

RAMSAR CONVENTION MONITORING PROCEDURE

REPORT NO. 28 [now numbered as 29]

ST. LUCIA SYSTEM. SOUTH AFRICA

General Introduction

1. Each Contracting Party to the Ramsar Convention (“Convention on Wetlands of International Importance especially as Waterfowl Habitat”, Ramsar, 1.971) “shall designate suitable wetlands within its territory for inclusion in a List of Wetlands of International Importance” (Article 2.1 of the Convention). The Contracting Parties “shall designate at least one wetland to be included in the List” (Article 2.4) and “shall formulate and implement their planning so as to promote the conservation of the wetlands included in the List” (Article 3.1). Furthermore, each Contracting Party, “shall arrange to be informed at the earliest possible time if the ecological character of any wetland in its territory and included in the list has changed, is changing or is likely to change as the result of technological developments, pollution or other human interference. Information on such changes shall be passed without delay to the organization or government responsible for continuing bureau duties” (Article 3.2).
2. These are the principal stipulations of the Convention concerning wetlands included in the Ramsar List. Successive meetings of the Conference of the Contracting Parties (held in 1980 at Cagliari, Italy, in 1984 at Groningen, Netherlands and in 1987 at Regina, Canada) have devoted special attention to the conservation of listed wetlands and to the best ways of avoiding ‘change in ecological character’.
3. Conference Document C.3.6 of the Regina meeting (“Review of national reports submitted by Contracting Parties and Review of implementation of the Convention since the second meeting in Groningen, Netherlands in May 1984”) included a section (paragraphs 66 to 107) entitled “Changes in the ecological character of listed wetlands”. This section recalls that it is “essential that, after a wetland has been designated for the List, its conservation status should be maintained”, and that “the concept of preventing ‘change in the ecological character’ is fundamental to the Ramsar Convention”. Paragraphs 74 to 107 then review the various wetlands on the List where such changes have occurred, are occurring, or are likely to occur.
4. During the discussion of these paragraphs, several delegates emphasized the importance of avoiding changes of this kind in listed wetlands and the Conference approved a Recommendation (C .3.9) on this matter. The Recommendation (text attached to the present document) urges Contracting Parties to take swift and effective action to prevent any further degradation of sites and to restore, as far as possible, the value of degraded sites; the Recommendation requests Contracting Parties in whose territory are located the sites identified in Conference Document C.3.6 as having incurred or being threatened by damage, to report to the Convention Bureau the actions undertaken to safeguard these sites.

5. At the fourth Meeting of the Ramsar Convention Standing Committee, the members (Pakistan, Canada, Chile, Netherlands, Poland, Switzerland, Tunisia and USA) and observers (United Kingdom, IUCN, IWRB and WWF) considered the best way of promoting the implementation of Recommendation 3.9. A “Monitoring Procedure” was adopted by the Standing Committee to enable the Ramsar Bureau to work with the Contracting Party (or Parties) concerned, in order to find a solution to possible change in ecological character at Ramsar sites; this procedure has been used since February 1988 by the Bureau. At Montreux in 1990, the Conference approved Recommendation 4.7 which “endorses the measures taken by the Standing Committee to establish a Ramsar Monitoring Procedure”; a number of amendments were made to the text of the Procedure; the revised text is appended to the present report (Appendix I). Recommendation 4.7 also “instructs the Bureau to continue to operate this procedure when it receives information on adverse or likely adverse changes in ecological character at Ramsar sites”. Recommendation 4.7 finally determines that Monitoring Procedure reports shall be public documents once the Contracting Party concerned has had an opportunity to study the reports and comment on them”.
6. The Montreux meeting also approved Recommendation 4.8 on “Change in ecological character of Ramsar sites”. This recommendation referred back to Regina document C.3.6 and to the similar document presented at Montreux (document INF. C.4.18) which, in its paragraph 224, lists 44 Ramsar sites in 23 countries which appear to have undergone, to be undergoing or to be likely to undergo change in ecological character. Recommendation 4.8 requests the Contracting Parties concerned to take swift and effective action to prevent or remedy such changes; it instructs the Bureau to maintain a Record of such sites and to give priority to application of the Monitoring Procedure at sites included in this Record.
7. Funding for the Monitoring Procedure is provided from the Convention’s core budget and also from additional voluntary contributions made by Contracting Parties (notably UK and USA), Unesco and interested non-government organizations, notably WWF and RSPB (the Royal Society for Protection of Birds, UK).

Implementation of the Ramsar Convention in South Africa - general

8. South Africa deposited its instrument of accession to the Ramsar Convention with Unesco on 12 March 1975, and was thus one of the original seven Contracting Parties which brought the Convention into force on 21 December 1975. At the time of accession, two wetlands (De Hoop Vlei and Barberspan) were designated for the List of wetlands of international importance; ten additional wetlands have subsequently been designated on three occasions: four (De Mond - Heuningnes Estuary; Blesbokspruit; Turtle Beaches/Coral Reefs of Tongaland; and St. Lucia System) on 2 December 1986; one (Langebaan) on 25 April 1988; and five (Wilderness Lakes; Verlorenvlei; Orange River Mouth; Kosi Bay; and Lake Sibaya) on 28 June 1991. In all therefore South Africa has designated 12 sites, covering 228,344 hectares, for the Ramsar List.

9. South Africa accepted the Paris Protocol and the Regina amendments (which amend the original Convention text) respectively on 25 May 1983 and 14 February 1992. South African delegations have taken part in all four of the meetings of the Conference of the Contracting Parties mentioned in paragraph 2 above, and South African government representatives have attended meetings of the Standing Committee as observers. South Africa has made annual financial contributions to the budget of the Convention since such contributions were instituted in 1988. A South African National Ramsar Committee has recently been established, and a national Ramsar “Newsletter” has been produced.

Possible change of ecological character at the St. Lucia System Ramsar site

10. As indicated in paragraph 1 above, Article 3.2 of the Convention stipulates that Contracting Parties shall inform the Bureau of actual or potential changes of ecological character at Ramsar sites. South Africa fulfilled this obligation through paragraph 2.3 of its national report to the 1990 Montreux Conference, which read as follows:

“The ecological character of two of South Africa’s listed wetlands is likely to change due to human interference. An application for an open cast dune mining operation is being considered by the South African Department of Mineral and Energy Affairs. The dunes to be mined are the coastal dunes which form the interface between the St. Lucia System and the Turtle Beaches & Coral Reefs of Tongaland. Besides the destruction of the biotic environment which will take place in the immediate area of mining, possible major impacts will be made on the ground-water hydrology which will adversely affect a far greater area of the wetlands than just the mine. The impacts of the necessary infrastructure for the mine might also be considerable.”

(Note: it was later explained that the Turtle Beaches & Coral Reefs of Tongaland would not be affected by the mining, since offshore currents would carry any spoil or debris out to sea, clear of the reefs).

11. As a result of this formal statement by the South African government, the St. Lucia System Ramsar site was included in the Montreux Record (the register of sites, established by Montreux Recommendation 4.8, where a change in ecological character has occurred, is occurring or is likely to occur - see paragraph 6 above). The same recommendation instructed the Convention Bureau to give priority to application of the Ramsar Monitoring Procedure at sites in the Montreux Record.
12. Furthermore, Montreux Recommendation 4.9 (which presents the Montreux Conference’s conclusions on particular Ramsar sites in the territories of a number of Contracting Parties) referred to St Lucia in the following terms:

“EXPRESSING CONCERN at the statements made at the Conference or in their national reports about change in ecological character in listed wetlands in their territories by the delegations of the Federal Republic of Germany, Greece, Iceland,

the Islamic Republic of Iran, Jordan, South Africa, Spain and the USA;

The Conference of the Contracting Parties

EXPRESSES its grave concern at the potential impact on the South African Ramsar site of St Lucia of mining for titanium and other heavy metals, and calls upon the South African Government:

- (a) to prohibit any mining activity which will damage the ecological character of the site; and
- (b) to ensure the St. Lucia system is retained as a protected site because of its national and international conservation importance”.

(The other sections of Recommendation 4.9 included similar expressions of concern about other Ramsar sites in Germany, Greece, Iceland, the Islamic Republic of Iran, Jordan, Spain and the USA).

13. In the light of these two conference recommendations and of subsequent reports from a number of bodies interested in St Lucia (in particular a report from the International Waterfowl and Wetlands Research Bureau), the Ramsar Bureau wrote to Adv. L. A. Pienaar, the South African Minister of National Education and Environment Affairs, in November 1991, suggesting that it might be appropriate to operate the Monitoring Procedure at St. Lucia. The Minister duly indicated that he had no objection to application of the Monitoring Procedure and the mission was organized in April-May 1992 with the personnel, terms of reference and programme set out in Appendix II.

St. Lucia System Ramsar site - general description

14. The St. Lucia System was designated by South Africa for the Ramsar List on 2 December 1986. The choice of the name St. Lucia “System” reflects the variety of this large wetland complex of 155,500 hectares, comprising several different wetland ecosystems (marine; forest, grassland and wetland mosaic of the Eastern Shores; Lake St. Lucia and the estuary; Mkuze [Mfolozi?] swamps and the dry savanna and thornveld of the Western Shores). The term “system” also reflects the variety of protected areas included - St. Lucia Game Reserve, St. Lucia Park, False Bay Park, Sodwana National Park, the Cape Vidal State Forest and several other linking sectors. The mission heard repeated references to the “Greater St. Lucia Wetland Park”, though the legal relevance of this term was not clear.
15. The St. Lucia System is part of a larger coastal lowland extending into Mozambique, east of the Lebombo mountains. This plain of Cainozoic sand, mainly of Pleistocene age, has been tectonically active during the Cainozoic, and as recently as the Quaternary. During the Holocene, Pleistocene sands have been reworked into shore-parallel, high-relief dune barriers, some of which have barred the drainage systems, forming lakes and semi-barred estuaries. Thus, the coastal plain is mainly an undulating sandy area with associated

wetland basins, various river systems and their floodplains, and towards the modern coast, estuaries, barred lagoons, and a ubiquitous dune barrier.

16. Several large-scale natural zones comprise the St. Lucia System and contribute to the distinct components of this regional system: (a) Lake St. Lucia estuarine system itself, comprised of limnetic, littoral and supratidal shore zones, complexes of internal structures such as shoals, sills and bars, and the Eastern Shore wetlands; (b) the barrier dune system; (c) the western shore zone; and (d) the feeder river systems.
17. Lake St. Lucia, some 300km² in area and very shallow, is a barred estuary, separated from the Indian Ocean by a high relief dune barrier, and is linked to the sea by a long narrow channel. Four sources of water recharge the estuary: (a) seawater via a narrow sea-linked channel; (b) riverine water that floods the estuary, or filters through swamps upstream; (c) freshwater from groundwater seepage from the barrier dune; and (d) rainfall.
18. Following the field investigations, this report concludes that the Eastern Shores (i.e., the undulating plain and the contained wetland basin) are part of the estuary system and not a landform that is a displaced unrelated adjunct to the estuary. From another perspective, if Lake St. Lucia is to be preserved as a holistic system for future study of estuarine processes, geomorphology, stratigraphy and Quaternary history, then the Eastern Shore must be included into the total picture of that system.
19. The literature suggests that the following sequence underlies the barrier: Holocene dune sand, which overlies Pleistocene sand, which overlies Pleistocene limestone (beach to dune deposits), which overlies Pleistocene Durnford Formation. This sequence may be revised when in situ (intact) cores are obtained from the barrier, when the pedogenetic-diagenetic alteration processes are separated from the sedimentological sequences, and when the various stratigraphical components of the dune barrier are dated. At this stage the stratigraphy of the dune barrier must remain unresolved.
20. The native vegetation on the barrier dunes is structurally rich and varied. There are developed dune forests, dune thickets, dune woodlands and dune scrub.
21. One of the most important aspects of the Lake St. Lucia area is the hydrology, whose functioning determines many aspects of wetland ecology, forest ecology, and beach shore face dynamics. The hydrological model within the barrier dunes is of a groundwater mound (phreatic zone), with an unsaturated (vadose) zone between the water table and the surface. Groundwater is recharged by rainfall, and losses occur due to evapotranspiration and discharges to estuary and sea by seepage.
22. Numerous descriptions of the St. Lucia System are available (e.g., in “Studies on the Ecology of Maputaland” eds. M.N. Bruton and K.H. Cooper; “The Greater St. Lucia Wetland Park” by R. Taylor; the Ramsar “Directory of Wetlands of International Importance”; or the IUCN “Directory of African Wetlands”).

23. In addition, three reports produced as part of the current Environmental Impact Assessment (EIA) process and critical to the Ramsar mission were reviewed by members of the Ramsar mission, those on “Landform Geomorphology and Geology”, on “Hydrology” and on “Wetlands”. (The basic scientific conclusions of the Ramsar mission are contained in the body of the present report; the detailed scientific assessment is given in full in Appendix IV). The geology and landforms in this area are the fundamental units upon which other studies such as hydrology, soils and vegetation are based, and so it is important to have the basic earth science component well documented. In this regard the report on landforms and geology is generally inadequate for obtaining the necessary information for assessment purposes. It is imperative that a scientifically sound stratigraphical framework be established for realistic assessment of many features of this environment, and as a basis for interpreting the hydrology. The Hydrology report, overall, given a variety of constraints in the study, is excellent and scholarly in its treatment of the macro-scale hydrology. With regard to the chapter on wetlands, there are two main criticisms: there is no description of soils and stratigraphy in the wetlands, and there is no information on the survival of plants in response to various periods of inundation and waterlogging. Both types of description are needed to make a realistic assessment of the effects of waterlogging and/or inundation in the area.

International importance of the St. Lucia System

24. The undoubted international importance of the St. Lucia System, and the reasons for its inclusion in the Ramsar List should be emphasized. The Ramsar “Criteria for identifying wetlands of international importance”, approved at Montreux, include three headings:
- representative or unique wetlands;
 - general criteria based on plants or animals; and
 - specific criteria based on waterfowl.

It is clear that the St. Lucia System is one of the few Ramsar sites anywhere in the world which meets all three groups of criteria.

25. In the representative or unique category, St. Lucia is, in different documents, variously called the “largest estuarine system on the African continent”, “the largest estuarine system in southern Africa” or “largest estuarine system in South Africa”. Whether or not it is really the largest in Africa would depend on the definition of “estuarine system”, but there is no doubt whatsoever that its estuarine sector is representative of the major estuarine systems of the continent and is one of the best conserved examples. Equally, the extensive dune forest must be regarded as a unique feature, and one which has perhaps not been given sufficient emphasis in the past; there can be few coastal forested dunes anywhere in the world where the trees grow so high, cover such a large area and exhibit such variety. It must also be emphasized that the dunes of the Eastern Shores and their covering of trees form an integral part of the wetland system, playing an essential role in the hydrological balance of the whole system (see paragraph 18). This point was emphasized in the so-called “Kriel” report of 1966, an extensive study carried out at a time of drought. It is

therefore surprising to read in the key issue report on Ramsar prepared as part of the EIA process that “the 1436 ha including infrastructure of the proposed mine path is located on dry land on top of the sand dunes and so cannot be defined as wetland within the Ramsar or any other definition”. The Ramsar List includes a large number of coastal wetlands and their constituent sand-dunes designated by other Contracting Parties.

26. In terms of general criteria based on plants or animals, the St. Lucia System scores heavily again. Plant communities of special interest include the dune forests already mentioned, the hygrophilous grasslands on the Eastern Shores, and the swamp forest communities of *Barringtonia racemosa* and *Ficus* spp. St. Lucia has the highest populations of Hippopotamus *Hippopotamus amphibius* and Nile crocodile *Crocodylus niloticus* in South Africa.
27. From the point of view of waterfowl, there are internationally important breeding concentrations of Pink-backed Pelican *Pelecanus rufescens* and White Pelican *Pelecanus onocrotalus*, and Goliath Heron *Ardea goliath*, Yellow-billed Stork *Mycteria ibis*, African Fish Eagle *Haliaeetus vocifer*, Red-winged Pratincole *Glareola oratincola* and Caspian Tern *Hydroprogne caspia*. Flamingos *Phoenicopterus ruber* have occasionally bred, and feed in large numbers (up to 40,000 individuals), while over 350 bird species have been recorded in the area.

Possible change of ecological character at the St. Lucia System Ramsar site [bis]

28. As indicated in the South African national report to the Montreux Conference, an application for an open cast dune mining operation is being considered by the South African Department of Mineral and Energy Affairs. Officials of this Department who attended the sessions at St. Lucia on 30 April explained to the mission that the mining rights cover some 3,400 hectares of land, were granted in 1975 (i.e., before the designation of St. Lucia as a Ramsar site) and are valid in terms of section 44 (1) (a) of the new Minerals Act of 1991. Prospecting operations conducted on the prospecting area over a number of years indicated the occurrence of heavy metals in workable quantities, which led to the application to exercise mining rights made in 1989.
29. The mining rights are held by Richards Bay Minerals (RBM), a company which already extracts mineral ores (used in the production of ilmenite, rutile and zircon) in open cast mining operations in the dune system at Richards Bay, south of St. Lucia and south of the Ramsar site. The ore is smelted in a major processing complex at the nearby city of Richards Bay. The mission had extensive contacts with officials of the mining company (both on the spot and in Pretoria) who went to great lengths to explain the company's operations. For the purposes of the present report, it does not appear necessary to go in detail into the technical and commercial aspects of the mining operation. Ore in the existing mining concession will, according to RBM, soon run out; in order to maintain the plant and to guarantee the considerable number of jobs it provides, RBM have applied to exercise its mining rights in the dunes of the Eastern Shores.

30. The process of open cast mining involves removal of vegetation on the top of the dunes and excavation of a large hole (up to 70 metres deep) which is filled with water to facilitate removal of the ore-bearing sand. Once the ore has been filtered from the sand, the topsoil and 95% of the sand is returned, the hole filled and the whole process moves forward. This process clearly disturbs the both dune vegetation and the original structure of the dunes. At the site of its current mining operation at Richards Bay, RBM is engaged in a project aimed at restoring dune vegetation, which involves replanting vegetation on the reconstituted dunes. In the area where this project has been going on for the longest period (15 years), acacia *Acacia karoo* scrub has been established. While it does provide vegetation cover, the acacia scrub is considerably poorer than the original flora.

The current Environmental Impact Assessment (EIA)

31. The application to exercise mining rights in such a well-known site as St. Lucia (Africa's oldest game reserve, established nearly a hundred years ago) raised considerable opposition among environmentalists. The fact that the system had been designated by the South African government as a Ramsar site meant that there were also international implications. Plans were therefore made by RBM to carry out an environmental impact assessment. Following reactions, notably from some non-governmental organizations, that an impact assessment financed by the company would lack objectivity, the South African government took a larger part in the EIA. The EIA is now producing some 23 "key issue reports" (including the three on landforms, hydrology and wetlands mentioned in paragraph 23, and the one on Ramsar mentioned in paragraph 25); these are open for comment by over 100 "Interested and Affected Parties" (many of them NGOs). The Ramsar mission had considerable exposure to the participants in the EIA; there will be considerable public scrutiny of the underlying documentation before it goes to the independent Review Panel who will make recommendations to Cabinet. The Cabinet is expected to take a decision on the granting of permission to mine early [late] in 1993.
32. Despite these elaborate arrangements to ensure the objectivity of the environmental impact assessment process, many of the NGOs who addressed the members of the Ramsar mission at St. Lucia on 30 April retained considerable doubts about EIA's objectivity. The mission, after meeting many of those involved in drawing up the reports, as well as four of the five members of the Review Panel, are convinced of the fairness of the process and of the independence of the individuals concerned. Nevertheless, it would appear important for future operations of this kind that the process should be (and should be seen to be) official and financed from official sources from the outset.
33. Given the very broad nature of the official South African EIA, the Ramsar Convention is anxious to emphasize that its own mission in no way seeks to pre-empt or supplant the national process. The present report is intended to provide further input for the consideration of the South African decision makers, to offer some thoughts from an international perspective, and to suggest how comparable situations have been dealt with in other states that are Contracting Parties to the Ramsar Convention.

Reactions of the Ramsar mission

34. **Should the application to mine be refused on principle?** There is no doubt of the international importance of the St. Lucia System, nor of its fitness to be included on the Ramsar List. As a result, one approach widely suggested to the mission was that no mining in the reserved area should be countenanced. The mission was sensitive to this approach and feels that this is the first issue to be considered by the South African authorities. In reaching this decision, the authorities will need to recall South Africa's obligations under the Ramsar Convention: while a designated site may be deleted from the List, this can only be done "in the urgent national interest", and if a site is deleted, then the Contracting Party concerned "should as far as possible compensate for any loss of wetland resources and in particular it should create additional nature reserves for waterfowl and for the protection, either in the same area or elsewhere, of an adequate portion of the original habitat" (Article 4.2). Compensation of this kind will be difficult at such an unusual site as St. Lucia. It should also be borne in mind that hitherto, no country has ever deleted a wetland from the List, though there are examples of restrictions of boundaries and of consequent listing of other areas in compensation.
35. **Alternate ore sources.** If potentially damaging mining is to be permitted in a Ramsar site, it must be clearly established that the mining really is in the urgent national interest. RBM have mining rights in the St. Lucia area which are close to their existing plant and could be exploited with minimal extra transport costs; they state that they currently have no other rights over reserves of remotely comparable value. Yet the decision of the South African government must be taken in the light of national interests (which include maintaining the integrity of the Ramsar site) and not simply in the interests of one mining company. Are there no other ore deposits in South Africa which could be made available to RBM? (RBM's exploitation maintains that none have been found). Or are there no possibilities of importing ore from elsewhere? (The port of Richards Bay is well equipped to import unprocessed ore). If production of these heavy metals is in the national interest, can they be produced by any other company?
36. **Environmental cost/benefit analysis of the mining operation.** RBM is a successful and profitable commercial company, which obviously needs to show a profit on its operations. The Ramsar mission had no reason to suggest that the mining operation was anything other than profitable in classical accounting terms. However, there is an international trend towards conducting environmental cost/benefit analyses of major projects; such analyses look at the overall costs of such projects, including the provision of subsidies for infrastructure, roads, ports, or the provision to the company of tax benefits. The Ramsar mission suggests that, if such an analysis has not already been carried out, it should be done.
37. In some quarters it was suggested that, since the granting of mining rights had pre-dated Ramsar listing, the mining option took precedence over considerations of conservation and wise use of wetlands. The mission felt that the order of decisions was not relevant: there are many instances of governments changing their minds and policies in the light of

changing circumstances and perceptions. Furthermore, inclusion of the St. Lucia System on the Ramsar List represents an international legal obligation, to which South Africa had not previously subscribed.

38. It was made very clear to members of the Ramsar mission that only two forms of land use are under discussion for the St. Lucia System: either immediate ecotourism; or, if the decision is made to allow open cast mining, mining followed by restoration and ecotourism. In the event that the South African authorities decide the mining option should be seriously considered, the Ramsar mission suggests that the following factors need to be taken into account before any decision to allow mining is made:
- approaches adopted in other Ramsar Contracting Parties
 - aspects where the proposed mining would have a critical impact on the conservation of the St. Lucia System;
 - the difficulties of restoration, in particular of dune stratigraphy and vegetation cover;
 - the effects on ecotourism in the short and long term;
 - the possible need to delete at least part of the site and to list other areas in compensation;
 - possible changes in land-use in the light of changing policies in South Africa.
39. **Approaches adopted in other Ramsar Contracting Parties: (a) Doñana, Spain.** Faced by the need to encourage local employment in the area round the Doñana National Park (also the subject of Montreux Recommendation 4.9), the Andalucian authorities established a special commission to advise on “Strategies for sustainable socio-economic development of the region round Doñana”. This commission, after a year’s deliberation, recommended that the development of the Doñana region be based on the region’s own special image with emphasis on value-added ecotourism, local produce, development of a local entrepreneurial culture through special training courses and a programme of public works; the clear implication was that the proposed massive tourist complex and extension of irrigated agriculture should not go ahead.
40. **Approaches adopted in other Ramsar Contracting Parties: (b) Wadden Sea. Denmark. Germany and Netherlands.** The sixth Trilateral Conference on the Wadden Sea in November 1991 adopted “Common Principles” for the conservation and wise use of this Ramsar site, an area with considerable economic and tourist impact, as follows:
- The guiding principle of the trilateral Wadden Sea policy is to achieve, as far as possible, a natural and sustainable ecosystem in which natural processes proceed in an undisturbed way.
 - This principle aims at
 - (i) maintaining the water movements and the attendant geomorphological and pedological processes;

- (ii) improving the quality of water, sediment and air to levels that are not harmful for the ecosystem;
 - (iii) safeguarding and optimizing the conditions for flora and fauna including
 - preservation of the Wadden Sea as a nursery area for North Sea fish;
 - conservation of the feeding, breeding, moulting and roosting areas of birds, and the birth and resting areas of seals as well as the prevention of disturbance in these areas;
 - conservation of the salt marshes and dunes;
 - (iv) maintaining the scenic qualities of the landscape, in particular the variety of landscape types and the specific features of the wide, open scenery including the perception of nature and landscape.
- The common policies as laid down in the “Joint Declaration of the Protection of the Wadden Sea from 1982” will be further implemented based on:
- the Principle of Careful Decision Making;
 - the Principle of Avoidance;
 - the Precautionary Principle;
 - the Principle of Translocation;
 - the Principle of Compensation;
 - the Principle of Restoration;
 - the Principles of Best Available Technology and Best Environmental Practice.

The report of the sixth Triennial Governmental Wadden Sea Conference provides further information on these principles.

41. **Approaches adopted in other Ramsar Contracting Parties: (c) Nakuru, Kenya.**
 Following the Ramsar report on Lake Nakuru, an action plan was formulated to counter possible effects of sewage flow into the lake. The action plan took the form of a project to expand the Nakuru Town Sewage Treatment Works. The Greater Nakuru Water Supply Project was scaled down to supply potable water at the rate of 13,300m³ per day. Phase II of the water supply project was discontinued in order to protect the large population of the Lesser Flamingo *Phoenicoparrus minor* which at times exceeds a million individuals in the lake.
42. The Ramsar mission suggests that the South African authorities, as well as carrying out the present thorough EIA, should establish mechanisms for reviewing the sustainable socio-economic development of the whole St Lucia area and its surroundings, along the lines indicated in paragraphs 39 to 41 above.
43. **Aspects where the proposed mining would have a critical impact on the Ramsar site.**
 The proposed mining would have a critical impact on the following aspects of the

conservation of the St. Lucia System Ramsar site:

- (a) dune landforms;
- (b) dune stratigraphy;
- (c) soil structure;
- (d) hydrological system;
- (e) beach and dune erosion; and
- (f) wetlands of the Eastern Shores.

44. **(a) Dune landforms:** Mining would result in the alteration of landscape, soils and stratigraphy. With excavation, creation of ponds, slurries, and creation of sand hills (the reconstituted land surface), there would be major disruption of the natural system of the barrier dunes of the St. Lucia System. After mining, the variety of landscape and soils and the variable dynamics of hydrology would be reduced, and the result would be a reduction in the richness of vegetation.
45. **(b) Dune stratigraphy:** The Quaternary Dune stratigraphy under the barrier is complex in the sense of small-scale variability within a few relatively simple litho-stratigraphical units. This variability, however, is to some extent a determinant of vegetation assemblage composition, in that chemistry; nutrient retention and water retention of soils and lithological units influence what species can survive or what species become dominant in given habitats. Mining homogenizes the stratigraphy, and through the settling of fine sediments to the floor of the mining pond, it creates a muddy layer. The final result is a sequence under the reconstituted “dunes” that is much more uniform than the original, with consequences for the variability of vegetation. Thus it is anticipated that homogenization of the stratigraphy would result in a decrease in the variability of plant species and a decrease in the heterogeneity of the micro-hydrological process. The dunes would also have a subsurface muddy layer, forming a discrete horizon.
46. **(c) Soil structure:** Soil, in the sense of a humus-rich sheet of material that cloaks the dune surface, and that has formed by biological, chemical and physical processes, is an important part of dune habitats. Soils evolve in time, and are linked to dune landscape, and hence influence vegetation. The mining operation would alter the soil characteristics of the area very significantly, which would result in major changes in habitat. It is therefore concluded that it will not be possible to reconstitute the original vegetation by rehabilitation measures.
47. **(d) Hydrological system:** The hydrological system is not well documented at the scale of micro-aquifers and preferential pathways, as they relate to complex buried hardpans, alluvial horizons, ferricrete or carbonate enriched zones, which is the scale at which water seeps into the edge of the modern estuary to influence vegetation and fauna. However, it is precisely at this scale that effects of hydrological alteration would be evident in areas distal from the mining operation. The homogenization of the stratigraphy would transform the hydrologic variability into a simple system and the various small-scale conduits, or preferred pathways in the system would be destroyed, with repercussions on the flora and

fauna of the wetlands of the Eastern Shores and the main estuary shore.

48. Other major impacts on the environment can also be expected in areas distal from the actual sand mining operation as a result of elevated water tables produced during mining. The elevated water table can be expected to affect the beaches and seaward face of the dunes of the barrier, and also the wetlands of the Eastern Shores.
49. **(e) Beach and dune erosion:** It has long been accepted that high groundwater tables under beaches result in beach erosion. The area of Lake Sibaya, on the coast immediately north of St. Lucia, rather than the Richards Bay area, provides an excellent model of the probable effect of a markedly elevated water table on the beach and dunes of the St. Lucia dune barrier. The Lake Sibaya model indicates that elevated water tables in the barrier dunes at St. Lucia can be expected to produce similar marked erosion. The stratigraphical system at Richards Bay, with the occurrence of the Durnford Formation at shallow depths, means that the model of hydrological effects of elevated water table in that area cannot be used as a model for the St. Lucia barrier.
50. **(f) Wetlands of the Eastern Shores:** The main effects of the mining operations on the wetlands of the Eastern Shores would be through elevated water levels. While this might have no discernible effect on the aquatic vegetation, or the more frequently inundated hygrophilous vegetation during the period that mining would produce elevated water tables in discrete fields, it cannot be stated definitively that such water table rises would not affect peripheral wetland vegetation and dune vegetation in low-lying areas. Experience shows that rising water levels kill strandline plants and cause a dislocation in the vegetation zones. Caution needs to be exercised, because the models available in the region and in the world suggest that rising water levels and inundation of the surface soils would result in the death of the vegetation.
51. **Difficulties of restoration.** The above paragraphs detail the difficulties - indeed the impossibility - of restoring the original dune structure after the mining operation has been completed. As noted in paragraph 30, RBM has embarked, in the area where its present mining operation is being carried out, on a process of replacing topsoil and rehabilitating vegetation. While vegetation cover has been re-established with considerable rapidity, the restored vegetation is altogether more simple and less varied than the original cover. Naturally, those carrying out the rehabilitation programme realize that this is a long process and preach patience to the skeptics. It must nevertheless be doubted whether a complex dune forest which has grown up over millennia can ever be really reconstituted with such an altered dune structure and soil composition (see paragraph 46).
52. **Effects on ecotourism.** It is intended that the final land-use in the St. Lucia area will be ecotourism, whether or not the mining operation is authorized (see paragraph 38). In the short term the problem is that the proposed mining operation would take place at the gateway to the St. Lucia System. Thus, all arriving visitors would have to pass the scene of the mine and see the scars made on the forest and dunes by the open cast mining. This could cause a long-term drop in popularity of the area which would be hard, perhaps

impossible, to overcome in the long run.

53. **Compensation in the event of delisting.** If the mining is allowed to go ahead, the South African authorities would need to consider whether all or part of the St. Lucia System should be deleted from the Ramsar List. The considerations put forward in the present report emphasize that the mining operation would be likely to have effects on the hydrology and dune stratigraphy well beyond the immediate area of mining. It would be extremely difficult to compensate for a site as individual as St. Lucia, whether as a whole or in part (see paragraph 34)
54. **Possible changes in land use in the light of changing policies in South Africa.** The Ramsar mission was made very aware of the enormous changes - political, social and economic - that South Africa is currently going through. Many current assumptions about government policies and practices may prove to be invalid when the shape of the future governance of the country becomes clear. The mission is very anxious that its report should be of relevance not only to the present authorities, but to any new authorities which might emerge when the present consultations are concluded. The mission recognizes that it had very little opportunity to consult local people in the area of St. Lucia, or leaders of black communities in Pretoria or elsewhere.
55. Most of the local people it was possible to interview in St. Lucia were of the opinion that the mining activity should not be allowed in the St. Lucia System. They expressed the need to have the area maintain its protected status and to be developed only for ecotourism-based activities. They were concerned that, once the mining activity was undertaken, St. Lucia wetlands would suffer irreversible damage and that the impacts of the mining activity would extend to the adjacent marine parks. Among the people interviewed were a high school headmaster, a local Nkosi (chief), and a professor of the University of Zululand.
56. Before the first reserve was established at St. Lucia, the area was inhabited by Zulu and other peoples. The mission was informed that, at some future time when new political and administrative arrangements for South Africa have been decided, Zulu or other peoples might wish to settle in the areas currently gazetted as reserves. Equally, local people who are dependent on jobs at the RBM mine and processing plant might be much more favourable to maintaining the mining operation and the jobs it provides locally.
57. The mission however wishes to emphasize that the Ramsar concepts of conservation and wise use of wetlands are valid in a variety of states with widely differing levels of economic development. Thus, Ramsar Contracting Parties include both highly industrialized states of northern Europe and a growing number of countries in Africa, Asia and the Neotropics where wetland values and functions play a major role in social and economic development.
58. In Kenya, for instance, the establishment of protected areas in the form of National Parks and Reserves dates back to the beginning of this century. When Kenya attained her

independence from colonial rule in 1963, the established areas were retained and new ones created. The first marine parks in tropical Africa were established by Kenya in Malindi and Watamu in 1968. As of now, Kenya has 53 terrestrial and marine National Parks, Reserves and Sanctuaries covering an area of about 4.5 million hectares. This represents about 8% of the total land area of Kenya. Additional protected areas have recently been proposed. It is important to add that ecotourism is the leading income-generating (foreign exchange) industry in Kenya.

“Wise use” of the broader area around St. Lucia

59. The Ramsar concept of wise use of wetlands is generally interpreted in the sense of planning land use over a broad area of wetlands, where establishment of strict conservation areas and measures is combined with sustainable use of wetland functions and values. The St. Lucia System is the protected core area of a much wider coastal plain, which includes other Ramsar sites (Lake Sibaya and Kosi Bay) and potential Ramsar sites such as Ndumu and the Pongolo river floodplain). The plain also includes former wetlands which have lost many of their wetland values and functions through drainage. The coastal plain in fact continues into Mozambique, a country which has not yet become a Contracting Party to Ramsar, but which has indicated to the Ramsar Bureau that it intends to do so in the near future.
60. The Ramsar mission was of the strong opinion that it would be appropriate to develop a structure for planning the wise use of wetland resources throughout the whole of the Maputaland coastal plain, to include the Mozambique sector. South African experts have already undertaken missions to advise the authorities of Mozambique on establishment and management of reserves, and their advice on broader issues of land use and planning would undoubtedly be welcome in today’s fast-changing political climate. A structure of this kind might also be best suited to address the difficult problems of future land use (outlined above in paragraphs 54-57) in the St. Lucia System.
61. Such a structure could also review the situation of the various reserve areas around St. Lucia and could give a legal basis to the concept of the “Greater St. Lucia Wetland Park”. The Ramsar mission understands that similar cross-frontier measures have been discussed for the Kruger National Park, which also lies across the frontier between South Africa and Mozambique.

Summary of recommendations.

62. As pointed out in paragraph 33, the present report is intended as a contribution to the St. Lucia debate from an international point of view. The final decision on whether RBM may exercise its mining rights will be taken by the South African government, after scrutiny of the national EIA currently being conducted. The Ramsar Bureau in no way wishes to pre-empt the conclusions of that EIA, but simply to pinpoint a number of issues which the authorities may wish to consider more fully. If the South African authorities consider it appropriate, the Ramsar Bureau will be happy to help in any way it can in the further

discussion of these issues.

63. The recommendations, which have already been outlined in the body of the present report, may be summarized as follows:
- The South African authorities should consider whether, in view of the importance of the St. Lucia System, the application to exercise mining rights should be refused on principle (paragraph 34).
 - If the South African authorities decide to give further consideration to the possibility of authorizing RBM to exercise its mining rights, the following issues should be given special consideration:
 - alternate sources of ore (paragraph 35)
 - need for an environmental cost/benefit analysis of the mining operation (paragraph 36)
 - aspects where the proposed mining would have a critical impact on the St. Lucia System (paragraphs 43 to 50)
 - the difficulties of restoration (paragraph 51)
 - effects on ecotourism (paragraph 52)
 - designation of wetlands for the Ramsar List in compensation, in case of delisting or restriction of boundaries (paragraphs 34 and 53)
 - possible changes in land use in the light of changing policies in South Africa (paragraphs 54 to 58)
 - The South African authorities should consider developing a broad plan for the wise use of the whole Maputaland coastal plain, in collaboration with the Mozambique authorities (paragraphs 39 to 41 and 59 to 61).

Expression of the mission's thanks.

64. The members of the mission wish to express their warmest thanks to the South African authorities and to all those, from a variety of backgrounds, who helped them during their visit to South Africa. (The list of persons contacted is given in Appendix III). They hope that their report will be of use, and will be happy to take part in any further discussions of the future of St. Lucia.

M. Smart
Gland, Switzerland 7 December 1992

APPENDIX II

PROGRAMME OF THE RAMSAR MONITORING MISSION

Members of the Monitoring Mission:

Prof. Steven Njuguna: National Museums of Kenya, representative of Government of Kenya (Alternative Representative for Africa) on the Ramsar Standing Committee.

Dr. Vic Semeniuk: Research and Educational Consultant in Environmental and Natural Sciences, Perth, Western Australia.

Mr. Michael Smart: Assistant Secretary General, Ramsar Bureau, Gland, Switzerland

Observer with the mission:

Dr. C. Max Finlayson: Assistant Director (Wetlands), International Waterfowl and Wetlands, Research Bureau, Slimbridge, UK.

Terms of reference of the mission

Following correspondence between the Ramsar Bureau and the Minister of National Education and Environmental Affairs, it was agreed that the terms of reference of the mission should be as follows:

1. To apply the Ramsar Monitoring Procedure at the St. Lucia System Ramsar site.
2. To visit other wetlands in South Africa which are included in the Ramsar “List of wetlands of international importance” or which are candidates for inclusion.
3. To take part, as appropriate and in collaboration with the South African authorities, in activities to emphasize and publicize the value of wetlands and the need for their conservation and wise use in the spirit of the Ramsar Convention.
4. To disseminate the aims and objectives of the Ramsar Convention more widely at regional level in southern Africa, in South Africa itself, but more particularly in Botswana, Lesotho and Namibia, which are not yet Contracting Parties.
5. To attend the forthcoming meeting of the South African Ramsar Committee.

Programme:

Monday 27 April: Mission participants arrive in Johannesburg and travel to Pretoria. Meet officials of Department of Environment Affairs (DEA). Meet members of St. Lucia Environmental Impact Assessment (EIA) Assessment Management Committee [and consultants and RBM representative]

Tuesday 28 April: Fly Johannesburg to Richards Bay. Visit Richards Bay Minerals (RBM) headquarters and rehabilitation programme with RBM staff. Meet Natal Parks Board (NPB) staff at St. Lucia.

Wednesday 29 April: Fly by light plane from St. Lucia to Durban to meet three members of EIA Review Panel (Justice R. Leon, Mrs. S. Hotz and Prof. R. Soni). Visit Eastern Shores, St/Lucia, with DEA and NPB staff [and RBM staff].

Thursday 30 April: Attend briefing on St. Lucia by conservation NGOs at NPB auditorium, St. Lucia. Present lecture on international wetland conservation at NPB auditorium, St. Lucia.

Friday 1 May: Fly by light plane (3½ hours) over Richards Bay, whole St. Lucia System, Lake Sibaya, Kosi Bay, Ndumu and Pongola River with DEA and NPB staff. Further visit to Eastern Shores, St. Lucia, with DEA and NPB staff.

Saturday 2 May: Ground visits to Richards Bay beach, St. Lucia Mouth and Western Shores, St. Lucia with DEA and NPB staff.

Sunday 3 May: Ground visits to beach from Cape Vidal to Sodwana Bay (i.e. along Turtle Beaches/Coral Reefs of Tongaland Ramsar site), Sodwana Bay and Mkuze Swamps with DEA and NPB staff.

Monday 4 May: Ground visit to Lake Sibaya Ramsar site, with staff of DEA, NPB and KwaZulu Bureau of Natural Resources (KBNR).

Tuesday 5 May: Ground visit to Kosi Bay Ramsar site, with staff of DEA, NPB and KBNR.

Wednesday 6 May: Ground visit to Ndumu Game Reserve (potential Ramsar site), with staff of DEA, NPB and KBNR. Fly Richards Bay to Johannesburg; drive to Pretoria.