote sensing and GIS activities being program driven rather than technology driven; and
- The compatibility of *eriss* data with NT Government data.

Tony Milnes showed members samples of Quickbird satellite imagery that EWLS uses for the Ranger and Jabiluka sites.

Jabiluka/Swift Creek - ARRTC noted that the current sediment-modeling project in Swift Creek was being wound up and that the focus would move back to the Ranger site. However, ARRTC felt that there is a need to take a more strategic view of the R&D requirements to better place the Jabiluka activities into the broader catchment context. This could be achieved by clearly articulating the immediate future of R&D and monitoring associated with the site.

Ken Evans talked to the paper ‘Sediment Modelling’, giving the members an overview of developments.

This was followed by general discussion on the model, including discussion on the frequency of monitoring and on the variability of data. In particular, the ability of the model to detect small increases in turbidity downstream of the mine was queried.

Outcome/Action: ARRTC members commented that they would like to see the model further developed/justified to address the type of changes that can be detected. ARRTC advised that it would be in a better position to comment once the model is further developed. It was suggested that a power analysis may be needed and/or the sensitivity of the model as a monitoring tool addressed.

ARRTC recommended that the situation of the commercial radioactivity measurement laboratory be reviewed.

This issue was briefly discussed and members noted that it was primarily an operational management decision for the Supervising Scientist.

ARRTC would like to see a conceptual model of the system developed as project planning and implementation occurs, with transport pathways clearly shown and best estimates of the loads/fluxes of contaminants shown.

Max Finlayson talked to the paper ‘Conceptual model of ecosystem processes and pathways for pollutant/propagule transport in the environment of the Alligator Rivers Region’ and provide an overview of the key themes identified in the paper.

Members discussed a range of issues in relation to the paper, including:

- The need for a “predictive” capacity, looking forwards towards mine closure and rehabilitation;
- The level of detail provided in the model and the effort and value of developing this;
- The relationship between strategic and operational level models;
- New issues such as information exchange (communication and consultation) and the generation of new knowledge; and
- The challenges of long-term modelling.

Outcome/Action: Barry Hart indicated that the conceptual model would help facilitate the strategic planning process and should be developed further as project planning and implementation occurred.

ARRTC requested information on the future of ecotoxicity testing and resource implications.

Peter Bayliss talked to the paper ‘Ecotoxicity Testing’, and advised that three broad options were now available:

- Option 1 – to close the ecotoxicology laboratory;
- Option 2 – to maintain the status quo; or
- Option 3 – to maintain the status quo but look for further opportunities to expand (that is, commercial activity).

He advised that external funding would be required to continue operations after the end of the current financial year.

There was then discussion on:

- The need for an ongoing toxicology capacity within *eriss*;
- The possibility of outsourcing ecotoxicology functions, which was considered possible but unsatisfactory as providers are interstate;
- Possible linkages with the NT University; and

- Whether ecotoxicology resources could be used for other *eriss* research activities.

Outcome/Action: ARRTC noted that some ecotoxicological research was still occurring, although not a great deal, and that ecotoxicological issues should be addressed through the strategic planning process, and then considered as part of the overall priority list of actions.

ARRTC asked Gerald Nanson and Ray Evans to develop reasons for the collection of hydrological data in the ARR.

Dene Moliere talked to the paper ‘Hydrological Gauging Network’.

Arthur Johnston tabled a copy of the Department of Infrastructure, Planning and Environment response to his letter in relation to the gauging network.

There was general discussion on the issue of hydrological gauging, with emphasis on the following themes:

- The intention of the Department of Infrastructure, Planning and Environment to cease operating a number of hydrological gauging stations;
- An earlier funding agreement (the “reimbursement agreement”) between the Northern Territory and the Commonwealth in relation to mining-related hydrological gauging stations, which ceased in 1984 when Commonwealth-Northern Territory funding was “normalised; and
- The likely minimum data requirements of hydrological gauging in the context of both research and monitoring programs. Peter Wellings indicated that parks Australia supported the comments being made by the Supervising Scientists on the need for an effective network of stream gauges and would be disappointed at the loss of the existing network and record; and
- It became apparent during discussion later in the meeting that some gaps have already been identified in the hydrologic data network (for instance, Gulungul Creek), that these gaps are not covered by the discussions on the existing network and that a more strategic analysis of data requirements is crucial.

Outcome/Action: ARRTC noted that the nine current hydrological monitoring sites are essential, and requested an analysis of a broader network of gauging stations to assess issues that may arise. An assessment of additional needs to be undertaken by the next meeting of ARRTC, in the context of the strategic planning process and within the context of the data and information requirements to effectively measure hydrologic system performance during mine closure. Arthur Johnston would contact the DIPE and further discuss funding of the existing stream gauging network.

ARRTC requested a short paper on eriss’s assessment on how and where ecological risk assessment will be used in the future

Peter Bayliss talked to the paper ‘Ecological Risk Assessment (ERA) & Ecosystem Models’, which was followed by discussion on:

- The benefits of such a model for risk assessment;
- The usefulness of such models, and the linking of separate sub-models;
- The use of models for communicating information to Traditional Owners; and
- The challenges posed, and capacity of *eriss*, in the area of modelling

Outcome/Action: ARRTC members supported the use of ecological risk assessment and ecosystem models as an approach, noting their usefulness in identifying risks and knowledge gaps, and helping communicating information, and where possible providing quantitative information for management decision making.

Carl Grant to discuss the revegetation at Ranger with EWL Sciences and report back

Carl Grant gave a presentation on revegetation issues, and then answered questions. This presentation raised a series of questions and issues that Carl believed were currently not being well addressed in the ARR. Carl was of the opinion that unless these were addressed now and answered quickly that successful revegetation would not be achieved. He stressed that this effort should not be under estimated. The example of Nabarlek was used to demonstrate the difficulty with successful revegetation, including the difficulty of reaching agreement on criteria for measuring success .

Terry Hillman to discuss the whole ecosystem monitoring project further with EWL Sciences and report back

Terry Hillman provided a brief report to the meeting and undertook to look at this further in discussion with EWLS.

The committee asked for a status report on the landscape-scale project next meeting, including further information on internal projects

Max Finlayson talked to the paper ‘Progress report on landscape-scale analyses of the ARR’, giving the meeting an update on developments since the last ARRTC meeting. He also informed the committee that a technical paper had been submitted to the International Association for Landscape Ecology conference being held in Darwin in July, and that consultation was continuing with stakeholders in Kakadu.

Outcome/Action: ARRTC members noted progress.

Members to provide comments on the Review of mine-related research in the Alligator Rivers Region 1978–2002 by 30 September.

Barry Hart advised that feedback had been provided.

Tony Milnes, Arthur Johnston and Barry Hart to produce a summary of the major issues in the paper Review of mine-related research in the Alligator Rivers Region 1978–2002, and then discuss at a meeting with the seven Independent members – time and place to be decided.

Barry Hart advised that a draft summary document, ‘Summary of ERISS Research’ has now been prepared and is available for consideration and discussion by ARRTC members during the strategic planning process. This was supported by a summary of the current *eriss* workplan.

It was noted that the document’s title should refer to all research rather than simply *eriss* research.

A review of radiological monitoring and assessment programs was requested for the next meeting.

Paper (‘SSD Radiological monitoring and assessment program’) has been prepared by *eriss* and is available for consideration and discussion by ARRTC

There was some discussion on radiological monitoring in relation to the difference between public and worker protection.

Tony McGill advised that an audit of the Ranger radiation monitoring program would be taking place, and is being conducted by a group consisting of representatives from several agencies. The

Australian code of practice is providing the framework for the audit. Mark Foy advised that this group is meeting monthly.

Outcome/Action: Note: The paper refers to eriss monitoring only, as the ERA radiological monitoring program is under review. Discussion of radiological monitoring issues will be deferred until the next ARRTC meeting to allow for review findings to be considered.

ARRTC's review of the Supervising Scientist's stockpiling report to be modified by the Chair in light of explanations provided by SSD and finalised out of session.

Barry Hart advised that he had not yet completed the revision of ARRTC's comments on the Supervising Scientist's stockpiling report, not noted that he would do so out of session.

SSD and ERA to provide comments on Ray Evans' paper on water management at Jabiluka and Ray will then complete the report before next meeting.

Barry Hart advised that the document produced by Ray Evans (and including comments by ERA and the Office of the Supervising Scientist) had been made available to members prior to the meeting. This issue is addressed elsewhere in this *Summary Record*.

David Klessa to email members the ERA annual environmental report. Alex Zapantis to email members SSD six monthly reports to ARRAC.

Barry Hart advised that both of these actions had occurred.

Comments from members on the ARRTC Business Plan to be provided to Barry Hart by 11 October 2002.

Barry Hart advised that feedback had been provided.

Jill Fitch to be provided with details on the radiological standards for South Alligator Valley rehabilitation.

Jill Fitch advised that she had been provided with the information she requested.

A progress report on SAV rehabilitation to be provided at each meeting.

Barry Hart advised that an update would be provided as part of Parks Australia Member Report later in meeting.

Peter Wellings to report on progress on KRSIS implementation at the next meeting.

Barry Hart advised that an update would be provided as part of Parks Australia Member Report later in meeting.

Barry Hart to write to the minister about funding of Doug Holdway's continuing membership.

Barry Hart advised that this issue has now been resolved, with the Minister agreeing that Doug Holdway should remain a member of ARRTC.

Barry Hart to discuss payment of out of session work with Arthur Johnston and report back within a couple of weeks.

Barry Hart advised that this issue has been discussed and resolved.

Progress Report on Stream Monitoring

Max Finlayson talked to the paper 'Progress Report on Stream Monitoring' and Paul Martin and Chris Humphrey described the processes associated with monitoring of mussels, and that they are looking for changes rather than just target levels.

Max Finlayson noted that ARRTC had endorsed the program at an earlier meeting.

There was then some discussion on:

- Whether levels were total or dissolved;
- What the data was used for; and
- Whether the appropriate level of data was being provided to ARRTC.

There was further discussion on monitoring issues, particularly in relation to uptake in mussels. Some members queried why this monitoring was being undertaken. Alex Zapantis advised that radium in the water column was concentrated in the flesh of mussels, which was consumed by Aboriginal people, but noted that almost all the radium in the water column, and consequently in the flesh of the mussels was natural, not from the mine. The monitoring is looking for change rather than comparing radium concentrations in mussels to set trigger levels. Arthur Johnston advised that process gives a broad assurance, but that changes would be picked up in water well before being detected in mussels. Peter Waggitt advised that information was of important use when communicating with Aboriginal people.

Max Finlayson advised that they had not found other mining sites that were as intensively monitored as the ARR sites. He offered to provide further information at future ARRTC meetings, in particular on the Donana National Park, Spain, mining issues.

Peter Wellings and Max Finlayson noted that the International Union for Nature Conservation (IUCN) and the ICMC are setting up a program to look at issues of mines in high conservation value areas, and that the World Heritage Committee is also interested. This was likely to be reported at the World Parks Congress in South Africa later this year.

Outcome/Action: ARRTC members noted that the information being provided assures them that the quality of eriss monitoring programs is consistent with best practice.

STRATEGIC PLANNING

Introduction

Barry Hart outlined the reasons behind the ARRTC strategic planning process and welcomed the *eriss* and EWLS staff that were present.

Ian Loftus gave a brief presentation on how the strategic planning process might proceed.

Members considered the summary of issues and research in the document 'Summary of ERISS Research' within the following framework:

- Surface Water;
- Groundwater;
- Atmospheric Dispersion;
- Rehabilitation; and
- Revegetation.

The meeting was then provided with background information, in response to specific queries, by staff from *eriss* and EWLS.

Closure Criteria

Discussion on closure criteria then took place. Tony Milnes advised the meeting that closure criteria is emerging as an important issue, and solicited members' views as to the processes that might be

used to develop criteria. He added that EWLS is in the process of developing a series of criteria for closure, with radiological, geomorphic, geotechnical and target ecosystems all being issues.

There was particular discussion on:

- The essential requirement that scientific models be credible;
- The need to benchmark the surrounding region, although there is potential for this to be interpreted in a variety of ways;
- The possibility of taking a limited number of parameters and looking at the science behind the compliance values for them, noting that the Environmental Requirements provided broadly defined criteria, but these needed to be divided into specific criteria with specifications/numbers for each criterion;
- Stakeholder communications, and the need to include all stakeholders in the loop; and
- The process for development of the landform, which requires the development of workable closure criteria.

These issues are being considered during development of final landform - will eventually need a set of workable closure criteria

Outcome/Action: ARRTC members agreed that closure criteria would be discussed at the next meeting, with a concept paper (looking at the broad parameters) being provided to that meeting.

Feedback

There was general discussion on strategic planning issues following the meeting of independent scientific members on Wednesday morning.

A list of outcomes (see Appendix B, 'Key Knowledge Needs') was tabled by Barry Hart and discussed by members. The document focuses on the key objective, which is to protect the Alligator Rivers Region.

There was then some discussion on the tabled list, with particular issues raised including:

- Arthur Johnston indicated his preference for a plan to be in place as soon as possible in order to inform the *eriss* research program for 2003-04;
- The need to look at Strategic Planning in the context of the Environmental Requirements;
- The view that independent members should take a greater level of involvement in the ongoing strategic planning process, identifying priorities and identifying knowledge gaps; and
- The uncertainty of the future, which is potentially influenced by factors such as changes to pit design, mining of waste rock, changes in the price of uranium, and increasing efficiency of mining operations.

Outcome/Action: Barry Hart, in consultation with independent scientific members, to expand and further develop the tabled list of outcomes to include a more detailed level of questions for response by eriss and EWLS. This process will be conducted out of session via e-mail.

MONITORING

➤ **Updates to Monitoring Programs**

Alex Zapantis provided an update on the Supervising Scientist's monitoring program, including updated wet season data, and some measurements showing dilution and/or attenuation of uranium in the Gulungul creek catchment.

There was then some discussion about these measurements, particularly in relation to statistical rigour of the investigation and the conclusions that may or may not be drawn from it.

➤ **Radiological Monitoring**

Barry Hart advised that the Environmental Research Institute of the Supervising Scientist has prepared a paper on the Supervising Scientist radiological monitoring program, and that ERA radiological monitoring programs are currently being reviewed.

He suggested that discussion of radiological monitoring be deferred to the next ARRTC meeting to allow consideration of all issues.

Supervising Scientist's Radiological Monitoring Program

Paul Martin spoke to the paper 'SSD radiological Monitoring and Assessment Program', and there was then general discussion on radiological monitoring issues, including specific discussion on:

- The use of airborne gamma surveying and radio metrics;
- Issues associated with overnight build-up of radon;
- The recognised standards for analysing and interpreting data, which are produced by the International Commission on Radiation Protection (ICRP) and the International Atomic Energy Agency (IAEA);
- The possibility of getting a statistician to review statistical data and sampling design;
- Whether the role of the monitoring – to provide public assurance – represented an efficient allocation of resources;
- Possible duplication between Supervising Scientist monitoring and ERA monitoring; and
- The issue of radionuclide uptake in bush foods in land application areas.

Outcome/Action: ARRTC asked for a single EWLS/eriss paper on radiological monitoring to be produced for the next ARRTC meeting.

ERA Radiological Monitoring

In the absence of a paper by ERA on its radiological monitoring program, Alex Zapantis gave a brief overview of the ERA radiological monitoring program. He talked about the aims of monitoring and the use of dose limits set by the International Commission on Radiation Protection (ICRP).

This was followed by discussion in the following issues:

- Tony McGill advised that ERA's radiological monitoring program would be audited by a "Radiological Management Review Team", later in 2003. Alex Zapantis advised that the group is meeting regularly.

- The issue of biased sampling in the monitoring program, which is an ERA program based on a risk management approach;
- The historical background of monitoring at Jabiru East; and
- The “wind sector methodology” which is used to distinguish between mine-related and background levels of radon.

ASSESSMENT AND OPERATIONAL MINING ISSUES

➤ **Jabiluka Water Management**

Ray Evans talk to his paper on the Jabiluka Water Management system. He advised that the paper was a further development of his understanding of the issues. EWLS and the Supervising Scientist have provided comments on the original document, and these comments are incorporated in the revised document that was provided to members prior to the meetings. Ray Evans thanked EWLS and the Supervising Scientist for their input.

ARRTC was asked to comment on the technical aspects that informed the decisions taken to approve the land application, via irrigation, of pond water at Jabiluka during the 2001 dry season.

Alex Zapantis advised that the Supervising Scientist’s position relied on the ANZECC water quality guidelines. He then explained some of the assumptions being used, and that the approach used was very conservative.

There was then some discussion on the merits of making the paper publicly available, possibly as an Internal Report (IR) of the Supervising Scientist or as an ARRTC occasional paper.

Outcome/Action: After consideration of information supplied ARRTC has concluded that:

- *The scientific analysis that informed the decision was appropriate;*
- *Two approaches were used to analyse the setting of load limits for major constituents and that this provided an increased level of confidence in the decision;*
- *The main approach used to inform the decision relied on a conservative dilution-based analysis. This was a simple but appropriate approach;*
- *ARRTC will pursue aspects of the conservative tracer model that remain unresolved but which did not affect the quality of the decision.*

➤ **Radiological Incident at Ranger**

Alex Zapantis gave a presentation on the radiological incident that occurred at Ranger during November 2002, and then responded to questions.

This was followed by discussion on radiological issues, with Tony McGill giving his views on the problems with the current method for the calculation of dose limits.

➤ **ERA Program**

Tony Milnes gave a presentation on the status of environmental issues for the Ranger and Jabiluka sites, including the need for a closure plan.

Alex Zapantis advised that he thought ERA milestones needed scientific rigour in terms of options

Discussed a range of options related to mine closure criteria milestones and assumptions, activities during operation, activities post-operations, latest whole-of-mine-life plan, recent applications,

negotiations and MTC technical discussions, key current projects, key issues, strategic issues in 2003 for both the Ranger and Jabiluka sites

GENERAL BUSINESS AND OTHER ISSUES

➤ **Communication with Traditional Owners**

Max Finlayson spoke to paper 'Communications with Traditional Owners', explaining that there was a recognition of the need for ongoing effort in the areas of communicating with Traditional Owners.

Peter Wellings noted a correction to Point 8 on the second page of the paper, advising that a NLC mining representative does not always attend meetings of the Kakadu Board of Management as it is the NLC Parks and Tourism officer who attends most meetings.

Barry Hart then spoke about the need for knowledge exchange between all stakeholders.

There was then discussion on the matter of communications. Issues raised included:

- The outcomes of the meeting with the Kakadu Board of Management in April;
- The website with monitoring data and other information, which does not suit all of the relevant stakeholders;
- The *eriss* newsletter, which is published regularly; and
- The difficulty of communicating directly with traditional owners, due to the presence of intermediaries who could make access and information flow difficult.

Outcome/Action: Members noted the need for effective communication with Traditional Owners and noted that it should be ongoing and meaningful.

➤ **ARRTC Business Plan**

Barry Hart advised that a focus on other ARRTC issues had meant that the Business Plan issue had not been progressed significantly.

Outcome/Action: Barry Hart and Ian Loftus to progress the Business Plan in the context of the strategic planning process.

➤ **NGO Representative on ARRTC**

Arthur Johnston advised the meeting on the status of attempts to get an environmental NGO representative for ARRTC. He advised that the Minister had sent several letters to the NGOs but had only received a single nomination from the NECF on behalf of the environmental NGOs. He advised that this response was not consistent with the Minister's request and that the matter was now with the Minister. .

Members discussed a suggestion that ARRTC could recommend a set of criteria to assist the Minister in considering nominations.

The possibility of having a social scientist as a NGO representative was raised, and this was followed by general discussion.

Outcome/Action: Barry Hart asked members to give consideration to the types of criteria that might be used by the Minister in selecting an environmental NGO representative..

➤ **Member Reports – Parks Australia North**

Peter Wellings advised that three separate issues would be addressed in the Parks update to members:

- General information update;
- South Alligator Valley; and
- Social impact monitoring and the Kakadu Regional Social Impact Study.

General Update from Parks Australia

Peter Wellings talked about:

- The Kakadu Plan of Management, which expires in March 2004, and the consultative processes associated with developing the next plan of management. He provided members with a print-out of website information on the Kakadu Plan of Management development process;
- A Periodic Report being prepared for the World Heritage Committee on the state of conservation of World Heritage properties (including Kakadu) in Australia. The submission is for consideration by the World Heritage Committee in June 2003 and is being prepared by the Heritage Management Branch of Environment Australia;
- Preliminary results of park-based research into the impact of cane toads on fauna (particularly small mammals such as native cats) in Kakadu National Park, advising that cane toads are expected to have a significant impact on the native cat population;
- Whether ARRTC wanted regular updates from Parks Australia on park-related research activities; and
- Work being undertaken by David Bowman from the Key Centre for Tropical Wildlife Management (KCTWM) at the NT University in relation to broad landscape change and past decadal scale temporal change over larger areas. He also mentioned the work on feral management control including the socio-economic and biological context of feral animal issues.

Outcome/Action: ARRTC would like an annual update, to be provided to the meeting held in September each year.

South Alligator Valley

Julian Barry gave a presentation on the South Alligator Valley rehabilitation and the role of Parks Australia North in the rehabilitation. This was followed by discussion on the following issues:

- The Radiological standards for Part A sites, which Alex Zapantis described;
- Barry Hart advised that yearly updates on the South Alligator Valley would be appropriate for ARRTC and Jill Fitch expressed interest in being kept up to date in relation to the rehabilitation issues.

Outcome/Action: Julian Barry to keep Jill Fitch informed on South Alligator Valley rehabilitation issues.

Social Research and Monitoring and the Kakadu Regional Social Impact Study

Peter Wellings talked about the previous ARRTC discussion on social impact research and the extent to which social impact research would be needed. Particular issues raised were:

- An update on the Kakadu Regional Social Impact Study. Peter advised that Parks Australia North is updating the KRSIS implementation activity report to bring the Commonwealth Environment Minister up to date on progress. He indicated that he had been holding recent discussions with the NLC about next steps on KRSIS-related activities, including monitoring;
- That issues related to governance and community fragmentation still exist;
- That ERA is funding a project officer in Jabiru to work with a recently established Jabiru Sustainability Working Group to work on futures in relation to the township of Jabiru, and that the Mirrar are engaged in this initiative. The Northern Land Council has also been involved in progressing recommendations of a Kakadu Region Economic Development Strategy, looking at local economic futures, especially non-mining futures; and
- Work on progressing and funding social impact monitoring.

Outcome/Action: The Chairman's letter to the Environment Minister will note some progress but concern over rate of progress in relation to social impact monitoring.

➤ **Member Reports – Supervising Scientist**

Arthur Johnston advised that he had nothing further to add.

➤ **Member Reports – Department of Business, Industry and Resource Development**

Tony McGill advised that he had nothing further to add.

➤ **Member Reports – Energy Resources of Australia**

Tony Milnes advised that he had nothing further to add.

➤ **Member Reports – Northern Land Council**

Mark Foy advised the meeting that negotiations in relation to Section 44 of the *Aboriginal Land Rights (Northern Territory) Act* had now resumed after being in abeyance for several years. He advised that the Mirrar people were now participating in the process. He then talked about the negotiating process.

He advised that the issue of Jabiru Airport was still under investigation, with consideration being given to abandoning and rebuilding at another location to overcome problems with the current alignment of the runway.

➤ **Member Reports – Pioneer International Ltd**

No report was given as Shane Maraldo was not present.

OTHER BUSINESS

➤ **References to Employers**

Carl Grant asked if nametags and labels could have employers' names removed as independent scientific ARRTC members do not represent their employer.

Outcome/Action: Ian Loftus to ensure that nametags and labels have only personal names and titles at the next meeting.

➤ **Role of ARRTC Members**

Carl Grant suggested that eriss and EWLS needed more guidance on what was being requested for ARRTC meetings, and that ARRTC members should work more closely with eriss and EWLS staff to ensure appropriate actions are undertaken. He also suggested that ARRTC member should take some responsibility for carriage of ARRTC-related matters.

➤ **Conduct of Meetings and Presence of Non-members**

Arthur Johnston raised the conduct of ARRTC meetings, advising that he felt that members could be more thoughtful when discussing issues in the presence of non-members such as eriss staff. He felt that the casual nature of ARRTC, which has resulted from the familiarity and rapport amongst members which has developed over last four meetings, can be intimidating to non-members who have not developed that rapport with members.

There was then some discussion on the presence of non-members at ARRTC meetings. Some specific issues raised included:

- Why outsiders needed to be present at ARRTC meetings;
- The relationship between ARRTC members and staff from *eriss*;
- The protocols that were developed at the first meeting of the reconstituted ARRTC; and
- The blurring of the distinction between the strategic planning workshops and ARRTC general business that resulted from the last-minute re-arranging of the agenda, resulting in the presence of *eriss* and EWLS staff for extended periods.

It was noted that ARRTC is not a board of management, and that it is not ARRTC's role to make management decisions in relation to *eriss*.

NEXT MEETING

There was discussion on the timing of the next ARRTC meeting. Barry Hart thought that sometime in September would be appropriate and would allow sufficient time to further progress strategic planning issues.

The target date for the next meeting is 15-17 September 2003, which will include a site visit to Nabarlek.

Outcome/Action: Members to confirm their availability for 15-17 September 2003.

Ray Evans raised the issue of ARRTC's increasing workload and the levels of remuneration paid to ARRTC members. He advised that the level of sitting fees paid to members was significantly less than the market rate for scientific consultants.

Outcome/Action: Arthur Johnston to consider remuneration and workload issues.

CLOSE

Barry Hart closed the meeting at 1710 on 19 February 2003 and thanked members and others for attending. He also thanked Ian Loftus for acting as meeting secretariat and extended particular thanks to Ann Thompson for her “behind the scenes” efforts in support of the meeting.

APPENDIX A – LIST OF DOCUMENTS TABLED AT MEETING AND/OR PROVIDED TO MEMBERS

Meeting Papers Provided via Secure Website

‘Draft Summary Record of 10th Meeting (September 2002)’

‘Progress Report on Stream Monitoring’

‘SSD Radiological monitoring and assessment program’

‘Conceptual model of ecosystem and pathways’

‘Ecological Risk Assessment and Ecosystem Models’

‘Ecotoxicity Testing’

‘Progress report on landscape-scale analyses of the ARR’

‘Remote Sensing and GIS activities in the SSD’

‘Sediment Modelling’

‘Communicating with Traditional Owners’

‘Hydrological Gauging Network’

Background Papers for Strategic Planning Provided via Secure Website

‘Ranger Environmental Requirements’

‘Summary of ERISS Research’

‘ERISS Strategic Plan February 2003’

‘Selected pages of Senate Inquiry Hansard - 30 Sept 2002’

‘Selected pages of Senate Inquiry Hansard - 1 Oct 2002’

‘Selected pages of Senate Inquiry Hansard - 24 Oct 2002’

Other Papers Provided via Secure Website

‘Jabiluka IWMP Discussion Response’

‘List Of ERA Environmental R&D Reports & Papers 2002-2003’

Other Information Published on Secure Website

Draft Supervising Scientist Report - Ecotoxicological testing protocols for assessment of risks and threats to tropical Australian wetlands

N Riethmuller, A Hogan, A Koch, C Turley & C Camilleri

Supervising Scientist Report 147 - Techniques for enhanced wetland inventory and monitoring

Finlayson CM & Spiers AG (Eds)

Published by Supervising Scientist

Date of publication 1999

ISBN 0642243506

Mining in the Alligator Rivers Region, northern Australia

Assessing potential and actual effects on ecosystem and human health

R.A. van Dam, C.L. Humphrey, P. Martin

(in press)

Documents Circulated via e-mail Prior to Meeting

List of *eriss* staff

Documents Tabled at Meeting

ERA List of Key Research and Development Projects (at meeting)

Information on Kakadu Plan of Management (taken from Parks Australia website)

APPENDIX B – KEY KNOWLEDGE NEEDS

Key Knowledge Needs

Objective: Protection of the ARR

Mine operations (“now”) within a risk framework

Reassess and quantify contaminant movement within biophysical pathways (concentration, species, loads, dynamics)

Contaminant movements through groundwater pathways from current operations

Linking ecotoxicological knowledge and biophysical pathways (first flush, terrestrial, food, sediments)

Human health risks associated with biophysical pathways (bush tucker, bioaccumulation, drinking water)

Radiological effects on people (source terms, dose assessment parameters, sampling and analysis)

Linking of conceptual models with onsite management (adaptive, not operationalising the science)

Mine Closure (“future”)

Completion criteria, shared reclamation objectives and indicators of success

Ecosystem establishment techniques (landform, vegetation, fauna, hydrology, geochemistry)

Sustainability of rehabilitation (weeds, fire, nutrients, resilience, extreme events)

Radon emanation and bioaccumulation of radionuclides from final landform

Adequate baseline data to underpin indicators of success (eg hydrology of Gulungul)

Demonstrated ability to reconstruct an ecosystem (Nabarlek)

Knowledge Management and Communication

Between and within research providers (past, present and into the future)

Uncertainty analysis of data (eg risk assessment) and communicating

Development of an integrated framework (landscape scale analysis)

Effective communication of science to stakeholders

APPENDIX B – LIST OF ACTION ITEMS ARISING FROM MEETING

Issue	Outcome/Action
Meeting arrangements	<i>Outcome/Action: Ian Loftus to talk to Mark Foy about alternative means of providing meeting papers.</i>
ARRTC processes	<i>Outcome/Action: Members need enough information to be informed that the science is sound.</i>
Nabarlek	<i>Outcome/Action: A site visit to Nabarlek will be scheduled for the next ARRTC meeting.</i>
Sediment modelling	<i>Outcome/Action: ARRTC members commented that they would like to see the model further developed/justified to address the type of changes that can be detected. ARRTC advised that it would be in a better position to comment once the model is further developed. It was suggested that a power analysis may be needed and/or the sensitivity of the model as a monitoring tool addressed.</i>
Conceptual ecosystem model	<i>Outcome/Action: Barry Hart indicated that the conceptual model would help facilitate the strategic planning process and should be developed further as project planning and implementation occurred.</i>
Ecotoxicology	<i>Outcome/Action: ARRTC noted that some ecotoxicological research was still occurring, although not a great deal, and that ecotoxicological issues should be addressed through the strategic planning process, and then considered as part of the overall priority list of actions.</i>
Hydrological gauging	<i>Outcome/Action: ARRTC noted that the nine current hydrological monitoring sites are essential, and requested an analysis of a broader network of gauging stations to assess issues that may arise. An assessment of additional needs to be undertaken by the next meeting of ARRTC, in the context of the strategic planning process and within the context of the data and information requirements to effectively measure hydrologic system performance during mine closure. Arthur Johnston would contact the DIPE and further discuss funding of the existing stream gauging network</i>
Ecological risk assessment	<i>Outcome/Action: ARRTC members supported the use of ecological risk assessment and ecosystem models as an approach, noting their usefulness in identifying risks and knowledge gaps, and helping communicating information, and where possible providing quantitative information for management decision making.</i>
Closure criteria	<i>Outcome/Action: ARRTC members agreed that closure criteria would be examined at the next meeting, with a discussion paper (looking at the broad parameters) being provided to that meeting.</i>
Key knowledge needs	<i>Outcome/Action: Barry Hart, in consultation with independent scientific members, to expand and further develop the tabled list of outcomes to include a more detailed level of questions for response by eriss and EWLS.</i>

	<i>This process will be conducted out of session via e-mail.</i>
Radiological monitoring	<i>Outcome/Action: ARRTC asked for a single EWLS/eriss paper on radiological monitoring to be produced for the next ARRTC meeting.</i>
Communication with Traditional Owners	<i>Outcome/Action: Members noted the need for ongoing communication with Traditional Owners and noted that it should be ongoing and meaningful.</i>
Business plan	<i>Outcome/Action: Barry Hart and Ian Loftus to progress the Business Plan in the context of the strategic planning process.</i>
NGO representative	<i>Outcome/Action: Barry Hart asked members to give consideration to the types of criteria that might be used by the Minister in selecting an environmental NGO representative.</i>
Park Australia updates	<i>Outcome/Action: ARRTC would like an annual update, to be provided to the meeting held in September each year.</i>
South Alligator Valley	<i>Outcome/Action: Julian Barry to keep Jill Fitch informed on South Alligator Valley rehabilitation issues.</i>
Social impact issues	<i>Outcome/Action: The Chairman's letter to the Environment Minister will note some progress but concern over rate of progress in relation to social impact monitoring.</i>
Meeting arrangements	<i>Outcome/Action: Ian Loftus to ensure that nametags and labels have only personal names and titles at the next meeting.</i>
Next meeting	<i>Outcome/Action: Members to confirm their availability for 15-17 September 2003.</i>
Members' remuneration	<i>Outcome/Action: Arthur Johnston to consider remuneration and workload issues.</i>