NATIONAL ESTUARINE MANAGEMENT PROTOCOL

Guidelines for the Development and Implementation of Estuarine Management Plans




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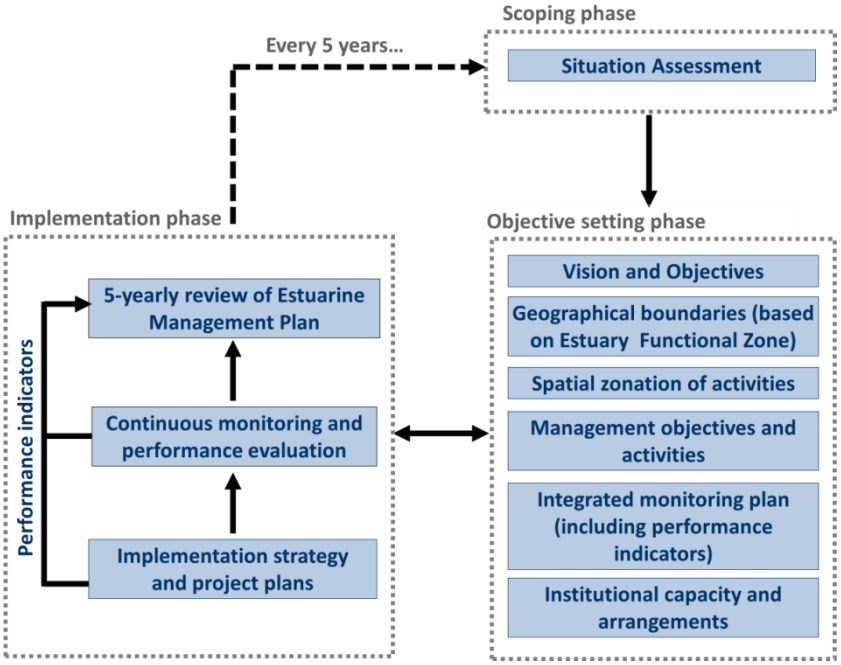
Executive Summary

This document presents guidelines for the development and implementation of individual Estuarine Management Plans as required by the National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008), as amended by the National Environmental Management: Integrated Coastal Management Amendment Act (Act No. 36 of 2014) (hereafter referred to as the ICMA) and in accordance with the National Estuarine Management Protocol (Protocol). An estuarine management framework is provided, based on the minimum requirements stipulated in the Protocol, structured in term of the three main phases, namely the Scoping phase, Objective setting phase and the Implementation phase.



The **Scoping phase** comprises a situation assessment to reflect on the current status of estuarine management in a specific estuary, conducted in collaboration with other relevant lead authorities and interested and affected parties, including estuarine scientists. The **Objective setting phase** entails the preparation of the Estuarine Management Plan, in accordance with the minimum requirements of the Protocol. The **Implementation phase** comprises the execution and monitoring of the estuarine management plan. During the implementation phase responsible departments (or sectors) are required to develop project plans for management priorities identified in the estuarine management plan, and to execute and monitor progress in accordance with monitoring plans. In the implementation on management plan an adaptive management approach (i.e. learning-by doing) should be followed where new learning (e.g. gained through monitoring) is continuously used to improve implementation strategies and execution of projects, and ultimately to improve the estuarine management plan. A detailed review of an estuarine management plan needs to be conducted at least **every five (5) years** in accordance with the Protocol.

Acronyms

BCLME	Benguela Current Large Marine Ecosystem
NEM:BA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
CAPE	Cape Action for People and the Environment
CARA	Conservation of Agricultural Resources Act (Act No. 43 of 1983)
CMP	Coastal Management Programme
CSIR	Council for Scientific and Industrial Research
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DMR	Department of Mineral Resources
DoT	Department of Transport
	Department of Tourism
DST	Department of Science and Technology
DPLG	Department of Provincial and Local government and municipalities
DPW	Department of Public Works
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
EMP	Estuarine Management Plan
EFZ	Estuarine Functional Zone
ICMA	National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008), as amended by National Environmental Management: Integrated Coastal Management Amendment Act (Act No. 36 of 2014)
IDP	Integrated Development Plan
KZN	KwaZulu-Natal
MEC	Member of the Executive Council of a coastal province responsible for designated provincial lead agency in terms of the ICMA
MLRA	Marine Living Resources Act (Act No. 18 of 1998, amended 2000)
MoA	Memorandum of Agreement
MoU	Memorandum of Understanding

MPRDA	Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)
MSP	Marine Spatial Planning
MSA	Municipal Systems Act (Act No. 32 of 2000)
NHA	National Health Act (Act No.61 of 2003)
NBA	National Biodiversity Assessment
NCMP	National Coastal Management Programme
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NMMU	Nelson Mandela Metropolitan University
NWA	National Water Act (Act No. 36 of 1998)
NWMS	National Waste Management Strategy
NEM:PAA	National Environmental Management: Protected Areas Act (Act No. 57 of 2003)
Protocol	National Estuarine Management Protocol
SALGA	South African Local Government Association
SAMSA	South African Maritime Safety Authority
SAMSAA	South Africa Maritime Safety Authority Act (Act No. 5 of 1998)
SANBI	South African National Biodiversity Institute
SANParks	South African National Parks
SDF	Spatial Development Framework
SPLUMA	Spatial Planning and Land Use Management Act (Act No. 16 of 2013)
SOPs	Standard Operating Procedures
TNPA	Transnet National Ports Authority
NEM:WA	National Environmental Management: Waste Act (Act No. 59 of 2008)

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Structure of this Guideline Document

This document presents guidelines for the development and implementation of individual Estuarine Management Plans as required by the National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008), as amended by the National Environmental Management: Integrated Coastal Management Amendment Act (Act No. 36 of 2014) (hereafter referred to as the ICMA) and in accordance with the National Estuarine Management Protocol (Protocol).

The Introduction (Chapter 1) sets the scene, providing some background on South Africa's estuaries, their values, major pressures and government's response to address estuarine management. The context of estuarine management plans are then provided, followed by a proposed management framework for estuarine management in alignment with the Protocol. The responsibilities related to estuarine management planning is then highlighted and, finally the strategic vision and objectives, as well as the Management Standards for estuarine management, as set out in the Protocol, is summarised.

Chapter 2 and 3 address the first two phases in the management framework - namely the Scoping and Objectives setting phases. The proposed tasks within each phase are discussed, as well as specific details on the Situation Assessment Report and Estuarine Management Plan; the products of these two phases. Chapter 4 addresses the final phase in the management framework - the Implementation phase. Chapter 5 details the approval processes to be followed for estuarine management planning, and also comments on the 5-yearly review process.

Finally, a number of appendices are provided as follows:

- Appendix A: Proposed content of Situation Assessment Report
- Appendix B: Proposed content of Estuarine Management Plan
- Appendix C: Terminology for Zonation of Activities
- Appendix D: Proposed Template for Project Plans
- Appendix E: Proposed Template for EMP reviews.

1 Introduction

1.1 Background

1.1.1 South Africa's estuaries

The National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008), as amended by the National Environmental Management: Integrated Coastal Management Amendment Act (Act No. 36 of 2014) (hereafter referred to as the ICMA) defines an estuary as:

> *A body of surface water - a) that is permanently or periodically open to the sea; (b) in which a rise and fall of the water level as a result of the tides is measurable at spring tides when the body of surface water is open to the sea; and (c) in respect of which the salinity is higher than fresh water as a result of the influence of the sea, and where there is a salinity gradient between the tidal reach and the mouth of the body of surface water*[1]

South Africa's coastline stretches from the Orange River on the west coast to Ponta do Ouro on the east coast, a distance of approximately 3 100 km spanning three biogeographical regions Brown and Jarman (1978) (Figure 1).

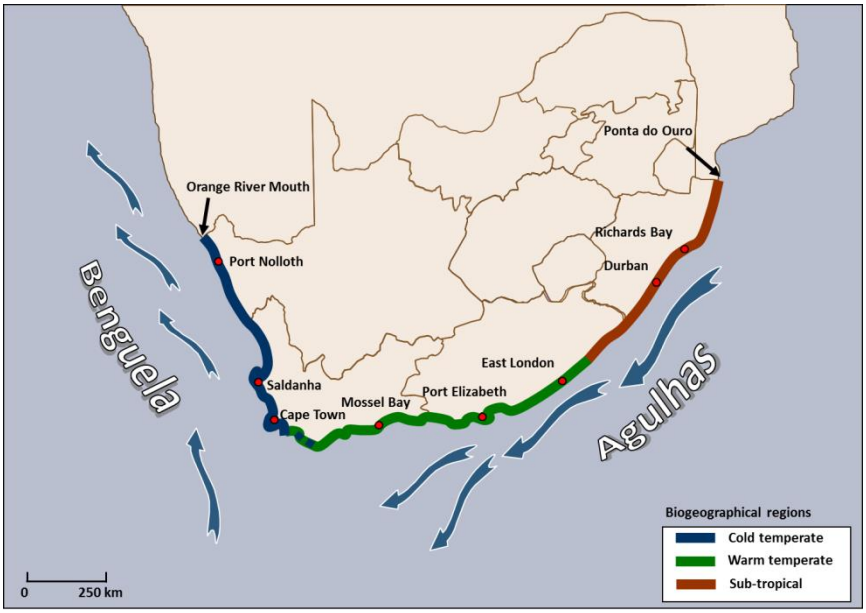


Figure 1: Biogeographical regions along the South African coast

[1] The repealed GN R 546 Listing Notice 3 under the NEMA EIA Regulations (2010) now GN R 985 of 2014, identifies the estuarine functional zone as a sensitive area that requires environmental authorisation before a development may proceed. It is important that this consideration is also taken up in the definition of estuaries in the ICM Act (and National Water Act). The definitions of both Acts should recognise the value of the estuarine floodplain and the threat of (back) flooding within this zone (a critical aspect the ICM Act does not address in its current, or proposed form, as this area is often fresh, i.e. not diluted by sea water). In this light the NBA 2011 proposed the following definition for South African estuaries: *"An estuary is a partially enclosed, permanent water body, either continuously or periodically open to the sea on decadal time scales, extending as far as the upper limit of tidal action or salinity penetration. During floods an estuary can become a river mouth with no seawater entering the formerly estuarine area, or, when there is little or no fluvial input, an estuary can be isolated from the sea by a sandbar and become a lagoon or lake which may become fresh or hypersaline"* (Van Niekerk and Turpie, 2012).

These are the cool Temperate west coast, warm Temperate south coast and subtropical east coast (Van Niekerk and Turpie, 2012). Rainfall patterns in the different regions vary greatly as a result of South Africa's highly variable climate. River inflow to the estuaries is determined by these climatic conditions, as well as the size and shape of the catchment, the latter controlling the magnitude and flow distribution of runoff (Reddering and Rust, 1990). Around 300 functional estuaries are present along South Africa's coastline, classified broadly into six types (Whitfield, 1992) based on a variety of criteria such as mouth characteristics, tidal prism and catchment size (Table 1). The distribution of the estuarine types within the three biogepgraphical zone is presented in Table 2.

Table 1: Different estuarine types along South Africa's coast

ESTUARINE TYPE	GENERAL DESCRIPTION	TIDAL PRISM	CATCHMENT
Temporarily open/closed (75%)	Systems range in size, but smaller than estuarine lakes; periodically closed off from the sea by a sand bar forming across the mouth. Closure is determined by river flow, high wave action and availability of sediment in the vicinity of the mouth.	Small ($<10^6$ m^3) (absent under closed conditions)	Usually small (<50 km^2)
Permanently open (18%)	Medium to large (50 - 3 600 ha), permanently open systems where tidal exchange is sufficient to keep the restricted mouth open even during periods of low river inflow. Upstream intrusion of saline water is largely controlled by river inflow, with extensive intrusion occurring during extended low flow periods.	Medium (10^6-10^7 m^3)	Medium to large (>500 km^2, but often >10 000 km^2)
River mouths (4%)	Usually small to medium (e.g. 10 – 200 ha) systems that are open to the sea, although mouth closure occurs during extended periods of low river inflow. River inflow is characterised by heavy silt loads, consequently the systems are shallow (<2 m water depth). Saline intrusion seldom occurs any significant distances upstream.	Small ($<10^6$ m^3)	Large (>10 000 km^2)
Estuarine bays (2%)	Large (>1 200 ha), permanently open systems with deep mouths (>3 m). This resulting in marked tidal variation in the middle to lower reaches, and marine dominance.	Large ($>10^7$ m^3)	Relatively small compared to their size
Estuarine lakes (3%)	Large systems (>1 200 ha) but with a restricted connection to the sea (e.g. sand bar). When cut off from the sea, the systems function as coastal lakes.	Small to negligible	Small to medium
Modified or canalised estuary	Systems that have been canalised or physically modified extensively		

Table 2: Distribution of estuary types in the three biogeographical regions of South Africa (Whitfield, 1992 updated from Van Niekerk and Turpie, 2012)

ESTUARY TYPE	BIOGEOGRAPHICAL REGION		
	COOL TEMPERATE	WARM TEMPERATE	SUBTROPICAL
Estuarine bay	0	1	3
Permanently open estuary	2	29	16
Estuarine lake	2	2	4
Temporarily open/closed estuary	27	84	106
Modified or canalised estuary	1	2	0
River mouth	2	6	4

1.1.2 Value of estuaries

Estuaries of South Africa represent much of the sheltered marine habitat along South Africa's coastline and consequently they are important for biodiversity as well as socio-economic development (Van Niekerk and Turpie, 2012). The great value of estuaries is reflected in the vast amount of ecosystem services that these sensitive ecosystems provide (e.g. Costanza *et al.*, 1997; Van Niekerk and Turpie, 2012), such as Table 3:

Table 3: Summary of ecosystem services provided by estuaries

CATEGORY	GOODS AND SERVICES	EXAMPLES OF OPPORTUNITIES & ACTIVITIES
Ecological	Biological Control	Maintaining the balance/diversity of plants/ animals
	Refugia/Migratory Corridors	Fish and crustacean nurseries and roost for migratory birds
	Sediment supply	Creation and maintenance of beaches, sand bars and sand banks
	Erosion control	Prevention of soil loss by estuary vegetation, and by capturing soil in reed beds and mangroves
	Soil formation	Accumulation of sediment and organic material on floodplains and in mangroves
	Nutrient supply and cycling	Nutrient supply, nitrogen fixation and nutrient cycling through food chains
	Genetic Resources	Genes for mariculture, ornamental species and fibre
	Disturbance regulation	Flood control, drought recovery and refuges from natural and human induced catastrophic events (e.g. oil spills)
Subsistence	Collection of living resources for food	Line fishing, inter-tidal collecting, beach and seine netting
	Raw material for subsistence use (e.g. building material)	Harvesting of craftwork and house-building materials
Recreational & Tourism	Nature appreciation	Providing access to estuaries and associated wildlife for viewing and walking.
	Scenic views	Resort, residential houses, housing complexes and offices with scenic views, increasing turnover of properties with seaview
	Culture	Aesthetic, educational, research, spiritual, intrinsic and scientific values of estuary ecosystems
	Sports fishing	Estuary flyfishing, estuary and inshore conventional fishing
	Water sports	Water sports: swimming, sailing, canoeing, skiing and kayaking
Commercial and Industrial	Waste treatment	Breaking down of waste and detoxifying pollution
	Water supply and regulation	Water supply to marine environment and water for mariculture
	Mariculture (e.g. oysters, bait, etc.)	Production (natural and cultivated) of fish, crustaceans and worms
	Commercial food production	Fishing
	Raw material for commercial use	Diamond and titanium mining
	Transport services	Ports, harbours, marinas and skiboat launching sites

Historical studies (e.g. Turpie and Clark, 2007) provided some indication of the value of South Africa's estuaries based on an assessment of the temperate biogeoraphical region (Orange-Mdumbe). Subsistence value was evaluated using the raw survey data collected as part of the Subsistence Fisheries Task Group assessment (Clark *et al.*, 2002). These data were reanalysed to isolate the numbers of fishers, catches and values of individual estuaries throughout the study area. Total estimated subsistence value ranged from zero to R800 000 per estuary, with an average of R70 000. Property value of estuaries is the premium paid for access to or views of estuaries and represents the value or willingness to pay for that amenity. It is usually estimated using a form of multiple regression (hedonic pricing analysis) or through expert (estate agent) estimates. Some 77 estuaries had a positive property price premium, ranging from about R1

million to R2 billion per estuary, but most fell in the R10 – 50 million range. Tourism value of an estuary is reflected in visitors' expenditure on travel and accommodation. However, only a portion of the recreational experience, and hence part of this expenditure, can be attributed to the estuary itself. Tourism value was estimated by interpolation between estuaries of known value, based on expert understanding of these systems. The majority of estuaries had a tourism value of between R10 000 and R1 million per annum. The nursery value of estuaries is the value that they contribute to marine fishery production as a result of providing nursery areas for commercially or recreationally valuable species. This value has already been estimated on a regional level by Lamberth and Turpie (2003), and was disaggregated to individual systems on the basis of area (Table 4). The majority of estuaries had a nursery value in the range of R100 000 to R10 million per annum.

Table 4: The value of estuarine fisheries and estuary contribution to marine fisheries given in 1997 Rand (excluding crustacean fisheries) (Lamberth and Turpie 2003)

	COASTAL REGION					
	West	South	East	Transkei	KZN	Total
Estuarine fisheries (R million)	7.7	170.4	92.9	58.6	103.3	433.0
Inshore marine (R million)	10.1	169.2	191.3	30.6	89.3	490.4
TOTAL	**17.83**	**339.56**	**284.20**	**89.15**	**192.56**	**923.39**
No estuaries	9	52	54	67	73	255
Ha	5 884	12 866	3 764	2 612	46 811	71 937
Average value/estuary (R million)	2.0	6.5	5.3	1.3	2.6	3.6
Average value/ha (R)	3 030	26 392	75 503	34 131	4 114	12 836

The existence value of estuaries is the feeling of satisfaction that their existence generates. People are willing to pay to maintain that feeling and this willingness to pay (WTP) is used to reflect this value in monetary terms. Turpie and Clark (2007) suggested an overall WTP of R90 million for South African estuaries, based on mainly scenic beauty and biodiversity importance.

1.1.3 Need for estuarine management

The ecosystem services provided by South African estuaries – and the associated value – are increasingly been threatened by human activities and large scale environmental change. The National Biodiversity Assessment (NBA 2011) (Van Niekerk and Turpie, 2012) identified five main pressures impacting on these valuable resources, namely:

- Flow modification (e.g. water abstraction, alien plants, forestation, increased urban runoff)
- Pollution (e.g. agriculture, waste water treatment works, industrial, sediment)
- Exploitation of living resources (e.g. fish, invertebrates and mangroves)
- Habitat destruction (e.g. low lying developments, bridges, jetties and other structures in and around estuaries, mining,)
- Climate change (e.g. as reflected in modification in rainfall, changes in temperature, increased storminess and sea level rise).

These pressures stem from the burgeoning demand on coastal (and estuarine) resources to support ever-increasing coastal development. While coastal development has the potential to both grow and sustain

local coastal, national and regional economies, those same developments threaten to destabilise these sensitive systems. In addition, threats introduced by changes in climate are superimposed on the anthropogenic (or man-made) pressures. To realise and maximise the benefits (ecosystem services) from estuarine resources, growth and development must be achieved based on sound sustainability principles. Estuarine resources are already in a declining state and this is exacerbated by potential (and not fully understood) impacts emanating from the pressures (Van Niekerk *et al*. 2013).

Such demands and pressure on coastal systems (including estuaries) have escalated to the extent that a more strategic approach is required to address societal needs and socio-economic requirements. This requires integrated and cooperative efforts to ensure that *developments, activities, and uses* are managed to prevent undesired change to the affected environment. This is also the underlying motivation for the development of estuary management plans aim at preventing potential impacts on the environment, rather than responding only once the impacts have occurred.

1.1.4 Government's response in addressing estuarine management

Government's response in mitigating deterioration of South African estuaries is manifested in two pieces of key legislation, namely the National Water Act (Act 36 of 1998) and National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008), among others.

South Africa's National Water Act (1998) recognises the right to water for aquatic ecosystems, only second to the right to water for basic human needs. As part of the country's Water Resource Management Strategy a standard approach for determining the water requirements of aquatic ecosystems, including estuaries, has been developed. Most recently, the ICMA (2008) set out specific requirements for the development of a National Estuarine Management Protocol (Protocol) for South Africa, as well as the development of individual estuarine management plans.

South Africa's estuaries have a diversity of management requirements, often unique to individual systems, and are governed by a variety of authorities, from national to local level. Therefore, estuary management must allow for a dynamic process that facilitates integrated cross-sectorial planning and implementation including stakeholders involved in land-use planning, management of freshwater and marine resources, amongst others. Consequently, it was necessary to develop a flexible, but legally defensible Protocol providing guidance to estuarine managers at all levels to develop sound management plans to suit individual systems. South Africa's Protocol was published in May 2013.

Specifically the purpose of the Protocol (as set out in the ICMA) is to:

- Determine a strategic vision and objectives for achieving effective integrated management of estuaries
- Set standards for management of estuaries
- Establish procedures or provide guidance regarding how estuaries must be managed and how the management responsibilities are to be exercised by different organs of state and other parties
- Establish minimum requirements for estuarine management plans
- Identify who must prepare estuarine management plans and the process to be followed in doing so

- Specify the process for reviewing estuarine management plans (EMPs) to ensure that they comply with the requirements of the ICMA.

This document addresses the purpose of the Protocol in providing guidelines to assist responsible management authorities with the development and implementation of individual EMPs in accordance with the requirements of the ICMA.

1.2 Context of Estuarine Management Plans

While the specific requirement for the development and implementation of EMPs is stipulated in the Protocol (in accordance with the ICMA), there are numerous existing management initiatives promulgated under other Acts schematically illustrated in Figure 2 but not limited to the management initiatives below. It is critical that these management initiatives be considered in the development of EMPs which include:

- Coastal Management Programmes (ICMA)
- Biodiversity Management Plans (National Environmental Management: Biodiversity Act; NEM:BA as articulated in the NBA 2011 and future updates)
- Integrated Development Plans and Spatial Development Frameworks (Municipal Systems Act)
- Catchment Management Strategies (National Water Act; NWA)
- Classification of water resources, including estuaries (National Water Act)
- Water Resource Management (National Water Act)
- Living Resources Management Plans (Marine Living Resources Act; MLRA)
- Integrated Development Plans (Municipal Systems Act)
- Protected Areas (National Environmental Management: Protected Areas Act; NEM:PAA)

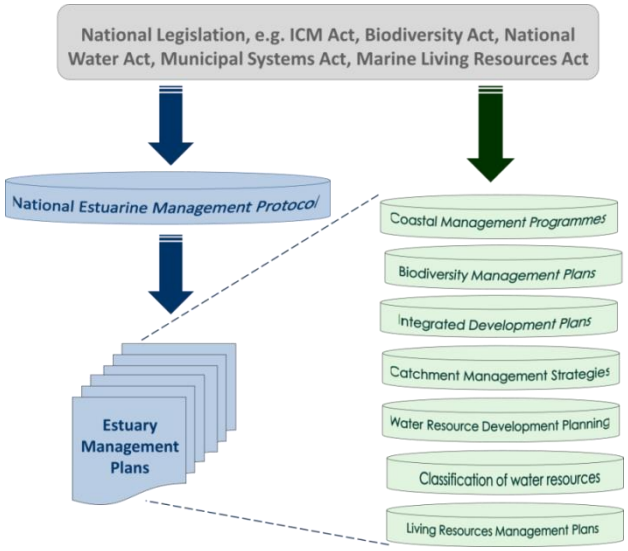


Figure 2: Schematic illustration of the context of individual estuarine management plans in the larger legal and policy framework of South Africa

Considering the above, sector-based management of estuaries are usually not effective and conflicts are bound to occur. The purpose of EMPs, in the spirit of the ICMA, therefore is to provide the mechanism that will enable coordination and alignment of management activities across sectors, underpinned by a shared vision – that is integrative estuarine management.

1.3 Framework for Estuarine Management

The Protocol sets the minimum requirements for EMPs as follows:

- A Situation Assessment Report that highlights the key information that would inform and/or influence the management decisions within the estuary
- A geographical description and a map of the estuary based on the Estuarine Functional Zone (EFZ) clearly identifying the boundaries of the system (deviations for the EFZ should be motivated for)
- The local vision and objectives that give effect to the strategic vision and objectives
- A list of management objectives and activities that will be required to maintain or improve the conditions of the estuary
- Details of intended spatial zonation specifying activities that may, or may not, take place in different sections of the estuary, also indicating organs of state to be consulted given the type of zonation proposed, as well as organs of state that will have to enact relevant laws to implement proposed zonation
- Detailed integrated monitoring plan with a list of performance indicators for gauging the progress with respect to achieving the objectives of the plan
- Details of the institutional capacity and arrangement required for managing different elements of the plan, taking into account different departmental mandates.

To provide structure to the above, a framework for integrated estuarine management is proposed to effectively manage estuaries (Figure 3). The framework represents a holistic approach for the preparation and implementation of an EMP. It is presented as a cyclic process as environmental management – including estuarine management – requires an iterative, adaptive approach where management is incrementally improved as new information and knowledge becomes available. The framework for estuarine management proposed here is informed by the requirements of the Protocol as well as the generic framework for EMPs of the C.A.P.E Estuaries Programme (CSIR, 2009).

Informed by the Protocol, the framework is organised into three main phases, namely the:

- Scoping phase
- Objective Setting phase
- Development of the Implementation phase.

The **Scoping phase** primarily comprises a situation assessment to reflect on the current status of estuarine management in a specific estuary, in collaboration with other relevant lead authorities and interested and affected parties, including estuarine scientists. This phase aims to "take stock" of the ecological condition of the estuary, its socio-economic context, the ecosystem services provided by the system, major threats

and pressures, as well as existing legal instruments and management initiatives. Such information, together with an assessment of opportunities and constraints, provides the context for the following phases.

The **Objective setting phase** primarily comprises the preparation of the EMP, in accordance with the minimum requirements of the Protocol. In ecosystem-based management, not only the ecological, but also the economic, social and cultural aspects are important (UNEP/GPA, 2006). Therefore the **vision** of an estuary should reflect these three pillars of sustainable development, but recognise the limits of the estuary resource(s) place on development. The **objectives** associated with a vision, articulate specific, measurable outcomes that will gauge progress towards meeting the vision. **Demarcation of the geographical boundaries** of a specific estuary comprises another key component in the Objective phase. The Protocol specifies the Estuary Functional Zone (EFZ), or motivated modification thereof, as the geographical boundaries of the estuarine management unit. Due to ever-increasing demand for estuarine space and ecosystem services, **spatial zonation** (i.e. specifying and mapping activities that may or may not take place within the EFZ), is increasingly becoming a necessity (e.g. Ehler and Douvere, 2009). The vision and objectives, together with the spatial zonation, provides the shared "blue print of the desired condition" envisaged for a specific estuary. Once this "blue print" has been agreed upon, the next step in the Objective setting phase is to identify specific issues that will be required to either maintain the estuary in this desired condition or to improve its current condition towards achieving the desired condition. This is addressed through the development of **Management objectives and associated activities**.

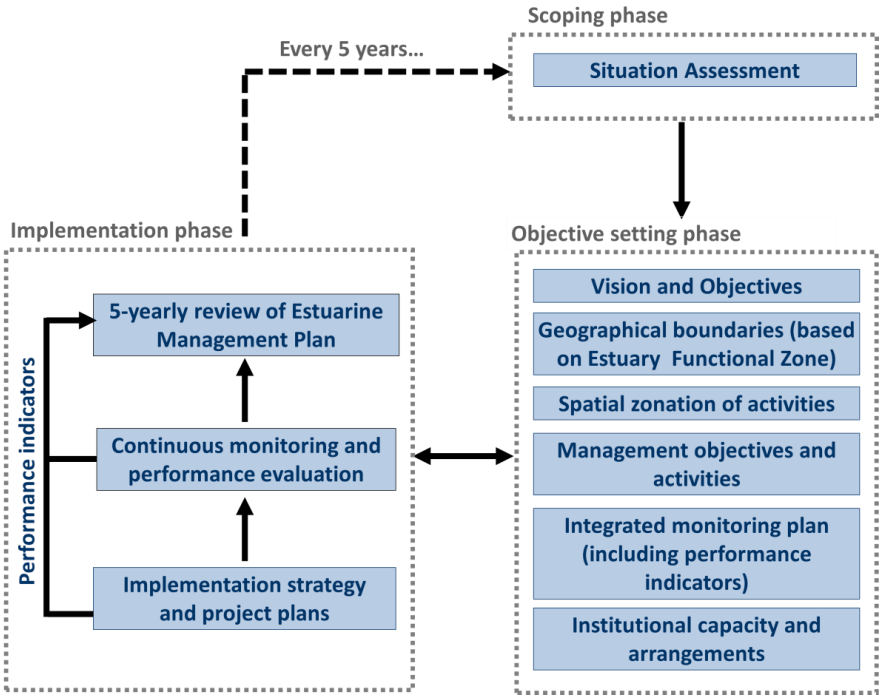


Figure 3: A framework for integrated estuarine management in South Africa

These can be organised into various categories or sectors such as conservation, living and non-living resource management, social issues, land-use and infrastructure planning and development, water quantity and quality, climate change, education and awareness, compliance and enforcement, or any other category of activities that may be required to maintain or improve the condition of an estuary.

The selection of performance indicators and the development of an integrated **monitoring plan** are fundamental to an estuary management plan, providing a design to continuously assess progress in terms of meeting vision and objectives set out for a specific estuary. A final component in the Objective setting phase is a detailed description of the **institutional capacity and arrangements** that will be required for a specific estuary in order to effectively execute the EMP, taking into account different departmental mandates.

The **Implementation phase** comprises the execution and monitoring of the EMP developed in the Objective setting phase. During this phase responsible departments (or sectors) are required to develop **project plans** in terms of prioritising and integrating their responsibilities in estuarine management. Importantly, such plans must be integrated into the broader departmental strategies to secure the necessary human and financial resources. As far as possible, responsible departments should collaborate to ensure the use of resources as effectively as possible. **Continuous monitoring** - as set out in the monitoring plan – must be executed to gauge progress towards achieving the objectives of the EMP. A detailed review needs to be conducted every five (5) years in accordance with the Protocol. Here an adaptive management approach (i.e. learning-by doing) should be followed where new learning gained from monitoring results is continuously used to improved implementation plans and execution of projects, and ultimately to improve the EMP, at 5-yearly intervals.

1.4 Responsibilities for Estuarine Management Plans

The Protocol very clearly stipulates the responsible management authorities for the development and coordination of the individual EMP. These are summarised in Table 5.

Table 5: Authorities responsible for the development of individual estuarine management plans

LOCATION OF ESTUARY	RESPONSIBLE MANAGEMENT AUTHORITY
Estuary falls within the boundary of a **single local or metropolitan municipality**	**Local or metropolitan municipality** in consultation with other relevant government departments
Estuary falls within the **boundary of more than one local municipality**	**District municipality**, in consultation with affected local municipalities and relevant provincial and national government departments (with written agreement the relevant local municipality/ies may be made responsible by the district municipality)
Estuary falls within the **boundary of more than one district municipality**	**Provincial environmental department** in consultation with affected district municipalities and relevant national government departments
Estuary **crosses the between provinces**	**National environmental department**, in consultation with provincial lead agencies for the ICMA and other relevant national government departments
Estuary falls within a **protected area or is identified as part of a protected area expansion strategy**	**Management authority responsible for protected area**, in consultation with relevant government departments
Estuary is a **harbour or port**	**National environmental department**, in consultation with the National Ports Authority (NPA) or other managing organs of state for a harbour, and responsible municipalities
Estuary **crosses a state boundary**	**National environmental department in collaboration with the responsible authority of the affected state/s**, consulting relevant departments of the affected states

The Protocol stipulates that the responsible management authorities must budget accordingly for the development of these plans. The Protocol does allow for private entities and non-government organisations to play a supporting role in the development of these plans. Also, the national department

responsible for the environment may be approached to provide technical and management support to capacitate a municipality where the need arises, but this will depend on the importance of the estuary in terms of meeting biodiversity targets and/or the strategic objectives of the national department.

1.5 Strategic Vision and Objectives

The Protocol provides the national (strategic) vision for estuary management in South Africa, that is:

> *"The estuaries of South Africa are managed in a sustainable way that benefits the current and future generations"*

In order to recognise and effectively manage the unique environmental, economic and social aspects estuaries, it is important to establish specific strategic objectives that state specific outcomes envisaged towards achieving the vision. For effective integrated management of estuaries the following (national) objectives are stipulated in the Protocol:

- *To conserve, manage and enhance sustainable economic and social use without compromising the ecological integrity and functioning of estuarine ecosystems,*
- *To maintain and/or restore the ecological integrity of South African estuaries by ensuring that the ecological interactions between adjacent estuaries, between estuaries and their catchments, and between estuaries and other ecosystem, are maintained,*
- *To manage estuaries co-operatively through all spheres of government and to engage the private sector/entities and civil society in estuarine management,*
- *To protect a representative sample of estuaries (such protection could range from partial protections to full protection) in order to achieve overall estuarine biodiversity targets as determined by the NBA 2011 and the subsequent updates,*
- *To promote awareness, education and training that relate to the importance, value and management of South African estuaries,*
- *To minimize the potential detrimental impacts of predicted climate change through a precautionary approach to development in and around estuaries and with regard to the utilization of estuarine habitat and resources.*

The strategic vision and objectives, as stipulated in the Protocol, must be recognised and reflected in the local vision and objective for individual estuaries that will be defined by the managing authority, in consultation with stakeholders during the Objective setting phase (Figure 3).

1.6 Management Standards

The Protocol provides a list of key management standards that must be adhered to in the management of any estuary. These must be considered the **Objective setting phase**, specifically in terms of the management objectives and associated activities. These management standards are as follows:

- Estuarine management must aim at **best practice in term of the use, management and protection** of estuaries based on principles of ecological sustainability and co-operative governance.
- Estuarine management planning must consider the **predicted impacts of climate change and management of potential disasters** including pollution events.
- Integration of **land use planning and natural resource management outcomes with estuarine management outcomes** must be promoted.
- Management actions (or activities) should be based on **sound scientific evidence and where lacking the precautionary approach** should prevail.
- An estuary must be management to **avoid, minimise or mitigate significant negative impacts** that include, but are not limited to, reduced water flows and loss of habitat or species.
- An estuary must be maintained in its **ecological category as determined in the 2011 NBA and subsequent updates in order to meet biodiversity targets**, and to take into account the recommended extent of protection and recommended ecological health category.
- The **classification and setting of the Ecological Reserve and Resource Quality Objectives (RQO)** of an estuary must take into account current ecological health status, recommended extent of protection and recommended ecological category in order **to meet the biodiversity targets as set in the 2011 NBA** and the subsequent updates.

2 Scoping Phase

2.1 Proposed Tasks

The Scoping phase (Figure 3) involves collating and evaluating available information about the estuary that can assist with the determination of the status of the estuary, and to inform the management planning process. Generally such information is available in the form of maps and reports from various government agencies and research institutions. It is imperative that local knowledge is considered during this phase. In accordance with the Protocol, the proposed tasks to be undertaken during the Scoping phase is summarised in Figure 4.

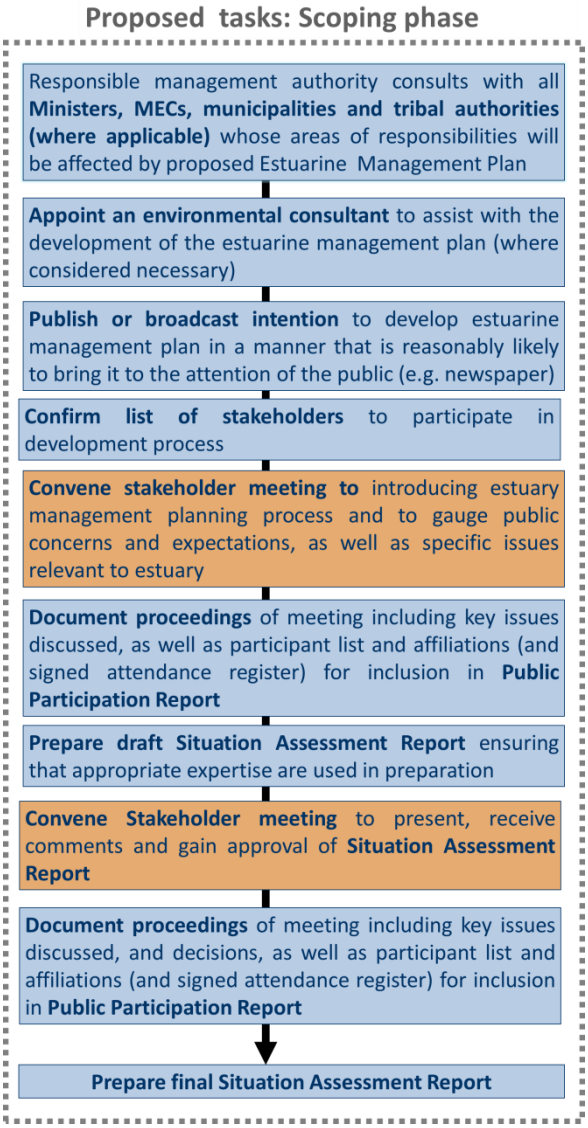


Figure 4: Scoping phase: Proposed tasks to be undertaken by responsible management authority

During the initial stage of the Scoping phase, the responsible management authority must consult with **other relevant government departments**, as well as **traditional authorities (where applicable)** whose areas of responsibilities will be affected by the EMP. It is important to note that while the Protocol stipulates the **responsible management authority** for the **development of EMPs (under the ICMA),** there

are other Acts that define different "management authorities" responsible for managing specific components of an estuarine resource. It is especially critical that the responsible management authority for the development of the estuarine management planning, actively engage with these other management authorities early on in the planning process. **Key (resource specific) management authorities** that must be engaged, where appropriate, is listed in Table 6.

Table 6: Key (resource specific) management authorities to be engage actively at onset of Scoping phase

RESOURCE COMPONENT	KEY LEGISLATION	MANAGEMENT AUTHORITY
Conservation	National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEM:BA)	Environmental Affairs (national) South African National Biodiversity Institute (SANBI)
	National Environmental Management: Protected Areas Act (Act No. 57 of 2003) (NEM:PAA)	Environmental Affairs (national) SANParks Provincial conservation authorities
Water	National Water Act (Act No. 36 of 1998) (NWA)	Water Affairs (national and regional) Catchment Management Agencies
Living Resources	Marine Living Resources Act (Act No. 18 of 1998) (MLRA)	Fisheries (national)
Land use planning and development	Local Government: Municipal Systems Act (Act No. 32 of 2000) (MSA)	Local Municipality Responsible Provincial department
	Spatial Planning and Land Use Management Act (Act No. 16 of 2013) (SPLUMA)	
	Provincial Planning Acts	
	National Building Regulations and Building Standards Act (No. 103 of 1977 amended 1982, 1984, 1989, 1995, 1996) (National Building Regulations and Standards Act)	
Ports	National Ports Act (Act No. 12 of 2005) (NPA)	Transnet National Ports Authority (TNPA)

Where a responsible management authority does not have the expertise, a suitable **environmental consultant** can be appointed to assist with the development process. However, the responsibility still resides with the appointed responsible management authority and it is very important that an official appointed to closely work with the consultant. This is critical for continuity into the implementation phase as consultants usually are appointed for a fixed period (e.g. Scoping and Objective setting phases). Also, close collaboration between the consultant and such officials provides great opportunity to build capacity, especially in municipal authorities. **Other authorities** that may also have to be consulted, in addition to **tribal authorities** (where appropriate) are listed in Table 7.

Before exercising its power – in this case the development of an EMP – the ICMA requires that the responsible management authority **publish or broadcast** their intention in a manner reasonably likely to bring it to the attention of the public. This can be done through means such as **local newspapers, notice boards in public places, letter accompanying municipal accounts.** Notification of the intention should be followed by a stakeholder meeting where the concept of estuarine management planning is introduced and the concerns and expectations of the public are gauged. Importantly this meeting also identifies sources of data and information required for the situation assessment, as well as to identify specific issues that should be assessed.

Table 7: Other important authorities to be engaged during the Scoping phase

ACTVITY	KEY LEGISLATION	AUTHORITY
Heritage areas	World Heritage Convention Act (Act No. 49 of 1999)	Environmental Affairs South African Heritage Resources Agency (SAHRA)
	National Heritage Resources Act (Act No. 25 of 1999)	
Mining	Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MRPDA)	Mineral Resources
Solid waste management	National Environmental Management: Waste Act (Act No. 59 of 2008) (NEM:WA)	Environmental Affairs Municipality
Wastewater	National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008)	Environmental Affairs Municipality
	National Water Act	Water Affairs
Agriculture	Conservation of Agricultural Resources Act (Act No. 43 of 1983) (CARA)	Agriculture (national/provincial)
Recreational water quality	National Health Act (Act No. 61 of 2003) (NHA)	District and Metropolitan Municipalities
State assets in estuaries	Government Immovable Asset Management Act (Act No. 19 of 2007) (GIAMA)	Public Works (national/provincial)
	State Land Disposal Act (Act No. 48 of 1961)	
Renewable energy activities	National Energy Act (Act No. 34 of 2008)	Energy
Defence activities	Defence Act, 2002 (Act No. 42 of 2002, amended 2010)	Defence

Prior to this meeting, stakeholders should be identified and personally invited to attend the meeting. Stakeholders, in addition to government and traditional authorities (where relevant), can include:

- Local Tourism Body;
- Heritage Association;
- Water User Association (WUA);
- Local estuary concern groups (such as conservancies or "Friends of …");
- Ratepayers' Association;
- Local developers and industries;
- Local angling or fishing groups;
- Faith-based organisations;
- Non-governmental organisations (NGOs);
- Community-based organisations (CBOs);
- Community PA (CPAs) and
- Ecological and social and resource-economic specialists.

Central to any EMP is a sound understanding of the functioning and state of an estuary, as well as the underlining processes, drivers and possible responses. As a result these aspects cannot be dealt with in a superficial manner in the Situation Assessment Report. Estuarine scientists are best equipped to provide guidance on these aspects down to site-specific level. Thus, where funding is limited, it may be more valuable to liaise with the Department to obtain technical and management support on these aspects.

Following this meeting the responsible management authority, in collaboration with their appointed environmental consultant **prepares a draft Situation Assessment Report.** If compiled in an appropriate manner, the Situation Assessment Report becomes a "tool" in itself for future management. For example, it can be used to highlight cause-and-effect relationship in and around a specific estuary. To ensure that

the content of the situation assessment report is appropriate, it is essential that estuarine scientists are part of the core team of consultancy/authority compiling the situation assessment report.

Once a draft Situation Assessment Report has been prepared, a **stakeholder meeting** needs to be convened to present the findings of the assessment, to obtain final comments and to get approval of the Situation Assessment. Following this consultation, the **final Situation Assessment Report** is prepared, the output for the Scoping phase.

An aspect that is often overlooked in stakeholder participation is the importance of documenting the participation process and key issues discussed (including decisions), as well as providing **participant lists,** including affiliations. Signed attendance registers may also be required. In order to judge for appropriate representation, the proceedings should also identify key stakeholders that were not present at the meeting and whose issues and concerns may not have been reflected. It is strongly recommended that proceedings of meetings are collated into a **Public Participation Report** (see Objective setting phase).

2.2 Situation Assessment Report

The Protocol stipulates the following minimum requirements for the Situation Assessment Report:

- Describe **legislative instruments** that are currently applicable to the effective management of the estuary, including **existing and planned management strategies/plans** (i.e. catchment management strategies, Integrated Development Plans, Spatial Development Frameworks, Coastal Management Programmes, disaster management plans, contingency plans, mouth management plans, etc.) and their relevance to the proposed management of the estuary. Also important to highlight current management challenges.

> ***Care should be taken with the collation of information on existing management initiatives for the situation assessment: this often requires more than anticipated effort to get the relevant information. Very important in the situation assessment, is the identification of links to the Municipal Integrated Development Plan (under the Municipal Systems Act) as this would facilitate proper integration into the broader strategies and implementation programmes of the relevant municipal authority.***

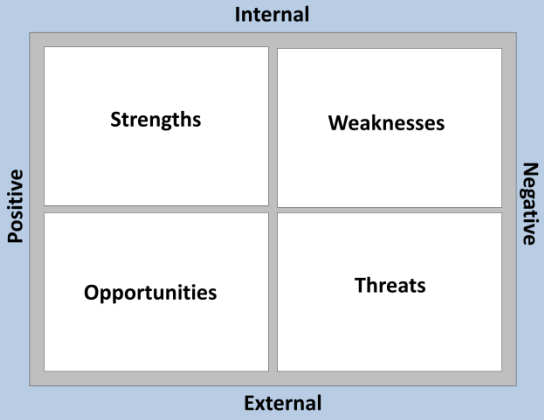
- Provide a detailed **understanding of the structure (abiotic and biotic components), functioning and state of the estuary**, including the underlying processes and drivers.
- This should also include the **Reserve for the estuary (also referred to as Ecological Water Requirement)** if it has been determined (or identify the need for determining the Reserve) and estimate the present ecological state of the estuary where possible. This should be done by using the Estuarine Health index as applied in the Ecological Water Requirement Methods of the Department responsible for Water.

> ***The National Water Act (No. 36 of 1998) requires that a Management Class (desired state), Reserve (quantity and quality of river inflow) and Resource Quality Objectives (measureable targets set for various abiotic and biotic components) must be set for water resources in South Africa, including estuaries. Methods for the Determination of the Ecological Water Requirements Reserve for estuaries (DWA 2013) have been published. Specifically, the method uses an Estuarine Health Index that provides a standardised approach by which to quantify the degree of modification in an estuary from its reference state to the present. This method is revised from time to time. Therefore it is important to use the latest official version thereof when having to determine the present ecological status of an estuary as part of the Situation Assessment.***

This index can be populated with very little information, but does require input form experienced estuarine scientist/s, for example the lowest confidence assessment would require input of at least one physical and one biological expert. A national-wide, desktop health assessment, using this index, has been done as part of the National Biodiversity Assessment 2011 (Van Niekerk and Turpie, 2012). Therefore, in instances where a Reserve study has not been done on a specific estuary, the NBA 2011 (or future updates thereof) should be consulted.

- Describe the geographic **socio-economic context** (demographic, economic profile, etc.) and the level/s of dependence of local communities on the estuary. This will include assessment of **opportunities and constraints** within the ecological system (including potential carrying capacity for activities and opportunities to support the concept of the green economy) taking into account the current and recommended ecological state and limits of acceptable change where available.

SWOT analysis (e.g. Fine 2009) is a useful technique for understanding the Strengths and Weaknesses, and for identifying both the Opportunities and the Threats (or Constraints) as part of a strategic planning process, in this case the development of EMPs for specific estuaries. It provides for a structured manner to distinguish between the internal and external factors of influence, as well as assessing the positive and negative factors to be considered. Positive factors are grouped together as 'strengths' (usually internal elements) and 'opportunities' (the external elements). Negative factors are grouped as 'weaknesses' (generally internal elements that cannot be modified in the short-term) and 'threats' (external elements):



Using a particular 'SWOT profile', key strategies can be developed to effectively utilize strengths and opportunities for a sustainable future, but also to overcome weaknesses and reduce vulnerability to external threats.

- Identify the **good and services or human use activities** (also referred to as ecosystem services) and their **impacts or potential impacts** on the present ecological state of the estuary (also important are events, such as historical disasters and/or environmental emergencies/incidents and fish kills).

The Situation Assessment Report should also **highlight any information gaps** that will impact on the effective implementation of the EMP and provide recommendation to address these.

Appendix A provides a proposed Table of Content for the Situation Assessment Report, based on the requirements of the Protocol. The Situation Assessment Report forms an integral part of the development of an EMP, providing a clear understanding of the *status quo*, as well as important considerations for estuarine management planning. It is therefore important to capture the key findings of this assessment – in the form of **an executive summary** – for inclusion in the introductory section of an EMP. The executive summary need not be elaborate, but should provide the key information necessary to inform the preparation of the management plan, including a summary of:

- Present ecological state, as well as desired ecological state
- Geographical socio-economic context
- Opportunities and constraints
- Good and services or human use activities
- Current, or potential, pressures and impacts
- Information gaps to be addressed in plan.

3 Objective Setting Phase

3.1 Proposed Tasks

The Objective setting phase (Figure 3) involves the development of the EMP in consultation with key stakeholders. This development process is informed by the Situation Assessment conducted in the Scoping phase. In accordance with the Protocol, the proposed tasks in the EMP development process are summarised in Figure 5.

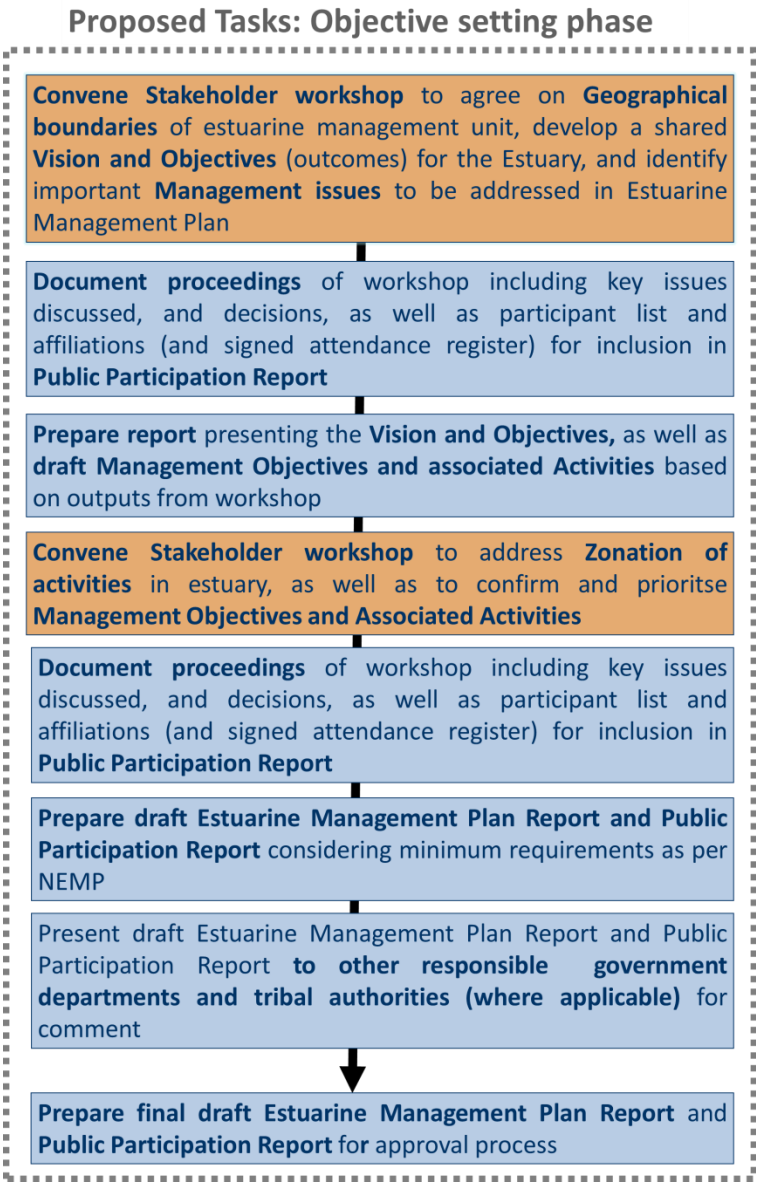


Figure 5: Objective setting phase: Proposed tasks to be undertaken by responsible management authority

The Objective Setting phase, in particular, requires active stakeholder participation. First, the responsible management authority needs to convene a stakeholder workshop to prepare a **Vision** and **Objectives** for the particular estuary. It is strongly recommended that the responsible management authority utilises recognised stakeholder consultation techniques to guide this process or that the authority appoint a

professional facilitator/consultant with experience in such matters. It is very important that stakeholders be informed of the results of the Situation Assessment Report before the vision and objectives setting are discussed at this workshop. In addition, this meeting also needs to identify important management issues and group these into logical categories or sectors as per the Protocol.

As for the Scoping phase, it is important to document the participation process and key issues discussed (including decisions), as well as proving **participant lists (and their affiliation).** Signed attendance registers may also be required. In order to judge appropriate representation, it is also important that the proceedings identify key stakeholders that were not present at the meeting and whose issues and concerns may not have been reflected in the outputs. Such proceedings are to be collated in the Public Participation Report**.**

Using the output from the workshop, as well as information presented in the Situation Assessment, the responsible managing authority (or appointed consultant) prepares a draft report articulating the Vision and Objectives, as well as translating the management issues identified in the workshop into specific Management Objectives and associated activities. Where there is reason to believe that important management issues were not identified at the Stakeholder workshop, as a result of inadequate representation, the managing authority must highlight these and consult with the relevant authorities responsible for the management of such issues. The draft report must be communicated to stakeholders prior to the next stakeholder workshop/s.

Building on the initial Stakeholder workshop, at least one follow-up workshop must be convened to address the zonation of activities in the estuary, as well as to confirm and prioritise the management objectives and associated activities prepared by the management authority. Systems with complex management issues have shown that, a single workshop may not suffice and additional workshop may have to be convened to address and gain agreement of future activities. Again, the proceeding of this workshop/s (e.g. workshop minutes) must be prepared as outlined previously.

Once the management authority has met the requirements in terms of stakeholder consultation (Figure 5), the draft **EMP Report and Public Participation Report** can be prepared (details on the content of this report is presented in the next section). Prior to submitting the draft EMP Plan Report for public comment and approval, **it is strongly recommended that the management authority engages with other responsible government departments, as well as tribal authorities (where applicable) to comment** on the draft reports to reduce conflict and manage expectations. Ultimately, the successful implementation of the EMP will rely on the cooperation of all responsible authorities, and sourcing their input to the draft plan is therefore important. The final draft EMP Plan Report and Public Participation Report are then prepared for approval.

3.2 Minimum Requirements for Management Plans

The Protocol stipulates the following minimum requirements for an EMP, namely to include:

- An **executive summary** of the **Situation Assessment Report** (see Section 2.2)
- **Geographic description and map** of estuary based on Estuarine Functional Zone (deviation should be motivated.
- Local **vision and objectives** giving effect to strategic vision and objectives of protocol
- List of **management objectives and activities** (also identifying relevant legal instruments and responsible authorities)
- Details of **intended spatial zonation of estuary** specifying activities that may, or may not, take place in different sections of the estuary
- Detailed **integrated monitoring plan** with list of performance indicators to gauge progress with achieving vision and objectives
- **Institutional capacity and arrangements** required for management.

Appendix B provides a proposed Table of Content for the EMP Report, based on the requirements of the Protocol. In the following sections each of the key components of an EMP is discussed in greater detail so as to provide management authorities with guidance in the preparation of their EMP reports.

3.3 Geographical Description of Estuary

Demarcation of the geographical boundaries of the jurisdictional space within which an EMP must be applied is critical (Halpern et al. 2008). For this reason, the Protocol requires that a map describing the geographical boundaries of an estuary be included in an EMP. Demarcation of such boundaries may be challenging because many of the threats posed by intensifying human activities and ecosystem change cannot necessarily be dealt with by managing the estuary in isolation from the river catchment and adjacent marine ecosystem (UNEP/GPA, 2006). However, for practical reasons, it makes sense to limit the size of an estuarine space to be managed. While such management boundaries stipulate the geographical space at the core of the management plan, this does not imply that anthropogenic influences outside these boundaries - which may impact on the core area – are excluded from the management plan. Such influences must still be assessed, and where necessary, specific activities should be recommended to address the related issues (e.g. as part of the identification of Management Objectives and Associated Activities).

In 2010, the concept of the Estuarine Functional Zone (EFZ) was adopted in South Africa's environmental legislation, more specifically in Notice 3 (repealed GN R 546; now GN R 985 of 2014) under the National Environmental Management Act (NEMA), Environmental Impact Assessment (EIA) Regulations (2010) (Van Niekerk and Turpie, 2012). This notice stipulates that estuaries - as defined by the spatial delineation of the estuarine functional zone – are 'sensitive areas' that require environmental authorisation before

developments within this zone may proceed. Where previously the 'geographical boundaries' of an estuary was assumed to be the 'open water body', the EFZ encapsulates additional area that support physical and biological processes and habitats necessary for that estuarine function and health (Van Niekerk and Turpie, 2012).

The EFZ (see Figure 6 as example) is defined as follows:

- Downstream boundary: Estuary mouth or where the mouth is closed, the middle of the sand berm between the open water and the sea
- Upstream boundary was determined: limits of tidal variation or salinity penetration, whichever penetrates furthest (where no data were available to set upper boundary, the +5 m topographical contour was used, bearing in mind that the tidal range in South Africa is microtidal [< 2 m] and sand bars at closed estuary mouths can sometimes build up as high as + 4.5 m MSL).
- Lateral boundaries: The +5 m topographical contour (obtained from Chief Directorate Surveys and Mapping) included, all the associated wetlands, intertidal mud and sand flats, beaches and foreshore environments that are affected by riverine or tidal flood events.

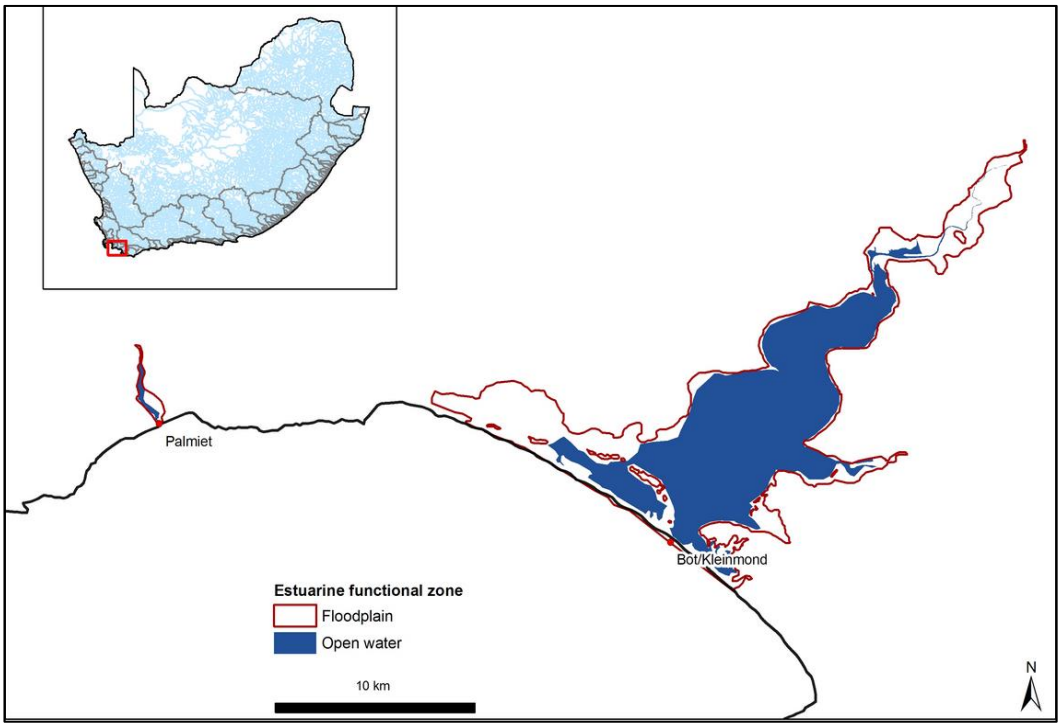


Figure 6: Depiction of the Estuarine Functional Zone, using the Bot/Kleinmond Estuary as an example (Source: http://bgis.sanbi.org/estuaries/project.asp)

Information on the EFZ of estuaries can be sourced from http://bgis.sanbi.org/estuaries/project.asp. However, it is important to note, that this national scale demarcation of the EFZ for South African estuaries was based on available information. It is therefore possible that, in some instances, the EFZ for an estuary may still exclude areas *'that support physical and biological processes and habitats necessary for that estuarine function and health'*. Examples include (Van Niekerk and Turpie, 2012):

- Estuaries with deeply incised floodplains, where the river/estuary bed may be meters below the mapped floodplain area.
- Estuaries where tidal action and/or back-flooding may extend further upstream than indicated by the +5 m contour on the topographical map.
- Freshwater wetland habitat that acts as biological filters and ensure a continuous freshwater supply in the dry season.
- Freshwater seeps and fountains that sustain estuarine microhabitats (so called refugia) and essential habitat for estuarine associated biota such as eels.

In such instances, the geographical boundaries of the EFZ may need to be adjusted. For this reason, the Protocol allows for the amendment of the EFZ, provided that sound motivation is provided.

3.4 Local Vision and Objectives

The Protocol provides the national (strategic) vision for estuary management in South Africa (see Chapter 1), but it is important that this vision be contextualised ('made their own') by stakeholders in and around a specific estuary – develop a shared, local vision. In the context of estuarine management, a local vision is a high-level statement of strategic intent expressed on the desired future state for an estuary (in terms of its ecological, social and economic environment). In essence, a vision answers the following question:

> *'How do you (the stakeholders) envisage the estuarine environment (the "ecosystem") should look in the future (considering the ecological, heritage and socio-economic environment)?'*

Why is it important to have a vision? For estuarine management to be effective, it is very important that the various role players (e.g. management authorities and stakeholders) have a common understanding of what they are trying to accomplish. Without a clear idea of where the management of a particular estuary is heading, there will be no sound basis for collaboration and prioritisation of management decisions. For example, in disputes on whether to address specific management objective and activities, these can be measured against the shared vision – i.e. *'Is this helping to achieve the vision?'* For this reason it is important that the vision for a specific estuary is developed by a representative group of stakeholders that will truly reflect the shared environmental, social and economic expectations within limits for sustainable development.

The Protocol provides a list of strategic objectives which national government views as desired outcomes of estuarine management in South Africa (see Chapter 1). As indicated in the list of national objectives, these outcomes should reflect estuarine environment in a holistic context, considering not only ecological values (biodiversity, conservation), but also **social** (heritage areas, archeologically, baptism areas, sense of place) and **economic values** (property/ land use planning, ecotourism, recreation). Objectives, in the context of a vision, are generally qualitative statements of the values (as defined in the vision) and should state *outcomes rather actions* of how to achieve them. In setting such objectives, the following question is answered:

'How will you know when you have achieved the Vision?'

Estuary Management and the Green Economy

A group of environmental economists in the UK first coined the concept of "Green Economy" in 1989 in a document entitled "Blueprint for a Green Economy" (Pearce et al. 1989). The purpose of this document (and sequels thereof) was to advise their government on measuring sustainable development in economic terms as well as to assist with the appraisal of government projects and policies. The interest in a green economy intensified following the recession of 2008-2009. Increasingly evidence pointed to an alternative paradigm, in which increased wealth does not lead to growing environmental risks, ecological scarcities and social disparities. Subsequently, UNEP defined the Green Economy as "one that results in improved wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP, 2011) and, therefore, aims to harmonise economic growth with environmental sustainability, by improving the eco-efficiency of economic growth and enhancing the synergies between environment and economy (UNDESA, 2012a).

The role of estuaries in supporting, for example coastal livelihoods through subsistence use or enabling poverty alleviation through eco-tourism opportunities is central to South Africa's transition to a green economy. This role is supported in the National Estuarine Management Protocol which aims to achieve "… greater harmony between ecological processes and human activities while accommodating orderly and balanced estuarine resource utilization…" through sound management of estuaries. The approach adopted in the Protocol is therefore congruent with the principles of a green economy, which include poverty reduction and the generation of sustainable livelihoods, while simultaneously respecting the ecological limits within which development should occur if it is to be sustainable (UNDESA, 2012a, b and c). More specifically, the process outlined in the Protocol for the compilation of EMPs makes provision for authorities and stakeholders to negotiate a shared vision and associated objectives. This creates an opportunity for 'green economic' priorities (e.g. creation of decent work, poverty reduction, the protection of ecosystems and the promotion of community well-being) to be integrated into estuarine management at the local scale. The connection with the Green Economy concept just needs to be made explicit when setting the Vision and Objectives for an estuary as part of EMPs.

Also important is to define desired timeframes within which these objectives should be achieved, as well as performance indicators/s against progress can be gauged through the integrated monitoring programme. A useful manner in which to summarise this information in the management plan is illustrated in Table 8.

Table 8: Example of Objective (outcomes) summary for inclusion in Estuarine Management Plan

OBJECTIVE (based on desired outcomes)	PERFORMANCE INDICATOR	PRIORITY
Estuary is awarded formal protection status	Formal protected area declaration	High/Medium/Low
Ecological health of ecosystem is improved	Ecological Health Category: A/B	High/Medium/Low
Estuary management initiatives created jobs for local communities	Increase in employment figures	High/Medium/Low
Sustainable tourism market is established	Increase in number of tourists per year	High/Medium/Low

3.5 Management Objectives and Activities

When developing the Management Objectives for the EMP the following question typically should be answered:

'What is preventing us from achieving the vision (i.e. issues) and what do we need to do to address those issues (i.e. actions)?'

These objectives are typically informed by the SWOT analysis and key threats/issues identified during the Scoping phase (i.e. the Situation Assessment). The Protocol lists a number of sectors or 'categories of issues' that must be considered in defining Management Objectives, and associated activities, as part of EMPs. These are:

- Conservation (taking into account priority biodiversity list in NBA 2011 or future updates)
- Utilisation of resources
- Social issues
- Land-use and infrastructure planning and development
- Water quality and quantity
- Climate change
- Education and awareness
- Compliance and enforcement
- Any other activities required to maintain/improve condition of estuary.

The sectors or 'categories of issues', as stipulated in the Protocol, provide a useful structure within which to present Management Objectives as experience has shown that key issues in estuaries can usually be grouped for ease of execution. In setting the Management Objectives, in consultation with stakeholders, it is also important to consult on time frames (i.e. *What are the envisaged time frames for achieving specific management objectives?*). Also important for future planning purposes are the associated activities (i.e. *Which activities will have to be undertaken towards achieving each objective?*).

Where possible, the benefits to be gained, consequences of no action, estimated cost and availability of resources to execute various activities should also be assessed as this is critical information necessary for the selection of management priorities for the 5-year period of the EMP. Benefits/consequences can be expressed in terms of ecological, social or economic aspects (in context of the vision) to be gained and/or lost. At the local level, a key constraint in execution of management plans is related to a scarcity of human resources, both in terms of capacity and capabilities which is vastly different among management authorities. For example, it will be unrealistic to expect activities (identified on paper) to be executed in remote areas where the human resources are simply not available to do so. This aspect will need to be addressed if such activities turn out to be of high priority. Finally, the estimated cost, as well as the expected duration for completion of an activity is required. Costing need not be specified in great detail,

but it will be important to at least have a good idea of such costs to later inform prioritisation and future budgeting. Providing the above supporting information for associated activities provides useful criteria for prioritisation (UNEP/GPA, 2006). An example to summarise this in the EMP is presented in Table 9.

Table 9: Example: Summary of Management Objectives, associated activities as well as useful supporting information for inclusion in the EMP

Management Objective 1: Protect and rehabilitate habitat in the estuarine functional zone

PROPOSED ACTIVITY	ECOLOGICAL IMPACTS/SOCIO-ECONOMIC CONSEQUENCES	EXPECTED AVAILABILITY OF HUMAN RESOURCES	ESTIMATED COST	EXPECTED DURATION
Activity 1: Remove unlawful obstructions along banks	Limit public access to estuary	Resources available in Municipality	R100 000	3 month
Activity 2: remove aliens from riparian zone	High water demand reducing freshwater inflow to estuary	DEA (Working for Coast)	R 100 000	1 year
Activity …				

Management Objective 2: Ensure sustainable use of estuarine resources

PROPOSED ACTIVITY	ECOLOGICAL IMPACTS/SOCIO-ECONOMIC CONSEQUENCES	EXPECTED AVAILABILITY OF HUMAN RESOURCES	ESTIMATED COST	EXPECTED DURATION
Activity 1: Control bait collection in estuary	Loss of important species	DAFF has limited resources in area	R50 000 per annum	Ongoing
Activity 2: Terminate illegal sand mining activities	Destruction of estuarine physical habitat	DMR to provide staff	Part of departmental mandate	2 months
Activity …				

3.6 Recommended Management Priorities

The aim of the chapter on *Management Objectives and Associated Activities* is to present a holistic perspective of the range of issues, impact or threats that should be addressed in a particular estuary in order to achieve the vision. These are expressed as a list of management objectives and associated activities addressing each of the categories of issues (or sectors) specified in the Protocol. In the spirit of participatory management, it is important for stakeholders to see that their contributions are being acknowledged, therefore the need to identify a comprehensive list of management objectives and associated activities. However, it is unrealistic to expect every management objective to be executed within the 5-year time frame of an EMP, therefore the need for the selection of Management Priorities (often referred to as Key Result Areas) to be addressed within the **5-year time period of the EMP**. These should be distilled from the **comprehensive list of Management Objectives and Activities** through a transparent prioritisation process (e.g. using the supporting information as criteria – see Table 9).

The Management Priorities need to then be articulated as priority actions, as well as the relevant legislation and responsible authorities. Listing of performance indicator/s is especially important to gauge progress. These should be monitored regularly during the implementation phase. The priority allocated to specific actions should be provided (e.g. high/medium/low) to inform responsible authorities on the degree of urgency of various actions. Table 10 provides an example on the information to be provided for Management Priorities in the EMP. Presenting Management Priorities in this manner

enables the estuarine management authority to easily extract information and communicate those to the respective government department/s for their consideration and adoption.

Table 10: Example: Summary of Recommended Management Priorities, as well as supporting information for inclusion in the EMP

Management Priority 1: Ensure sustainable use of estuarine resources

ACTION	RELEVANT LEGISLATION	RESPONSIBLE AUTHORITY	PERFORMANCE INDICATOR	PRIOTITY ALLOCATED (H/M/L)
Action 1: Remove unlawful obstructions along banks	ICMA	Municipality	Number of obstructions removed	M

Management Priority 2: Ensure sustainable use of estuarine resources

ACTION	RELEVANT LEGISLATION	RESPONSIBLE AUTHORITY	PERFORMANCE INDICATOR	PRIOTITY ALLOCATED (H/M/L)
Action 1: Terminate illegal sand mining activities	Mineral	Department of Minerals	Number of activities terminated	H
Action …				

3.7 Zonation of Activities

Spatial planning (or zoning) is one of the commonest systems of use in the management of terrestrial systems. However, burgeoning demand for marine and estuarine space and resources, not only for development (e.g. ports, fisheries, mariculture, mining, tourism, etc.) but also the need for biodiversity conservation necessitated the extension of spatial planning into these 'water' environment (Crowder et al. 2006; Halpern et al. 2012; Ehler and Douvere 2009; Katsanevakis et al. 2011; Taljaard and Van Niekerk, 2013). Planning and zonation of activities in these environments are increasingly becoming a necessity rather than an option. This need also has been acknowledged in the Protocol stipulating the zonation of activities as one of the minimum requirement in estuarine management planning.

In the context of estuarine management, the process of zonation (or spatial planning) can be defined as *"a process of analysing and allocating the spatial and temporal distribution of human activities and conservation areas in an estuary to achieve the vision and objectives (i.e. the envisaged outcomes)".* Therefore the zonation of activities (or zonation plan) provides a means of spatially depicting the envisaged desired state for a particular estuary.

In essence the zonation of activities in an estuary, as part of the Objectives setting phase, entails a negotiation process between management authorities and stakeholders comprising:

- Definition and spatially mapping of existing activities and use, e.g.
  - Areas of importance in the estuarine environment, including ecological, heritage and socio-economic aspects such as conservation and protected areas, ecological sensitive areas such as

macrophyte and invertebrates (prawn) beds, cultural and heritage sites, mariculture sites and recreation areas

- Existing development/activities as well as planned developments/activities, e.g. as demarcated in the IDP and SDF of the area, such as land-use as well as planning provisions of the surrounding land, infrastructure in the estuary (e.g. bridges, culverts, jetties, roads), waste disposal activities in the estuary (e.g. wastewater discharges, stormwater drains and waste dump sites)
- Existing zonation maps for the estuary, such as demarcation for exploitation of living marine resources (such as fishing and bait collection areas), zoning for recreational activities (e.g. "no wake" areas, "closed" areas), zones earmarked for rehabilitation and flood lines.

- Consideration of future activity and use scenarios, e.g.
  - Biodiversity planning requiring demarcation of new protected areas
  - Future development scenarios as per municipal IDPs and SDFs requiring estuarine space.
- Selection of the proposed zonation of activities (depicted as a zonation map) that may or may not take place in various section of the estuary, also providing:
  - Relevant legislation (e.g. acts, regulations, by-laws, guidelines, RQOs, etc.)
  - Stipulate 'conditions of use' for various zones where such conditions have been stipulated in acts, regulations, by-laws, guidelines, RQOs, etc.
  - Responsible authority (organ of state) that will need to be consulted given the type of zonation
  - Responsible authority (organ of state) that will need to enact the relevant laws to implement the proposed zonation (e.g. if a 'no-fishing zone' is proposed then either Department of Fisheries or Environment will be required to consider declaring a closed area or protected area, respectively).

Legislation governing spatial planning (including the ICMA) that may affect estuaries (as defined by the EFZ) is extensive, already occurring through an array of spatial planning initiatives as illustrated in Table 11. These spatial planning processes must be considered in the preparation of the zonation of activities in estuaries as part of the EMPs.

Table 11: Important spatial planning (or demarcation of use area) occurring/overlapping in estuaries

SPATIAL PLANNING PROCESS	KEY LEGISLATION/PLAN	RESONSIBLE AUTHORITY
Coastal public property	ICMA	National Department: Environment
Coastal protection zone	ICMA	
Coastal Access	ICMA	Municipalities/ Responsible provincial authority/ National Department: Environment
Biodiversity protection area as informed by biodiversity planning processes	NEM:BA	National Department: Environment South African National biodiversity Institute (SANBI) SANParks
	NEM:PAA	
	National Protected Area Strategy	National Department: Environment

SPATIAL PLANNING PROCESS	KEY LEGISLATION/PLAN	RESONSIBLE AUTHORITY
Marine Protected Areas (MPAs) and Protected Areas (PAs)	NEM:PA	National Department: Environment
National parks	NEM:PA	National Department Environment SANParks
Fishing zones	MLRA	National Department: Fisheries
Mining and exploration concessions	MRPDA	National Department: Mining
Shipping and navigation routes	MTA	National Department: Transport
	NPA	TNPA
	Port Expansion Strategies, e.g. Strategic Infrastructure Projects (SIPS)	TNPA
National Water Resource Strategy	NWA	National Department: Water
Agricultural spatial plans	CARA	National Department: Fisheries
Heritage areas	NHRA	National Department: Environment through South African Heritage Resources Agency (SAHRA)
Coastal management lines	The ICMA requires the establishment of these lines. In estuaries, considerations for management lines require inclusion of physical processes (e.g. flood lines) as well as ecological processes (e.g. as defined by the EFZ) and socio-economic uses.	Provincial departments (MEC)
Coastal planning schemes	ICMA	National Department Environment Municipalities
Special management areas	ICMA	National Department Environment
Buffers for sensitive areas	NEMA Regulations (2010) requires a 32m zone around certain sensitive areas where construction or expansion of facilities within buffer zone triggers environmental assessment before continuing.	Provincial departments (MEC)
SDFs, land use plans and zoning schemes	MSA	Municipalities
	SPLUMA	
	Provincial Planning and Development Acts	

A powerful, pro-active manner in which to promote sustainable use of estuaries is to set norms and standards that specify the **conditions of use**. These may, for example be stipulated in acts, regulations or protocols. Furthermore, plans and guidelines can also be put forward to encourage best practice that recommends best practice conditions of use. Several norms and standards, as well as guidelines, have been issued by government either stipulating condition of use in the coastal zone, in general, as well as for specific uses. Important national norms and standards, as well as guidelines, expressing condition of use in the coastal zone is summarised in Table 12. Provinces and municipalities may also specify condition of use of areas within the coastal zone under their jurisdiction, provided that those specifications are aligned with these national specifications on conditions of use. Such information can be consulted to define conditions of use (e.g. target/limits) for various activities or uses in estuaries.

Table 12: National acts, regulations, protocols and gazetted notices (norms and standards), as well as national plans and guidelines expressing conditions of use potentially related to uses in estuaries

ZONE	NORM AND STANDARD/PLAN/GUIDELINE/NOTICE
Coastal public property, in general	Any natural person in the Republic - (a) has a right of reasonable access to coastal public property; and (b) is entitled to use and enjoy coastal public property, provided such use-(i) does not adversely affect the rights of members of the public to use and enjoy the coastal public property; (ii) does not hinder the State in the performance of its duty to protect the environment; and (iii) does not cause an adverse effect. (2) This section does not prevent prohibitions or restrictions on access to, or the use of, any part of coastal public property - (a) which is or forms part of a protected area; (b) to protect the environment, including biodiversity; (c) in the interests of the whole community; (d) in the interests of national security; or (e) in the national interest. The above do not apply to apply to coastal public property- (a) that has been leased; or (b) that is, or forms part of a protected area or the sea that forms part of a harbour or a proclaimed fishing harbour (Section 13 of ICM Act).
	Regulations for use of coastal public property (currently being developed by DEA)
Coastal protection zone, in general	Established for enabling the use of land that is adjacent to coastal public property or that plays a significant role in a coastal ecosystem to be managed, regulated or restricted in order to- (a) protect the ecological integrity, natural character and the economic, social and aesthetic value of coastal public property; (b) avoid increasing the effect or severity of natural hazards in the coastal zone; (c) protect people, property and economic activities from risks arising from dynamic coastal processes, including the risk of sea-level rise; (d) maintain the natural functioning of the littoral active zone; (e) maintain the productive capacity of the coastal zone by protecting the ecological integrity of the coastal environment; and (f) make land near the seashore available to organs of state and other authorized persons for - (i) performing rescue operations; or (ii) temporarily depositing objects and materials washed up by the sea or tidal waters (Section 17 of ICM Act).
Estuaries, in general	Reserve and Resource Quality Objectives (as per Methods to determine the Ecological Flow requirements for Estuaries as required under the NWA) (i.e. defining the ecological condition and ecological flow requirements)
Protected areas	Provincial conservation plans
	National Protected Area Expansion Strategy (SA Government 2008)
	National Estuary Biodiversity Plan proposed as part of NBA 2011 (Turpie et al., 2012)
	Norms and standards, plans, guidelines and policies issued for South African National Parks
Transport routes	Off-road Vehicle Regulation Guidelines to assist with the implementation of the Off-road Vehicle (under NEMA) (2004)
Effluent discharges	National policy for coastal effluent discharges from land-based sources (ICM Act)
	Conditions of use as set out in coastal waters discharge permits (ICM Act)
Fisheries	MLRA Regulations (1998) (Government Notice R1111 in Government Gazette 19205 of 2 Sept 1998 - as amended).
	Policy for the small scale fisheries sector in South Africa (Government Gazette 35455, Notice No. 474, 20 June 2012).
	Various policies for the allocation and management of commercial fishing rights (http://www.nda.agric.za/)
Solid waste disposal	National Norms and standards for disposal of waste to land fill (Government Notices No. 36784. No R 636 of 23 August 2013)
Marine aquaculture	MLRA Regulations (1998) (Government Notice R1111 in Government Gazette 19205 of 2 September 1998 - as amended)
	Policy for the development of a sustainable marine aquaculture sector in South Africa (Notice 1109 of 2007) aimed at creating an enabling environment that will promote the growth of marine aquaculture in South Africa and enhance the industry's contribution to economic growth and to support and develop regulatory and management mechanisms aimed at avoiding or minimizing adverse environmental impacts
	Strategic environmental assessment to define Marine Aquaculture Development zones in South Africa (prepared by DAFF in collaboration with DEA: Oceans and Coasts) (DAFF, 2011)
	Guidelines for Marine Finfish Farming in South Africa This document provides guidelines for finfish farming, including land-based farming (DAFF, 2012a)
	Guidelines for Aquaculture Better Management Practices in South Africa (DAFF, 2012b)
Ports	Draft Port Rules and Harbour Master's Written Instructions to replace Harbour Regulations (www.info.gov.za/gazette/notices/2007/30253d.pdf)
	Marine Traffic Regulations (1981) (under Marine Traffic Act)

ZONE	NORM AND STANDARD/PLAN/GUIDELINE/NOTICE
	National action list for the screening of dredge material proposed for marine disposal (DEA, 2012a).
Mining	MPRD Act Regulations (2004) specifying the procedures to follow and the content in the preparation of EIA,'s, EMPlans and EMProgrammes, as well as PARs. Pollution control and waste management is also addressed (www.info.gov.za/gazette/regulation/2004/26275.pdf).
	Financial provision guidelines (2005) developed in terms of the MPRD Act and the MPRD Act Regulations (www.aspasa.co.za/PDFs/DMR-guidelines-quantam.pdf)
	Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector (DEA, DMR, Chamber of Mines, South African Mining and Biodiversity Forum & SANBI, 2013)
Infrastructure development	Building Regulations and Standards prepared by the South African Bureau of Standards (SABS) setting standards for the technical performance for all buildings constructed in South Africa, mainly to ensure the health and safety of occupants (https://www.sabs.co.za/)
	Provincial planning legislation and SDFs
	Municipal IDPs and SDF, as well as related by-laws
Recreation	Water quality guidelines for the coastal environment: Recreational use (DEA, 2012b)
Boating	Merchant Shipping Act 51 0f 1957, controlling shipping and boating in South Africa by the South African Maritime Safety Authority (SAMSA) Merchant Shipping (Small Vessel Safety) Regulations 2007: This set of regulations is the latest version of the small vessel regulations and includes the 2008 amendments. (http://www.samsa.org.za/content/acts-and-regulations)

A useful manner in which to summarise information related to the zonation of activities in the management plan - together with the proposed zonation map - is illustrated in Table 13.

Table 13: Example of Zonation of Activity summary for inclusion in Estuarine Management Plan

ZONATION/USE	CONDITION OF USE	RELEVANT LEGISLATION	RESPONSIBLE AUTHORITY TO CONSULT	RESPONSIBLE AUTHORITY TO ENFORCE
Recreation: Swimming	Compliance with WQ guidelines for recreational use	Health Act	Metropolitan/ District Municipality	Metropolitan/ District Municipality
Fishing: Bait collection	Compliance with species bag limits and gear restrictions	MLRA Regulations	DAFF	DAFF compliance officers/ provincial nature conservation agencies
Protected Areas	Compliance with protected areas management plan stipulations and zonation	NEM:PAA	DEA	SANParks/ provincial nature conservation agencies
……				

In preparing the zonation maps for estuaries, it is required that management authorities use appropriate terminology in the description of zones in the estuary. As most EMPs must be aligned with other (municipal) spatial planning schemes (e.g. Spatial Development Frameworks and Land Use Schemes) or National and provincial Park plans, it is only logical that the terminology to be applied in estuarine zonation matches that stipulated for those plans and schemes. The new **Spatial and Land Use Management Act (No. 16 of 2013)** (SPLUMA), provides the framework for spatial planning and land use management in South Africa. This act is administered by the Department responsible for Rural Development and Land Reform. Regulations under SPLUMA will be providing uniform zoning categories for land use schemes that should also be consulted once the regulations are promulgated. Background information on various zonation terminology is provided in Appendix C.

3.8 Integrated Monitoring Plan

In the context of estuarine management planning for individual estuaries, an integrated monitoring plan should comprise three broad categories, namely:

- **Resource monitoring**, which is directed at specific ecological indicators (to monitoring the state or health of the natural resource – in this case the estuary as defined by the EFZ)
- **Compliance monitoring**, which relates to the intensity and character of activities/uses of the resource so as to test compliance with relevant laws and policies, as well as timeously identify potential threats
- **Performance monitoring,** which is aimed at gauging progress in terms of achieving the management objectives, and ultimately, the vision (and associated outcomes) for a particular estuary.

Figure 7 schematically illustrates important, generic elements characteristic of an environmental monitoring plan. These elements are discussed in greater detail below for each of the above components.

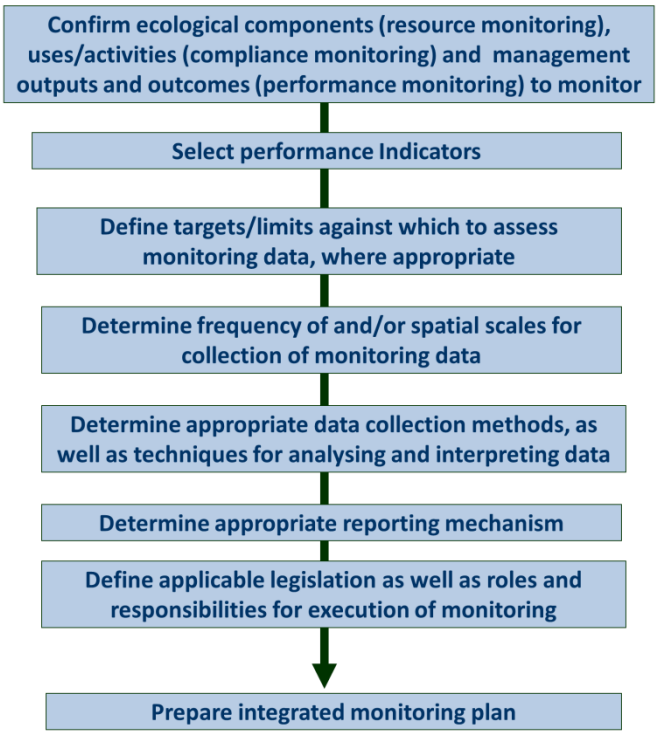


Figure 7: Key elements of an integrated monitoring plan for estuarine management

The primary aim of **resource monitoring** is to collect and evaluate data that will inform management on the ecological health of an estuary, as well as the intensity and nature of uses/activities that potentially influence its health state. Requirements for the ecological monitoring of estuaries as described in the *Methods for the Determination of the Ecological Water Requirements Reserve for estuaries* (DWA 2013 or future updates thereof) provides a suitable guideline for the ecological health component. The EWR method provides guidance on the selection of abiotic and biotic components to consider in resource monitoring programmes, as well as spatial and temporal scales at which these should be conducted. For

estuaries where Resource Quality Objectives (ROQs) have been specified, as part of the Water Resource Classification or the Ecological Water Requirement process (under the National Water Act), such RQOs provide the targets or 'thresholds of potential' concern against which to assess ecological health. A useful reporting mechanism for resource monitoring (i.e. estuarine health state and characterisation of potential pressures/impacts) is State of Coast Reporting. The mechanism of reporting need not be expensive and management authorities can chose a communication route that will best suit their situation. Examples include publications, websites, stakeholder presentations, etc. The monitoring plan should provide recommendations on suitable reporting mechanisms suitable to a specific estuary.

Compliance monitoring primarily comprises the monitoring of intensity and character of uses/activities in an estuary. Such monitoring is usually specified in relevant laws, regulations, policies, standards, guidelines and/or permits and licence agreements. Also, the selection of uses/activities will be informed by related information gathered during the Situation Assessment. The aim of this monitoring component is to test for compliance as well as to assess timeously for potential pressures on the resource. The indicators (or monitoring parameter/s) for various activities/uses usually are specified in relevant statutes as listed above. Often these statutes also specify frequency of sampling/monitoring, but the frequency of monitoring typically depends on the variability of activity/use (e.g. seasonal or throughout the year; variability in flow rates and effluent composition). Reporting mechanism for compliance monitoring is mostly stipulated in the laws and policies governing various uses/activities in and around estuaries and such information should be sourced for the uses/activities relevant to a particular estuary, and included in the integrated monitoring plan.

Performance monitoring is primarily aimed at assessing the effectiveness with which planned management activities are being performed (outputs), and ultimately, to gauge progress in achieving the vision and objectives (outcomes). For this component of the integrated monitoring plan, it is therefore important to verify the selection of 'outputs' and 'outcomes' that will be included. These will be based on the Vision and Objectives (see Section 4.4), as well as the Recommended Management Priorities (see Section 4.6). The performance indicators defined for those components now come to use. Ideally, targets should also be set for each of the performance indicators. Most important for performance monitoring is temporal scales at which data on the selected indicators should be collected. This will obviously depend on the type of indicator and expected rate of progress. Performance reporting is (or should be) addressed in key performance assessments of various departments in terms of, for examples requirement under NEMA (requiring reporting on management of environmental matters). Again, the proposed reporting mechanisms for a particular estuary should be proposed in the integrated monitoring plan.

The above information should be presented in an integrated monitoring plan in the EMP. Also to be included is the relevant legislation, where appropriate, as well as authorities responsible for the implementation (or responsible for enforcing implementation) of the various components in the integrated monitoring plan.

A useful manner to summarise the integrated monitoring plan in the EMP is presented in Table 14.

Table 14: Example of Integrated monitoring plan summary for inclusion in Estuarine Management Plan

Resource monitoring:

ECOLOGICAL COMPONENT	INDICATOR	SPATIAL/ TEMPORAL SCALES	TARGET (e.g. RQOs)	RELEVANT LEGISLATION	RESPONSIBLE AUTHORITY

Compliance monitoring:

USE/ACTIVITY	INDICATOR	TEMPORAL SCALE	TARGET/LIMIT	RELEVANT LEGISLATION	RESPONSIBLE AUTHORITY

Performance monitoring:

MANAGEMENT OUTPUT (linked to Management Priorities)	PERFORMANCE INDICATOR	TEMPORAL SCALE	TARGET	RELEVANT LEGISLATION	RESPONSIBLE AUTHORITY

OUTCOME (linked to vision)	PERFORMANCE INDICATOR	TARGET

Summarising the monitoring plan in this way, will enable the estuarine management authority to easily extract monitoring components related to a specific Responsible Authority and communicate these to the respective government department/s for their consideration and approval during the Implementation phase.

An aspect that is not directly addressed in the Protocol, but which can be critical from an environmental impact point of view is **mouth breaching plans and emergency or disaster response plan**, e.g. in the case of a sewage or oil spill. This can take form of a simple organogram of institutions to be contacted in various types of emergencies, as well as contact persons and contact numbers. Such plans can draw on related planning done by the local municipality.

3.9 Institutional Capacity and Arrangements

Effective institutional structures and arrangements are crucial support elements for the successful implementation and coordination of activities as set out in the EMP. In this light the Protocol requires that the EMP includes details on the institutional capacity and arrangements that will be required for managing the various elements of the EMP, taking into account different departmental mandates.

Chapter 5 of the ICM Act provides direction on institutional arrangements that would contribute to cooperative coastal governance in South Africa. According to the ICM Act, the embodiment of cooperative coastal governance is vested in coastal committees that are established at national, provincial and municipal levels. The Protocol does not propose new institutional arrangements specifically aimed at estuarine management. Rather the Protocol states that **provincial and municipal coastal committees** shall serve as the forums for monitoring the implementation of EMPs and reporting of progress and achievements related to EMPs. While coastal committees are suitable forums for monitoring the implementation of EMPs and reporting on progress and achievements related to these plans, successful implementation and coordination of management activities do require detailed technical coordination and cooperation amongst responsible authorities and other key role players. In the above context, it remains crucial that the estuarine management authorities provide specific details on the institutional arrangements that they propose, specifically dealing with the technical cooperation and coordination in estuarine management.

An institutional model that can be considered for stronger technical coordination and cooperation is the **National Estuaries Management Sub-Committee** (an advisory body to **Working Group 8)**. This Working Group provides government authorities (and other key role players) with management responsibilities, the opportunity to coordinate activities and to address disputes or uncertainties that may arise during implementation. Also, it provides a platform through which to optimise the use of limited resources in the execution of the management actions as set out in the EMP. When addressing details on these institutional arrangements for a specific estuary, it is also critical that capacity constraints (both in terms of capacity and skills) be highlighted and that proposed solutions to address those constraints are explored.

Continuous stakeholder engagement will remain critical even during the Implementation phase of the EMP as local stakeholders fulfil the important role of being watchdogs or custodians. The Protocol recognizes existing **estuary forums** (e.g. as has been established under the CAPE Estuaries Programme). These are regarded as informal advisory bodies towards the effective facilitation and implementation of project plans (to be developed as part of the Implementation Phase). Also, they foster continuous stakeholder engagement. It is strongly recommended that the management authority considers the continuation or establishment of an advisory stakeholder body in their area to fulfil the above role in the spirit of participatory, cooperative governance promoted by NEMA and the ICM Act.

4 Implementation Phase

4.1 Project Plans for Implementation

Following a consultative EMP process a series of recommended Management Priorities - to be undertaken during a 5-year planning cycle – is provided (see Objective setting phase). However, the mandate and responsibility to execute the recommended Management Priorities do not necessarily fall within the jurisdiction of the ICM Act and/or the Management Authority alone. It is therefore crucial that the Management Authority, once the EMP has been approved and adopted, continue engagement with other departments or role players to facilitate effective implementation. Here early consultation (and collaboration) with other key management authorities and role players - from the Scoping phase – will contribute greatly to departments timeously embedding estuarine management priorities in departmental resource planning strategies and operational plans.

This should be achieved through official communications between the Management Authority and heads of relevant departments with jurisdiction in estuaries and that have to execute actions listed as recommended Management Priorities. Were possible, responsible departments should use existing formal management and/or review structures (e.g. Fisheries Working Groups, Coastal Committees, Catchment Management Agencies) to provide guidance in terms of formally evaluating and recommending how the proposed actions can be incorporated in departmental/sector strategies and operational plans.

4.2 Development of Project Plans

To facilitate effective implementation, detailed project plans must be prepared for priority actions adopted into departmental implementation strategies. Also important is the preparation of **contingency plans** that stipulate the procedures to be followed in emergency or hazardous situation, such as oils spills, sewage spills and flooding hazards. **Mouth management plan**, stipulating the procedure for artificial breaching of estuaries (where relevant) should also be considered. Another important aspect to consider in the development of project plans is projects related to the **finalisation of the zonation plan**. These plans typically will include the following information (after IUCN, 2003):

- Specific requirements stipulated in policy and legislation;
- Specific methods, protocols and best practice-guides to assist with implementation;
- Spatial planning and conditions of use that need to complied with (these should be extracted from situational analysis or relevant documentation);
- A detailed work plan identifying different tasks;
- Responsibilities for the different tasks;
- Scheduling of task, indicating start and finish dates;
- Interim milestones and associated interim performance indicators;

- Monitoring and reporting plan to verify the effectiveness of the implementation process and to assess compliance with the related management objective and, ultimately the vision;
- Human resource plan, for implementation indicating specific service providers, where relevant; and
- Financial resource plan.

An example template for Project Plans is provided in Appendix D

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5 Approval and Review Process

5.1 Approval of Situation Assessment

The Situation Assessment Report does not go through an official (formal) approval process, but it is important that the Report is accepted by the responsible authorities and key stakeholders, as presented to them toward the end of the Scoping phase (see Figure 4). Approval by responsible authorities and stakeholders should be documented in the Proceedings of the last Stakeholder meeting in the Scoping phase.

5.2 Approval of Estuarine Management Plan

The Protocol is clear on the official approval process that must be followed for an EMP as is summarised in Figure 8.

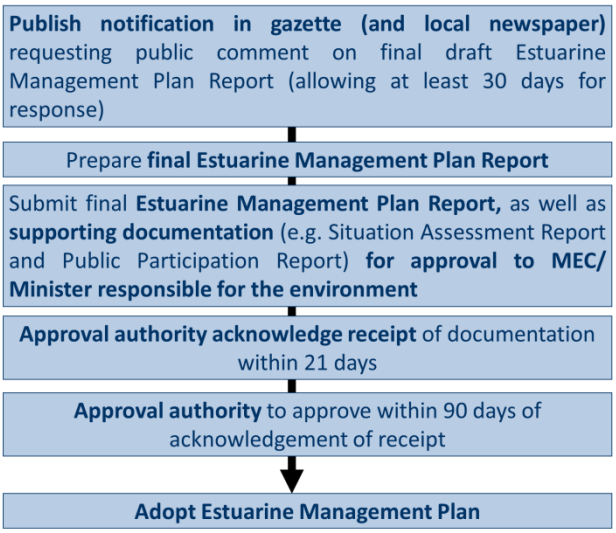


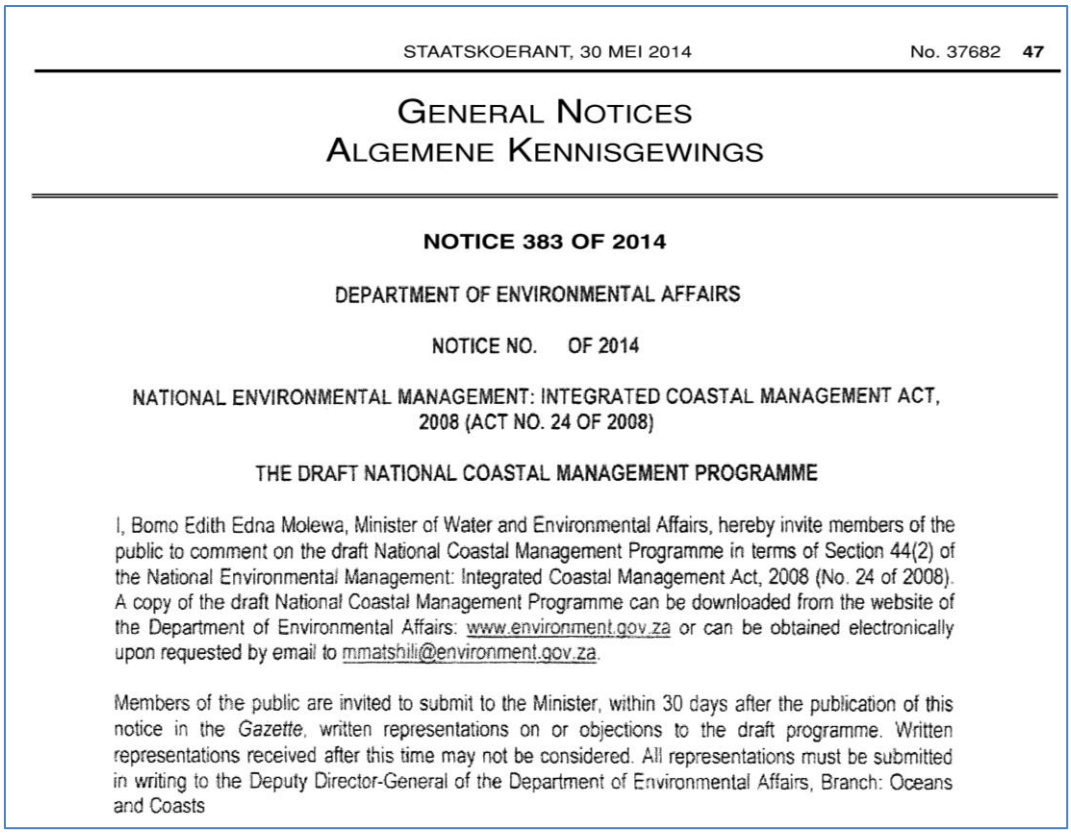
Figure 8: Approval process for Estuarine Management Plan

The Protocol and ICM Act requires the responsible management authority to publish a notification in the Gazette requesting public comments on a final draft EMP. For plans developed by national government the national gazette should be used, and the provincial gazette for plans developed by provincial and municipal authorities. The notification must provide clear direction on where a copy of the Plan can be obtained (see the example used in the gazetting of the National Coastal Management Programme for public comment - Figure 9).

The Protocol allocates approval powers of EMPs to either **MECs** of coastal provinces or the **Minister** responsible for environmental affairs as summarised in Table 15. An example of a review template for EMPs is provided in Appendix E.

Table 15: Approval authorities for individual estuarine management plan

APPROVAL AUTHORITY	LOCATION OF ESTUARY
Member of the Executive Council (MEC) of province responsible as designated provincial lead agency in terms of the ICM Act	Estuary falls within the boundary of a **single local or metropolitan municipality**
	Estuary falls within the **boundary of more than one local municipality**
	Estuary falls within the **boundary of more than one district municipality**
Minister responsible for Environmental Affairs	Estuary falls within a **protected area or is identified as part of a protected area expansion strategy**
	Estuary **crosses the between provinces**
	Estuary is a **harbour**
	Estuary **crosses a state boundary**



STAATSKOERANT, 30 MEI 2014 No. 37682 47

GENERAL NOTICES
ALGEMENE KENNISGEWINGS

NOTICE 383 OF 2014

DEPARTMENT OF ENVIRONMENTAL AFFAIRS

NOTICE NO. OF 2014

NATIONAL ENVIRONMENTAL MANAGEMENT: INTEGRATED COASTAL MANAGEMENT ACT, 2008 (ACT NO. 24 OF 2008)

THE DRAFT NATIONAL COASTAL MANAGEMENT PROGRAMME

I, Bomo Edith Edna Molewa, Minister of Water and Environmental Affairs, hereby invite members of the public to comment on the draft National Coastal Management Programme in terms of Section 44(2) of the National Environmental Management: Integrated Coastal Management Act, 2008 (No. 24 of 2008). A copy of the draft National Coastal Management Programme can be downloaded from the website of the Department of Environmental Affairs: www.environment.gov.za or can be obtained electronically upon requested by email to mmatshili@environment.gov.za.

Members of the public are invited to submit to the Minister, within 30 days after the publication of this notice in the *Gazette*, written representations on or objections to the draft programme. Written representations received after this time may not be considered. All representations must be submitted in writing to the Deputy Director-General of the Department of Environmental Affairs, Branch: Oceans and Coasts

Figure 9: Example: Government gazette notification for public comments on Estuarine Management Plans

5.3 Approval for Implementation

Effective implementation of Management Priorities is reliant on the cooperation of all responsible parties. The Department of Environmental Affairs and the Responsible Management Authority will communicate with various head of departments to address Management Priorities falling within the jurisdiction of that department. This coordination will request formal acknowledgement and commitment to implement such actions. It is also important to communicate, and gain commitment on the responsibilities related to implementation of monitoring plans developed as part of the EMP. In terms of the ICM Act the Minister is required to report back in parliament on the progress of EMP implementation annually.

Note there may also be other mechanisms that can be explored to facilitate collaborative implementation of EMPs, such as Memorandums of Understanding (MoUs), Memorandums of Agreement (MoAs), Standard Operating Procedures (SOPs) or arrangements under the Intergovernmental Relations Act

5.4 Five-yearly Review

The Protocol requires that EMPs must be reviewed at least every five years after the adoption date of the plan (where possible in line with the review cycles of relevant Integrated Development Plan and Spatial Development Frameworks, as well as related Coastal Management Programmes), but may also be reviewed at any other time when considered necessary.

In essence, the review process re-enters the Scoping phase of the Estuarine Management Framework (see Figure 3) revising the earlier Situation Assessment based on information as follows:

- The effectiveness of the EMP and success with meeting the Objectives, taking into consideration information from the monitoring programmes during the preceding years (e.g. measured in terms of the performance indicators and targets)
- Environmental change (if any) at the local and wider scale that could affect the estuarine resource or the implementation of the EMP
- Changes (if any) to legislation, land-use planning, goals and policies that may require the EMP to be amended.

Based on these findings, a revision of the EMP may be required according to the proposed tasks as for the Objective Setting phase (see Figure 5), where and if appropriate. The revised/updated EMP presenting Management Priorities for the next 5-year cycle will go through an approval process (Figure 8), and feed back into another Implementation phase.

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7 Appendices

Appendix A: Proposed Content of Situation Assessment Report

Chapter 1: Introduction
- 1.1 Background
- 1.2 Purpose of Situation Assessment
- 1.3 Structure of Report

Chapter 2: Catchment Characteristics
- 2.1 Geology and geomorphology
- 2.2 Climate and runoff
- 2.3 Land-use

Chapter 3: Overview of Ecological Function and State of Estuary
- 3.1 Abiotic function (e.g. hydrodynamics, sediment dynamics and water quality)
- 3.2 Biotic function
- 3.3 Ecological health status (as per EWR study or NBA assessment)

Chapter 4: Important Good and Services (or Ecosystem Services) provided by Estuary

Chapter 5: Impacts or Potential Impacts to Estuary

Chapter 6: Overview of Socio-economic Context
- 4.1 Demographics
- 4.2 Economic profile
- 4.3 Social considerations (e.g. level/s of dependence of local communities)

Chapter 7: Legislative Instruments and related Strategies/programmes
- 5.1 Legal framework applicable to estuarine management
- 5.1 Management strategies/plans relevant to estuary
- 5.3 Existing monitoring programmes

Chapter 8: Opportunities and Constraints for consideration in EMP

Chapter 9: Recommendations to address Major Information Gaps (relevant to EMP process)

Appendix B: Proposed Content of Estuarine Management Plan

Chapter 1: Introduction
- 1.1 Background
- 1.2 Purpose of Estuarine Management Plan
- 1.3 Structure of Report

Chapter 2: Synopsis of Situation Assessment
- 2.1 Present ecological state, as well as desired ecological state
- 2.2 Good and services or human use activities (Ecosystem Services)
- 2.3 Impacts or potential impacts
- 2.4 Geographical socio-economic context
- 2.5 Opportunities and constraints
- 2.6 Major information gaps to be addressed in plan.

Chapter 3: Geographical Boundaries of Estuary

Chapter 4: Local Vision and Objectives

Chapter 5: Management Objectives and Associated Activities

Chapter 6: Proposed Zonation of Activities

Chapter 7: Recommended Management Priorities

Chapter 8: Integrated Monitoring Plan

Chapter 9: Institutional Capacity and Arrangements

Appendix C: Terminology for Zonation of Activities

The following land uses purposes (or zonation type) are stipulated in the Spatial Planning and Land Use Management Act (No 16 of 2013).

PURPOSE (ZONATION)	DEFINITION
Agricultural	Associated with the use of land for agricultural activities, including the use of land for structures, buildings and dwelling units reasonably necessary for or related to the use of the land for agricultural activities
Business	Associated with the use of land for business activities, including shops, offices, showrooms, restaurants or similar businesses other than places of instruction, public garages, builder's yards, scrap yards and industrial activities
Commercial	Associated with the use of land for distribution centres, wholesale trade, storage warehouses, carriage and transport services, laboratories or computer centres, including offices and other facilities that are subordinate and complementary to such use
Community	Associated with the use of land for cultural activities, social meetings, gatherings, non-residential clubs, gymnasiums, sport clubs or recreational or other activities where the primary aim is not profit-seeking, excluding a place of amusement
Conservation	Associated with the use of land for the preservation or protection of the natural or built environment, including the preservation or protection of the physical, ecological, cultural or historical characteristics of land against undesirable change or human activity
Educational	Associated with the use of land primarily for instruction or teaching purposes, including crèches, schools, lecture halls, monasteries, public libraries, art galleries, museums, colleges and universities
Government	Associated with the use of land by the national government, a provincial government or a municipality to give effect to its governance role
Industrial	Associated with the use of land for the manufacture, altering, repairing, assembling or processing of a product, or the dismantling or breaking up of a product, or the processing of raw materials, including a noxious activity
Institutional	Associated with the use of land for charitable institutions, hospitals, nursing homes, old-age homes, clinics and sanatoriums, either public or private
Mining	Associated with the use of land for mining
Public	Associated with the use of land as open spaces, public parks, public gardens, recreation sites, sport fields or public squares or for religious gatherings
Recreation	Associated with the use of land primarily for recreation, including entertainment, leisure, sports and amusement facilities
Residential	Associated with the use of land primarily for human habitation, including a dwelling house, group housing, hotels, flats, boarding houses, residential clubs, hostels, residential hotels and rooms to let
Transport	Associated with the use of land primarily as a point for the pick-up or offload of people or goods, including taxi ranks, bus bays, bus stations, bus terminuses, railway stations and ancillary uses, including roads and streets
Other	Purposes that do not fall in one of the above

The SPLUMA Regulations will be stipulating uniform zonation categories for land use schemes, but this have not been published and are still to be provided (did request information from Department of Rural Development and Land Reform).

Based on the above, typical purposes encountered in the Estuarine Functional Zone of estuaries, as well as "Other" purposes not stipulated in SPLUMA, is summarised below. Specifically, the sub-division of various zonation categories is also provided. These sub-division were derived from terminology applied in marine protected areas and/or National Parks (as indicated). Where no appropriate terminology was available for South Africa, estuary specific terminology is proposed *(indicated in italics):*

PRIMARY ZONATION	SUB CATEGORIES		SOURCE/S
	Description	Terminology	
Agriculture	Field crops, dry land	To be sourced	SPLUMA Regulations
	Field crops, irrigated	To be sourced	SPLUMA Regulations
	Beef cattle or livestock grazing	To be sourced	SPLUMA Regulations
	Beef cattle or livestock feed lot, or stockyard, auction, or sales yard	To be sourced	SPLUMA Regulations
	Dairy	To be sourced	SPLUMA Regulations
	Subsistence Agriculture	To be sourced	SPLUMA Regulations
	Forestry	To be sourced	SPLUMA Regulations
	Cattle exclusion zone	***Cattle exclusion zone***	
Conservation	Marine Protected Areas	**Marine Protected Area**	NEM:PAA
	Protected Areas (terrestrial)	**Protected Area**	NEM:PAA
	National Parks	**National Park**	NEM:PAA
	Nature Reserves	**Nature Reserve**	NEM:PAA
Industrial	Areas used for industrial purposes	**Industrial zone**	SPLUMA Regulations
Mining	Areas used for mining	**Mining**	SPLUMA Regulations
Public	Open spaces, public parks, public gardens, recreation sites, sport fields or public squares or for religious gatherings	To be sourced	SPLUMA Regulations
	Public access (e.g. parking areas, board walks etc.)	To be sourced	SPLUMA Regulations
Residential	Houses	To be sourced	SPLUMA Regulations
	Hotels and resorts	To be sourced	SPLUMA Regulations
Recreational activities	Swimming areas in estuary	***Bathing***	
	Areas where kite surfing and wind surfing is be allowed (e.g. outside ecological sensitive areas)	***Kite surfing*** ***Wind surfing***	
	Snorkelling	***Snorkelling***	
	Areas for water skiing	***Ski zone***	
Transport	Road	**Road**	SPLUMA Regulations
	Railway	**Railway**	SPLUMA Regulations
	Bridge	**Bridge**	SPLUMA Regulations
	Recreational or subsistence fishing	**Fishing**	MLRA Regulations
	Spear fishing	**Spear fishing**	MLRA Regulations
	Bait collection by means of approved gear	**Bait collection**	MLRA Regulations
	No-take fishing zone	**No fishing zone**	MLRA Regulations
	No-take bait collection zone	**No bait collection**	MLRA Regulations
	Aquaculture (oyster rafts)	**Aquaculture**	MLRA Regulations
Boating ('other')	Speed restriction or engine (horse power) restrictions in high use areas	***Speed restriction zone (e.g. 10 km/h zone)***	
	Wake restriction in highly erodible areas	***No wake zone***	
	Boat restriction	***No boating***	
	Boat launching site, parking areas, ablution facilities	***Public boat launching site***	
	Sailing, canoeing no motorised power etc.	***No power boating***	

PRIMARY ZONATION	SUB CATEGORIES		SOURCE/S
Infrastructure ('other')	Wastewater treatment works	To be sourced	SPLUMA Regulations
	Sewage pump station	To be sourced	SPLUMA Regulations
	Reservoirs, dams and weirs	To be sourced	SPLUMA Regulations
	Water supply pipelines	To be sourced	SPLUMA Regulations

Estuaries with a large number of uses, or a high degree of user conflict may require quite detailed Estuary Zonation Maps to ensure clear communication and compliance. While, for estuaries, or a group of estuaries, where there is not significant conflict in use, or where the system(s) fall within the same management area (e.g. SANParks or municipality); it may be possible to reduce zonation complexity by grouping activities into appropriate collective groups. An example of this approach is Ezemvelo KZN Wildlife zonation for marine and estuary protected areas below:

PERMISSIBLE USES & ACTIVITIES	NON-PERMISSIBLE USES & ACTIVITIES
WILDERNESS ZONE	
✓ Highly regulated scientific research and monitoring. ✓ Minimum required law enforcement patrol and reaction on foot, with vehicular use only in emergencies ✓ Guided wilderness trails (only walking on beaches ,and swimming)	× All forms of extractive use, including harvesting of intertidal or shallow subtidal organisms, collection of biota, marine products (shells) and rocks/sand. × Fossil and shell collecting × Surfing, surf-skiing, snorkelling, rock and surf angling, or use of jetskis × Vehicles on beaches, including management
SANCTUARY ZONE	
✓ Research and monitoring ✓ Guided educational tours on foot ✓ Scientific and monitoring research beach driving ✓ Walking on beaches and swimming ✓ Limited traditional subsistence resource harvesting and use by local communities under strict regulation and control ✓ Essential management activities	× Harvesting of intertidal or shallow subtidal organisms, excluding subsistence fishing in demarcated areas × Fossil and shell collecting × Launching of boats × Walking on intertidal rocks × Riding of bikes × Horse-riding × Surfing, surf-skiing, snorkelling, rock and surf angling, or use of jetskis
RESTRICTED: LOW USE ZONE	
✓ Educational tours (non extractive, e.g. turtle). ✓ Research and monitoring ✓ Walking on beaches and rocks ✓ Recreational rock and surf angling (catch and release only) ✓ Subsistence invertebrate harvesting (with closed areas) Fossil collecting (i.e. non-extractive) ✓ Swimming, snorkelling, surfing, surf-skiing, kite and wind surfing ✓ Concession-based driving in designated areas.	× Vehicles on the beach × Extractive recreational fishing × Use of jetskis.
CONTROLLED: MODERATE USE ZONE	
✓ Recreational rock & surf angling (according to a fish list). ✓ Recreational spearfishing (according to fish list). ✓ Recreational invertebrate harvesting ✓ Subsistence invertebrate harvesting ✓ Horse-riding ✓ Walking on beaches & rocks ✓ Swimming, snorkelling, surfing & surf-skiing ✓ Educational tours (e.g. turtle) ✓ Research and monitoring ✓ Concession-based beach driving. ✓ Special events.	× Inshore harvesting of intertidal organisms. × Keeping fish not on the “fish list”

Appendix D: Proposed Template for Project Plans

<table>
<tr><td>ACTION</td><td>Describe the action to be undertaken</td></tr>
<tr><td>COMPLETION DATE</td><td>Provide date of expected completion</td></tr>
<tr><td>PERFORMANCE INDICATOR</td><td></td></tr>
<tr><td>Requirements stipulated in policy and legislation</td><td></td></tr>
<tr><td>Available methods, protocols and best practice-guides</td><td></td></tr>
<tr><td>Spatial zonation consideration (e.g. limits/targets)</td><td></td></tr>
<tr><td>Detailed work plan</td><td>Task 1:
Task 2:
Task 3:
Task 4:</td></tr>
<tr><td>Scheduling</td><td>
<table>
<tr><th rowspan="2">TASK</th><th colspan="9">TIME (months)</th></tr>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th></tr>
<tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
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</td></tr>
<tr><td>Milestone/interim performance indicator</td><td>
<table>
<tr><th>MILESTONE</th><th>INTERIM PERFORMANCE INDICATOR</th><th>DUE DATE</th></tr>
<tr><td>1</td><td></td><td></td></tr>
<tr><td>2</td><td></td><td></td></tr>
<tr><td>3</td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Responsibilities for different tasks</td><td>E.g. Identify specific departments, personnel and/or service providers responsible for execution of this action</td></tr>
<tr><td>Monitoring and reporting plan</td><td>E.g.
• Define data and information to measure in order to monitor performance indicator/s
• Specify frequency at which data/information should be collected/monitored
• Where and when to report on progress</td></tr>
<tr><td>Human resource plan</td><td>
<table>
<tr><th rowspan="2">HUMAN RESOURCE</th><th colspan="4">WEEKS PER TASK</th></tr>
<tr><th>1</th><th>2</th><th>4</th><th>4</th></tr>
<tr><td>Staff member 1</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Staff Member 2</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Service provider</td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Financial resource plan</td><td>
<table>
<tr><th>TASK</th><th>COST (ZAR)</th></tr>
<tr><td>1</td><td></td></tr>
<tr><td>2</td><td></td></tr>
<tr><td>3</td><td></td></tr>
<tr><td>4</td><td></td></tr>
<tr><td>TOTAL</td><td></td></tr>
</table>
</td></tr>
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Appendix E: Proposed Template for EMP reviews

The review criteria comprise three components which draw on requirements in the Protocol, namely:

1. Participation Process during development of Estuary Management Plan
2. Situation Assessment Report
3. Estuary Management Plan

The scoring system (status) applied in the criteria is as follows:

YES	Requirements met sufficiently
MOSTLY	Minor changes required
PARTLY	Moderate/significant changes required
NO	Most requirements not met major - changes required

ESTUARY	
MANAGEMENT AUTHORITY	
CONSULTANT (if applicable)	
DATE OF DOCUMENTS REVIEWED	

Estuarine Management Plan approved?	**YES, no revisions**	
	YES, with minor revisions	
	YES, pending major revisions	
	NO, re-work required	
DETAILS ON REVISION:		

1. Participation process followed in Scoping and Objective setting phases

ASPECT	STATUS	RECOMMENDED AMENDMENTS
Appropriate participation process was followed, i.e. relevant stakeholders and authorities participated (i.e. proceedings documented as per Guidelines		
Situation Assessment: Effectively communicated to ensure informed decision-making as per Guidelines		
Vision and Objectives: Proper consultation was followed as per Guidelines		
Management Objectives and Activities: Developed in consultation with responsible authorities of key sectors (i.e. sector lead agents) as per Guidelines		

2. Situation Assessment Report (Scoping phase)

ASPECT	STATUS	RECOMMENDED AMENDMENTS
Ecological functioning and state described, including underlying processes and drivers		
Information from **Ecological Water Requirement (EWR) Study** information included (if available)		
Socio-economic context provided		
Opportunities and constraints addressed		
Goods and services described		
Human activities and their impacts or potential impacts addressed		
Legislation and existing/planned management strategies/plans addressed		

3. Estuarine Management Plan

ASPECT	STATUS	RECOMMENDED AMENDMENTS
Executive summary of Situation Assessment included (see requirements above)		
Map of estuary based on Estuarine Functional Zone provided (http://bgis.sanbi.org)		
Vision and objectives provided, considering Protocol strategic vision and objectives, as well as national, provincial and municipal CMPs, where applicable		
Management objectives and activities have been identified for all relevant sectors (important to link to existing management initiatives). **Management priorities** have been proposed (indicating relevant legislation and authority to enact relevant laws to implement proposed management priority)		
Intended **spatial zonation of estuary** provided, including authority to be consulted (based on type of zonation) and authority to enact relevant laws to implement proposed zonation		
Performance indicators (linked to objectives) in to gauge progress		
Integrated monitoring plan provided, considering resource monitoring, compliance monitoring, as well as performance monitoring,		
Description of **institutional capacity and arrangements** to manage elements of EMP.		