

SUPERVISING SCIENTIST'S OVERVIEW

As Supervising Scientist, I am responsible for the supervision, monitoring and audit of uranium mines in the Alligator Rivers Region as well as research into the possible impact of uranium mining on the environment of the region.

Energy Resources of Australia (ERA) operates the only active uranium mine in the Region, the Ranger mine, and currently operates the Jabiluka project on a care and maintenance basis. The Nabarlek mine was decommissioned in 1995 and the adequacy of the rehabilitation of this site is under ongoing assessment.

ERA achieved a number of significant outcomes in the environmental management of the Ranger mine during 2002–03. In particular, the quality of water entering Coonjimba Billabong and Corridor Creek has improved substantially. These improvements followed engineering works in the area to the north of the tailings dam in the catchment of Retention Pond 1 (RP1) and around the southern waste rock stockpile. As a result, the concentration of uranium in RP1 water during March 2003 was lower than the corresponding maximum value in the previous year by more than a factor of ten and the maximum concentration of uranium in waters entering the Corridor Creek wetland filter system was lower than the previous year's maximum by more than a factor of twenty.

Assessment of ERA's proposal to reduce the amount of process water at the Ranger site by the installation of a process water treatment plant continued during the year. Based on *eriss*'s ecotoxicological analysis of pilot plant effluent, it has been concluded that the relevant Commonwealth-State Ministerial Council recommendations for protecting ecosystems of high conservation value should easily be met under operational conditions and that ERA's proposal to pass the effluent from the plant through a wetland filter system would constitute a substantial additional environmental protection measure.

There were three reportable incidents at the Ranger mine during the year. In November 2002, a contracting company replaced the roof of the precipitator building which is located next to the calciner building in which the final product, uranium oxide, is produced in the Ranger Mill. During the second phase of the project, installation of the new roof, workers were inadvertently exposed to product dust from the calciner building due to a malfunction of the pressurisation system in the product packing area. ERA estimates of radiation exposure were thoroughly checked by *oss* staff and were found to be an overestimate. Subsequent measurement of the dose received by the most exposed individual revealed that the actual radiation dose was about half the original estimate and about one fifth of the maximum dose limit for workers in a single year. The fault in the pressurisation system was repaired by ERA. The other two incidents were minor and details are provided in the body of this report.

The second full year of the Supervising Scientist's routine environmental monitoring programme in the vicinity of the Ranger mine was completed during 2002–03 and monitoring data were updated weekly on the Supervising Scientist's website throughout the wet season. The chemical monitoring programme showed that, for most constituents and indicators, the quality of water in Magela Creek downstream from the mine was virtually indistinguishable from that of upstream water. For uranium and sulphate, there is a detectable mine signal but in all cases the quality of water in 2002–03 met the limits and guideline values recommended by the Supervising Scientist according to the ANZECC and

ARMCANZ water quality guidelines. Indeed, the measures taken by ERA to improve water quality in the RP1 and Corridor Creek systems led to an improvement in water quality in Magela Creek compared with that observed in previous recent wet seasons. In addition, the radiological and biological monitoring programmes did not detect any significant effect on people or ecosystems that could be attributed to operations of the Ranger mine.

Research at *eriss* into the possible ecotoxicological effects of magnesium sulphate continued during 2002–03. The results of single species laboratory based toxicity studies have now been augmented by field mesocosm experiments in which the effects on small aquatic animals are observed in circumstances similar to their natural environment. The field measurement programme is almost complete and the results obtained support the earlier conclusion that the salinity of waters leaving the Ranger mine is unlikely to be causing any harm to aquatic ecosystems of Magela Creek.

It was noted in last year's report that the Minister for the Environment and Heritage and the Minister for Industry, Tourism and Resources had requested that I investigate a number of allegations made by a former ERA employee about serious deficiencies in ERA's environmental management at the Ranger mine in the period 1996–1998. A detailed report on these issues was submitted to Ministers in September 2002. While it was difficult to come to firm conclusions on some issues after a lapse of some five years, the overall conclusion of the report was that most of the allegations were unfounded and that, in particular, no evidence was found that ERA had operated otherwise than in accordance with its Authorisation and the Commonwealth's Environmental Requirements. Two recommendations were made on water management issues and these have subsequently been implemented.

Jabiluka continued to operate on an environmental management and standby mode throughout 2002–03. The most significant issue related to operations at Jabiluka was the completion of the review of the water management system to develop a system that will be more appropriate for the period of 8–10 years that will elapse before any further development of the Jabiluka mine could occur. This delay has arisen from the commitment made by ERA to the World Heritage Committee that it would not develop Jabiluka to full production until operations at Ranger approach completion.

The outcome of the review by the Jabiluka Minesite Technical Committee was the conclusion that the system that constitutes Best Practicable Technology for the long term would be a passive system resulting from relocation of the mineralised stockpile underground to the mine decline, transfer of residual water from the Jabiluka water storage pond to the decline, transfer of the schist component of the waste rock dump to the decline and subsequent sealing of the decline. These primary measures would be accompanied by removal of surface infrastructure at the site, provision of an overflow system for the water storage pond and stabilisation of the site surface through limited revegetation measures. The MTC agreed to ERA's final proposal, which is also supported by the Mirrar Traditional Owners, at the end of June 2003 and Northern Territory Government approval is expected early in 2003–04.

Two relatively minor incidents occurred at Jabiluka during the year in which certain radiation measurements specified in the Authorisation were not carried out. In radiological protection terms, the omissions were not significant but the *OSS* brought the issue to the attention of ERA and the Northern Territory regulatory agency.

Management of the site during the late dry season of 2002 and the early dry season months of 2003 required the continued disposal of water from the Jabiluka water storage pond by irrigation on disturbed land at the Jabiluka site. The Supervising Scientist's routine monitoring programme for the Jabiluka site during 2002–03 demonstrated that the quality of water entering Kakadu National Park from the site is extremely good. For example, no change in uranium concentrations from historical values can be detected and maximum uranium concentrations remain lower than the recommended limit by more than a factor of 200. Similarly, the radiological and biological monitoring programmes did not detect any significant effect on people or ecosystems that could be attributed to operations at the Jabiluka site.

Thus, an important outcome of the research and monitoring activities of the Supervising Scientist during 2002–03 is that I can, with considerable confidence, provide an assurance to the Australian community that the operations of ERA at Ranger and Jabiluka have not led to any harm to the people or ecosystems of Kakadu National Park.

Assessment of the adequacy of decommissioning and rehabilitation of the Nabarlek mine site continued throughout 2002–03. The draft final report on the Indicators of Ecosystem Success project was received in May 2003. These results, together with results of *eriss* projects on the site vegetation surveys, erosional status of the site, radiological status of the site and the development of remote sensing monitoring methods, will be used by the Nabarlek MTC to develop a final rehabilitation strategy for the site in 2003–04.

The Alligator Rivers Region Technical Committee (ARRTC) met twice during 2002–03. Major topics addressed by ARRTC included the adequacy of the current monitoring programmes as a basis for the provision of assurances to the Australian community and the future research needs in the region. On monitoring, ARRTC concluded that the biological monitoring programme being carried out by the Supervising Scientist constitutes national and international best practice. Further, it concluded that, if the Supervising Scientist's routine monitoring programme is effectively implemented and no statistically significant effects are observed in the programme, ARRTC members would support the conclusion that the downstream aquatic ecosystems of Kakadu National Park would have been protected. On research, ARRTC has now reviewed environmental protection issues arising from mining in the region and past research on these issues and has, as a result, developed what it sees as Key Knowledge Needs. At the first meeting of ARRTC in 2003–04, *eriss* will present to ARRTC members a restructure of its research programme in response to these needs.

During July and August 2002, staff of the Office of the Supervising Scientist, the Environmental Research Institute of the Supervising Scientist and Parks Australia North moved into the new Department of the Environment and Heritage building and laboratory facilities in Darwin. The Jabiru Field Station of the Supervising Scientist was established at the previous *eriss* site in Jabiru. The new facilities in Darwin were officially opened by the Hon Dr Sharman Stone MP, Parliamentary Secretary to the Minister for the Environment and Heritage, on 24 November 2002. I would like to express my gratitude to all staff for the way in which they established their work programmes in the new facilities so quickly and effectively so that we were able to deliver our programme outcomes almost without interruption.

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Supervising Scientist