

INTEGRATED
ENVIRONMENTAL
MANAGEMENT
SERIES

**ENVIRONMENTAL BEST PRACTICE
GUIDELINES:
DECOMMISSIONING PLANNING**

For Water Supply and Water Resource Infrastructure

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DOCUMENT INDEX

Reports as part of the IEM Series

| Report number | Report title |
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| IEMS 1.1 | Administration and User Manual of the IEMS |
| IEMS 1.2 | Environmental Policy and Strategy |
| IEMS 1.3 | Consolidated Environmental Implementation and Management Plan |
| IEMS 1.4 | Integrated Environmental management Framework |
| IEMS 1.5 | Environmental decision Support System |
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| IEMS 1.8 | Environmental Reporting |
| IEMS 1.9 | Sustainable Development Management System |
| IEMS 1.10 | Environmental legal Guide Booklet |

APPROVAL

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DEFINITIONS

| | |
|-------------------------|---|
| Aerobic: | Having molecular oxygen (O ₂) present. |
| Anaerobic: | Not having molecular oxygen (O ₂) present. |
| Auditing: | A systematic and objective assessment of an organisation's activities and services conducted and documented on a periodic basis. |
| Biodiversity: | The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found. |
| Blacklist: | Record of previous failures to perform or deliver. |
| Capillary fringe: | The zone just above the water table that remains almost saturated. This varies from approximately 10 cm in sandy soils to about 30 cm in some clay soils. |
| Catchment: | All the land area from mountaintop to seashore which is drained by a single river and its tributaries. |
| Coastal wetlands: | Wetlands influenced by tides and contain waters that show appreciable salinity. |
| Debushing: | Clearing of the site of bush and undergrowth vegetation, but not including the removal of tree stumps. |
| Designed landscape: | An evocative, meaningful, and sustainable totality that evolves over time in response to a wide range of diverse influences. |
| Destumping: | The removal of tree stumps. |
| Environment: | A place where living, non-living and man-made features interact, and where life and diversity is sustained over time. |
| Evaporation: | The change by which any substance (such as water) is converted from a liquid state into and carried off in vapour. |
| Floodplain: | A flat expanse of land bordering a river channel, formed through sediment deposition and other alluvial processes, and often characterized by frequent flooding as a result of bank overspill from the river channel. |
| Groundwater: | Subsurface water in the zone in which permeable rocks, and often the overlying soil, are saturated under pressure equal to or greater than atmospheric. |
| Inland wetlands: | Fresh water (non-tidal) wetlands that can often be likened to a basin filled with soil which has an impervious layer that retains water. |
| Landscape: | Land modified for human use and occupation, embracing both the natural (wilderness) environment and the urban. |
| Landscape architecture: | The science, art and technique of planning and design of integrated man-made and natural elements and spaces to improve the quality of life. |
| Marsh: | A wetland dominated by emergent herbaceous vegetation and which may be seasonally wet but which is usually permanently or semi-permanently flooded or saturated to the soil surface. |
| Monitoring: | A systematic and objective observation of an organisation's activities and services conducted and reported on regularly. |
| Natural vegetation: | All existing vegetation species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on the site. |

| | |
|----------------------|--|
| Open water: | Permanently or seasonally flooded areas characterized by the absence (or low abundance) of emergent plants. |
| Overburden: | The soil overlying desirable material extracted during borrowing or quarrying. |
| Pan: | An inward draining flat bottomed depression lacking an outlet usually intermittently to seasonally flooded. |
| Peat: | Organic soil material with a particularly high organic matter content which, depending on the definition, usually has at least 20% organic carbon by weight. |
| Pollution: | The result of the release into air, water or soil from any process or of any substance, which is capable of causing harm to man or other living organisms supported by the environment. |
| Protected Plants: | Plant species officially listed on the Protected Plants List (each province has one), and which may not be removed or transported without a permit to do so from the relevant provincial authority. |
| Red Data Species: | Plant and animal species officially listed in the Red Data Lists as being rare, endangered or threatened. |
| Rehabilitation: | Making the land useful again after a disturbance. It involves the recovery of ecosystem functions and processes in a degraded habitat. Rehabilitation does not necessarily reestablish the pre-disturbance condition, but does involve establishing geological and hydrologically stable landscapes that support the natural ecosystem mosaic. |
| Riparian vegetation: | Vegetation occurring on the banks of a river or a stream (i.e. vegetation fringing a water body). |
| Runoff: | The total water yield from a catchment including surface and subsurface flow. |
| Soil saturation: | The soil is considered saturated if the water table or capillary fringe reaches the soil surface. |
| Subsoil: | The soil horizons between the topsoil horizon and the underlying parent rock. |
| Swamp: | A wetland dominated by trees or shrubs. In Europe, permanently flooded reed-dominated wetlands may also be referred to as swamps. |
| Topsoil: | The upper soil profile irrespective of the fertility appearance, structure, agriculture potential, fertility and composition of the soil, usually containing organic material and which is colour specific. |
| Transplanting | The removal of plant material and replanting the same plants in another designated position. |
| Veld: | Unimproved areas of natural vegetation. |
| Watercourse: | A geomorphological feature characterized by the presence of a streamflow channel, a floodplain and a transitional upland fringe seasonally or permanently conveying surface water. |
| Watershed: | An area of land that drains water, sediment, and dissolved materials to a common outlet at some point along a stream channel. |
| Waterlogged: | Soil or land saturated with water long enough for anaerobic conditions to develop. |
| Wetland: | A seasonally, temporarily or permanently wet area, often exhibiting a specific vegetation community. |

ACRONYMS

| | |
|-------|---|
| DEAT: | Department of Environmental Affairs and Tourism |
| DE: | Design Engineer |
| DWAF: | Department of Water Affairs and Forestry |
| ECO: | Environmental Control Officer |
| EIA: | Environmental Impact Assessment |
| EM: | Environmental Manager |
| EMP: | Environmental Management Plan |
| EMS: | Environmental Management System |
| EO: | Environmental Officer |
| EP: | Environmental Planner |
| I&AP: | Interested and Affected Party |
| IEM: | Integrated Environmental Management |
| IEMF: | Integrated Environmental Management Framework |
| PM: | Project Manager |
| PSP: | Professional Service Provider |
| RoD: | Record of Decision |
| SABS: | South African Bureau of Standards |
| SE: | Site Engineer |
| SUP: | Sustainable Utilisation Plan |

APPLICABLE LEGISLATION

- Animals Protection Act (Act 71 of 1962)
- Atmospheric Pollution Prevention Act (Act 45 Of 1965)
- Conservation of Agricultural Resources Act (Act 43 of 1983)
- Constitution of the Republic of South Africa (Act 108 of 1996)
- Defence Act (Act 44 of 1957)
- Environment Conservation Act (Act No. 73 Of 1989)
- Environmental Planning Act (Act No. 88 of 1967)
- Explosives Act (Act 15 of 2003)
- Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act No. 36 of 1947)
- Forest Act (Act 122 of 1984)
- Forest and Veld Conservation Act (Act No. 13 of 1941)
- Hazardous Substances Act (Act No. 15 of 1973)
- Human Tissues Act (Act No. 65 of 1983)
- Lake Areas Development Act (Act No. 139 of 1975)
- Land Survey Act (Act No. 9 of 1921)
- Minerals And Petroleum Resources And Development Act (Act No. 28 Of 2002)
- Mountain Catchment Areas Act (Act 63 of 1970)
- National Environmental Management Act (Act No. 107 Of 1998)
- National Heritage Resources Act (Act No. 25 Of 1999)
- National Monuments Act (Act 28 of 1969)
- National Parks Act (Act 57 of 1976)
- National Resources Development Act (Act No. 51 of 1947)
- National Water Act (Act No. 36 Of 1998).
- Occupational Health And Safety Act (Act 85 Of 1993)
- Provincial and Local Government Ordinances and Bylaws
- Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925)
- Sea Birds and Seals Protection Act (Act 46 of 1973)
- Sea Fishery Act (Act 12 of 1988)
- Sea-Shore Act (Act 21 of 1935)
- Soil Conservation Act (Act No. 76 of 1969)
- Water Services Act (Act 108 of 1997)

- Ramsar Convention
- Bonn Convention

EXECUTIVE SUMMARY

This document constitutes a generic, user friendly environmental best practise manual for use during the planning phases ahead of the decommissioning of Water Supply and Water Resource Infrastructure.

Decommissioning takes place during the final phase of a project life-cycle, but a degree of environmental planning is necessary before any decommissioning activities should be allowed to commence. The reason for this is that a project earmarked for decommissioning has in all likelihood been operational for some time, and as such, the environment within which it lies has stabilised in response to the presence of the associated infrastructure, activities and facilities. The decommissioning of one or all components of such a project would therefore have an effect on the environmental status quo, either in a positive or in a negative way.

In this respect, the best practise manual contains broad brush environmental guidelines which will assist decision makers to take environmentally responsible and sustainable decisions in terms of which infrastructure to retain, which to develop further (and how to do this), and which to remove completely. In this way, the positive aspects of decommissioning may be maximised and the negative aspects minimised or even avoided. These guidelines are described in terms of:

- Biophysical Environment
 - Climate
 - Geology
 - Topography
 - Surface hydrology
 - Ground water
 - Soil
 - Flora
 - Fauna
- Aesthetic environment
- Socio-economic environment
 - Archaeological resources
 - Historical resources
 - Cultural resources
 - Air quality
 - Noise
 - Social issues
 - Land use and services
 - Tourism

Refer also to the following documents, which together with this manual comprise a complete set of environmental guidelines and performance specifications, relevant for all phases of the project lifecycle:

- *Department of Water Affairs and Forestry, February 2005. **Environmental Best Practice Guidelines: Planning**. Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.*

- *Department of Water Affairs and Forestry, February 2005. **Environmental Best Practice Specifications: Construction.** Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.*
- *Department of Water Affairs and Forestry, February 2005. **Environmental Best Practice Specifications: Operation.** Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.*

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1. INTRODUCTION

1.1 DWAF Vision

‘-We have a vision of a democratic, people-centred nation working towards human rights, social justice, equity and prosperity for all.

-We have a vision of a society in which all our people enjoy the benefits of clean water and hygienic sanitation services.

-We have a vision of water used carefully and productively for economic activities, which promote the growth, development and prosperity of the nation.

-We have a vision of a land in which our natural forests and plantations are managed in the best interests of all.

-We have a vision of a people who understand and protect our natural resources so as to make them ecologically stable and safeguard them for current and future generations.

-We have a vision of a Department that serves the public loyally, meets its responsibilities with energy and compassion and acts as a link in the chain of integrated and environmentally sustainable development.

-We have a vision of development and co-operation throughout our region of playing our part in the African Renaissance.’¹

1.2 DWAF Mission

‘The mission of the Department of Water Affairs and Forestry is to serve the people of South Africa by:

-Conserving, managing and developing our water resources and forests in a scientific and environmentally sustainable manner in order to meet the social and economic needs of South Africa, both now and in the future.

-Ensuring that water services are provided to all South Africans in an efficient cost-effective and sustainable way.

-Managing and sustaining our forests, using the best scientific practice in a participatory and sustainable manner.

-Educating the people of South Africa on ways to manage, conserve and sustain our water and forest resources.

-Co-operating with all spheres of Government in order to achieve the best and most integrated development in our country and region.

-Creating the best possible opportunities for employment, the eradication of poverty and the promotion of equity, social development and democratic governance.’²

1.3 DWAF Values

‘The Department of Water Affairs and Forestry is a loyal servant of the government and the people of South Africa.

-As public servants, our skills will, at all times, be used for the benefit of the people and for the reconstruction and development of our country in the spirit of Batho Pele (People First).

¹ National Water Act (Act 36 of 1998)

² National Water Act (Act 36 of 1998)

-As management, our responsibility is to provide high quality transformation leadership and a disciplined work ethic and to promote a working culture for motivated, accountable and committed teamwork.

-As citizens of the African continent, we are dedicated to long-term integrated regional security and co-operation, and to the spirit of the African Renaissance.

-Our working environment is governed by the principles of representivity, equality, mutual respect and human development.³

1.4 Aims of the Environmental Best Practice Guidelines and Specifications

‘To give effect to the DWAF Vision and Mission.

-To create a DWAF standard for Best Practice in Environmental Planning and Management.

-To guide all role players in Water Resource and Water Services Development Projects in terms a Best Practice standard in Environmental Planning and Management.

-To comply with the requirements of the National Water Act (Act No. 36 Of 1998), the Water Services Act (Act 108 of 1997) and the National Environmental Management Act (Act No. 107 Of 1998) as overarching legislation.’⁴

1.5 Context of this document

The function of this document is as an Environmental Planning Tool to be used during the planning phases ahead of the decommissioning of Water Supply and Water Resource Infrastructure.

1.6 Scope of this document

Although decommissioning takes place during the final phase of a project life-cycle, a degree of environmental planning is necessary before any decommissioning activities should be allowed to commence. The reason for this is that a project earmarked for decommissioning has in all likelihood been operational for some time, and as such, the environment within which it lies has stabilised in response to the presence of the associated infrastructure, activities and facilities. The decommissioning of one or all components of such a project would therefore have an effect on the environmental status quo, either in a positive or in a negative way.

In this respect, the best practise manual contains broad brush environmental guidelines which will assist decision makers to take environmentally responsible and sustainable decisions in terms of which infrastructure to retain, which to develop further (and how to do this), and which to remove completely. In this way, the positive aspects of decommissioning may be maximised and the negative aspects minimised or even avoided.

1.7 Application of this document

Ahead of decommissioning projects, sustainable environmental planning may have an impact on fundamental project decisions, such as whether or not decommissioning is the

³ National Water Act (Act 36 of 1998)

⁴ National Water Act (Act 36 of 1998)

best course of action, and if so, what actions are required and when. This may in turn have an impact on the project budget as well as project programming.

At a planning level, it is envisioned that the environmental best practise guidelines contained in this manual will empower decision makers to take environmentally responsible strategic decisions that could ultimately be of benefit to the environment and society at large.

It is important to note the following:

- Should a decommissioning plan entail a change in land use then the applicant is subject to the requirements of the Environmental Conservation Act (Act No. 73 Of 1989) and thus obliged to follow the Environmental Impact Assessment process.
- A plan for decommissioning may entail the further development of certain infrastructure, structures and buildings to accommodate the alternative uses decided upon during decommissioning planning. In such situations, the exercise ceases to be one of decommissioning, rather becoming a planning exercise and as such will be subject to all the requirements for such in terms of the Integrated Environmental Management Framework (IEMF)⁵.
- Once a Decommissioning Master Plan has been finalised (detailing future utilisation of buildings, structures, infrastructure and open space, as well as removal of redundant infrastructure), the planning phase of a decommissioning project is complete. The implementation of the Decommissioning Master Plan must then be approached as a Construction Contract, and as such will be subject to all the requirements for such in terms of the Integrated Environmental Management Framework (IEMF)⁶.

⁵ Refer to the following document for more detail in this regard: *Department of Water Affairs and Forestry, February 2005. Environmental Best Practice Guidelines: Planning. Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.*

⁶ Refer to the following document for more detail in this regard: *Department of Water Affairs and Forestry, February 2005. Environmental Best Practice Specifications: Construction. Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.*

2. ENVIRONMENTAL GUIDELINES FOR DECOMMISSIONING PLANNING

2.1 Biophysical environment

- Take note of sensitive or vulnerable terrestrial, aquatic or marine ecosystems. Ensure that a holistic view is taken of the biophysical environment and its processes, so that the impacts of decommissioning may be evaluated in proper perspective.
- Determine to what extent the impact on terrestrial, aquatic or marine ecosystems may undermine their respective ability to sustain life and productivity at an acceptable level of environmental quality, and devise an overall strategy to counter such threats.
- Compile a 'Harvesting of Natural Resources' policy where the project will entail large scale environmental change, where Special Environments are involved⁷, or where stakeholders will be affected by the project. Such a policy will address the proper preparation, harvesting, use and utilisation of:
 - Animal species (in terms of relocation);
 - Flora (in terms of firewood, medicinal plants and endangered species);
 - Useable / saleable rock, stone, sand and gravel;
 - Topsoil.

2.1.1 Climate

- Be aware of prevailing wind directions, annual rainfall (and the rainy season) and minimum and maximum temperatures.
- Take into account the presence of noxious gas emissions or bad odours when considering future uses of decommissioned buildings and structures (especially if residential uses are being considered).
- Take into account the impact of low lying areas subjected to air pollution problems or temperature inversions when considering future uses of decommissioned buildings and structures.
- Take into account the impact of frost-belt situation in areas prone to extremely low temperatures and frequent frost when considering future uses of decommissioned buildings and structures.
- Take into account the occurrence and frequency of extreme weather conditions (e.g. droughts, flash floods, snow, cyclones, heat waves, high humidity etc.) when considering future uses of decommissioned buildings and structures.

2.1.2 Geology

- Take into account the presence of areas with problematic geological conditions (e.g. areas with hazards such as sink holes, fault lines etc.) when considering future land uses.
- Retain resource areas (i.e. areas with significant deposits of minerals, gems or construction materials) for future resource exploitation and use, or make provision for their exploitation before allowing further development.

⁷ Refer to the following document for more detail in this regard: *Department of Water Affairs and Forestry, February 2005. Environmental Best Practice Guidelines: Planning. Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.*

- Where possible, conserve aesthetically outstanding rock formations, features and landmarks.

2.1.3 Topography

- Take into account slope orientation (i.e. to maximise sunlight, protection from wind etc.) when considering future land uses.
- Retain significant and formative land forms in a natural state (i.e. specifically prominent land forms such as koppies, mountains, ridges and steep hills).
- Where possible, avoid development on gradients steeper than 1:4.
- Where possible, avoid development on flat or depressed terrain with potential drainage problems (i.e. gradients flatter than 1:20).
- Avoid areas with potential landslide hazards.
- Avoid outcrops of unique and high aesthetic value.

2.1.4 Surface hydrology

- Retain surface water features of conservation value (e.g. drainage lines, wetlands, lakes and estuaries) within structural developments, open space systems, reserves or recreation areas.
- Retain surface water features of recreational value (e.g. dams) within open space systems, reserves or recreation areas.
- Avoid flood-prone areas (1:50 year floodlines).
- Avoid creating threats to the effective functioning of water systems (e.g. canalisation, pollution or siltation) through the allocation and control of land uses and activities such as sewage, waste control, coffer dams, drifts and bridges.
- Promote the productive use of water features and sources (e.g. for fish production, irrigation, recreation etc.).

2.1.5 Ground water

- Avoid the pollution and over-allocation of ground water sources.
- Avoid areas with high water tables or poor drainage, especially for land uses that can pollute ground water.

2.1.6 Soil

- Avoid areas with problematic soil conditions (e.g. silts, sand or clays of poor stability or low compressibility).
- Promote good farming practices and avoid land uses that will greatly increase the erosion of susceptible soils (e.g. dispersive soils).
- Retain fertile soils with a high agricultural potential for agricultural use.
- Retain areas with resources such as kaolin or other clay deposits of commercial value for future resource exploitation and use, or make provision for their exploitation before allowing further development.

2.1.7 Flora

- Retain and protect endangered plant species within natural open space, reserves or other suitable land uses.

- Retain and protect vegetation communities of particular conservation value (e.g. those exhibiting species variety, soil binding functions, aesthetic attraction etc.).
- Compile a 'Harvesting of Natural Resources' policy where the project will entail large scale loss of species (e.g. for the development of a dam).
- Promote the systematic eradication of invasive plant species infestations, especially in protected areas and close to streams.
- Minimise threats to vegetation communities or plant species (e.g. through firewood collection, overgrazing, vandalism, offroad driving etc.). Promote proper veld and fire management.
- Promote the sustainable use and protection of indigenous vegetation for food, medicine or other uses.

2.1.8 Fauna

- Protect endangered animal species (i.e. birds, fish, wild animals and insects) and their habitat within open space, reserves or other suitable land uses.
- Protect animal communities of particular conservational value (i.e. those exhibiting species diversity, predators important for pest control etc).
- Retain game movement corridors wherever these exist, and ensure that these are included in future developments and land uses where required.
- Protect animal communities of recreational value (i.e. potential for angling, hunting, bird watching etc).
- Promote the eradication or containment of animal species that threaten local ecosystems (e.g. Indian mynah etc.).
- Minimise threats to animal species or communities (e.g. through habitat loss, veld fires or human intervention) and retain migration corridors.
- Promote the sustainable use and protection of wildlife or marine sources for food and other purposes.

2.2 Aesthetic environment

- Protect significant landscape or townscape elements, as well as scenic attributes, against injudicious development or designs that can detract from their value.
- New developments must integrate and blend with the surrounding landscape and land use.

2.3 Socio-economic environment

- Establish a Project Steering Committee (PSC), where Interested and Affected Parties (I&AP's) can present their inputs and where informed decision making may take place.
- Make use of existing social communication structures as basis for all community interaction initiatives.
- Ensure that all project related social issues are addressed. This may include the establishment of a Community Action Committee (CAC), a Labour Desk, Compensation Policies and an Equity Policy. Such issues must be planned well in advance.
- Allow for remuneration, transport and catering at meetings involving Stakeholders and Interested and Affected Parties.
- Allow for information sessions and educational tours as required.
- Make Strategic Development Plans available to stakeholders and I&AP's. Such plans aid in explaining and describing the extent of the project and all its components.

2.3.1 *Archaeological resources*

- Take note of any known sites of archaeological value in the area.
- Ensure the adequate protection of identified sites of archaeological value.
- Obtain a permit / authorisation from SAHRA regional office before removing or damaging any archaeological find or site

2.3.2 *Historical resources*

- Take note of any known sites of historical value in the area.
- Ensure the adequate protection of identified sites of historical value.
- Obtain a permit / authorisation from SAHRA regional office before removing or damaging any historical site. Such historical structures must be extensively documented (building material and historic context) surveyed (profile sketches and layout plans) and photographed as stipulated by the National Heritage Resources Act (Act no. 25 of 1999) before they may be damaged or destroyed.

2.3.3 *Cultural resources*

- Take note of any graves, cemeteries or burial sites within the area.
- Take note of any events, actions, or traditions that are current in the area.
- Ensure the adequate protection of graves, cemeteries, burial sites, places of worship, initiation schools and other sites of cultural value.
- Obtain approval from the relevant Provincial Department of Health before planning to relocate any grave. This includes interaction with relatives of the deceased. Authorisation for exhumation and re-interment must also be obtained from the relevant local or regional council. In addition, the institution conducting the relocation needs authorisation under Section 24 of the Human Tissues Act (Act No. 65 of 1983). Graves older than 60 years, but younger than 100 years are also protected in terms of the National Heritage Resources Act (Act No. 65 of 1983). Graves older than 100 years are considered as being archaeological.

2.3.4 *Air quality*

- Take note of existing air pollution levels and the degree to which this represents a health hazard when considering future land uses.
- Take note of the proximity of polluting industries or very high concentrations of traffic when considering future land uses.
- Promote and sustain the use of pollution free energy sources such as solar power where these are in effect. Plan for the use of such sources when considering future land uses.
- Minimise air pollution impacts through appropriate siting of polluting activities and traffic routes.

2.3.5 *Noise*

- Take note of high levels of noise pollution in the area, including routes or areas with heavy traffic when considering future land uses.
- Minimise noise pollution impacts through the appropriate siting of traffic routes or other noise generating activities and facilities.

- Plan for sound attenuation structures, such as earth berms, walls etc. where the noise is anticipated to be a nuisance.

2.3.6 *Social issues*

- Propose measures to revitalise depressed areas, or for their adaptation to new circumstances.
- Take into account the population growth, rate of urbanisation, the future need for resources (such as land and water) and the future need for services when considering future land uses.
- Take into account the impact of the seasonal influx of holiday makers or migrant workers when considering future land uses.
- Take note of the income of the community when considering future land uses.
- Take note of issues such as incidence of misbehaviour, crime, drug abuse or violence in the area and consider safety issues, such as visibility and the creation of 'defensible space'.

2.3.7 *Land use and services*

- Take note of any existing regional plans, including Development Frameworks, Development Plans and Town Planning Schemes that may be of relevance to the area under investigation.
- Attempt to integrate new and existing land uses.
- Keep natural open space and conserved areas intact to maintain the efficient functioning of natural corridor systems.
- Provide for access through or over in-traversable structures, especially where routes have been inundated.
- Be aware and respect the existence of access routes. If necessary, protect those of cultural, historical and social significance.
- Protect high potential farmland (i.e. crops, orchards and vegetable gardens) against land uses, misuse or development that can damage or reduce their productivity.
- Formulate guidelines to reduce the impact of farming activities in unsuitable areas, such as phasing out of activities, installing erosion protection etc.
- Take note of existing situations of surface or ground water pollution (e.g. illegal dumping, noxious effluent discharge, intensive use of agricultural fertilisers and pesticides) which pose a threat to human health or ecosystems.
- Take note of the proximity of communities who are without adequate sewage disposal facilities or waste removal services.
- Take note of any dumping or production of hazardous waste (e.g. toxic or radioactive substances).
- Formulate guidelines or propose measures for limiting water pollution, such as upgrading sewage services and introducing more efficient effluent control.
- Avoid the location of polluting land uses such as sewage works, waste disposal sites and cemeteries in areas of high water tables.

2.3.8 *Tourism*

- Take note of and make the most of vistas, views, scenic routes and landmarks of high aesthetic or tourist value when considering future land uses.

- Take note of and make the most of any destinations of high tourist value when considering future land uses.
- Protect and / or enhance features that may contribute to the tourist attraction of a place or area (such as providing a lookout).

3. GENERAL REQUIREMENTS AHEAD OF DECOMMISSIONING

- Prepare a Decommissioning Master Plan, indicating the following:
 - Infrastructure, buildings, structures and land uses to be retained
 - Alternative uses and further development proposals for retained infrastructure, buildings, structures and open space
 - Infrastructure, buildings and structures to be dismantled, removed, sold for recycling and / or disposed of.
- Ensure that the relevant legislative requirements (specifically in terms of the Environment Conservation Act (Act No. 73 Of 1989) have been met. The decommissioning of the following project components constitutes a change in land use, and thus requires the compilation of an EIA:
 - Pipelines
 - Tunnels
 - Canals
 - Gauging weirs
 - Dams and impoundments
 - River diversions
 - Public roads
 - Bridges
 - Reservoirs
 - Water treatment plants
 - Sewage treatment systems
 - Certain borrowing / prospecting activities
 - A change zoning for certain land use zoning
- For decommissioning projects requiring any degree of civil works, draw up a Provisional Environmental Site Management and Rehabilitation (ESM&R) Plan for issue to nominated contractors and / or tenderers for the construction contract. This plan must show the positions and extent of all construction site infrastructure and work sites and including areas requiring shaping, trimming, ripping, topsoiling and seeding⁸.
- For decommissioning projects requiring any degree of civil works, draw up a Provisional Water Management (WM) Plan⁹ for issue to nominated contractors and / or tenderers for the construction contract. This plan must show the positions, extent and specifications of all water management structures for the site¹⁰.
- Where necessary, draw up Plant Plans to indicate plant positions and plant species to be used during rehabilitation works.
- Identify all areas likely to be affected by decommissioning activities and indicate these on the ESM&R Plan.
- Ensure that the planning, location and design of the site is done in such a way that it does not compromise any infrastructure, buildings, structures and land uses to be retained.

⁸ Refer to the following document for more detail in this regard: *Department of Water Affairs and Forestry, February 2005. Environmental Best Practice Guidelines: Planning. Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.*

⁹ To be compliant with SABS 1200

¹⁰ Refer to the following document for more detail in this regard: *Department of Water Affairs and Forestry, February 2005. Environmental Best Practice Specifications: Construction. Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.*

4. MONITORING AND AUDITING

4.1 Introduction

In keeping with current environmental and associated legislation, all environmental management procedures and actions should be reviewed and refined on an on-going basis. This is in accordance with the dynamic nature of environmental management and allows for the timeous identification and mitigation of issues as they come to light. The process of review and refinement, built into the requirements of the IEMF, is known as Monitoring and Auditing.

4.2 Roles and responsibilities

Efficient implementation of the Best Practice Guidelines, effective Monitoring and Auditing, as well as clear Responsibility and Accountability allocation requires that various role-players be defined during the planning stages of a development project. Depending on the nature and scale of a project, project planning teams could be composed of any number of role-players, each with their own specified responsibilities.

Therefore, for the purpose of this document, the following role-players are defined, based purely on Responsibility and Accountability allocation. The actual designation of role-players may vary from project to project, but the responsibilities will largely remain as stated.

4.2.1 *Land owner or Custodian of the Land*

The Land Owner or Custodian of the Land is the person or organization with decision making capacity for the land in question, and thus ultimately accountable for what takes place on that land.

4.2.3 *Developer or Implementing Agent*

The person or organisation who funds the implementation of the project or activity is the Implementing Agent.

4.2.3 *Environmental Consultant*

The person or organisation, usually an independent PSP, who undertakes the initial preparation and submission of Impact Reports, Management Plans¹¹ and Environmental Management Programme Reports¹². Often this person undertakes a degree of environmental planning as well.

¹¹ Required for environmental authorizations as required by the Environment Conservation Act (Act No. 73 Of 1989).

¹² Required for environmental authorizations as required by the Minerals and Petroleum Resources and Development Act (Act No. 28 of 2002).

4.2.4 Project Manager

The Project Manager represents the Implementing Agent and co-ordinates all aspects of the project, streamlining planning and implementation. All members of the Planning Team as described hereunder report to the Project Manager, who in turn provides feedback to the Implementing Agent.

4.2.5 Design Engineer

The Design Engineer is involved during the planning and design phase of a project, and must ensure that relevant environmental planning and design considerations are taken into account during these phases. In this respect, the Design Engineer will usually work in conjunction with the Environmental Planner.

4.2.6 Environmental Planner

In addition to working with the Design Engineer to generate Zoning Plans, Master Plans, Plant Plans and associated detail designs, the Environmental Planner is also responsible for drawing up the provisional Environmental Site Management and Rehabilitation Plan and the provisional Water Management Plan. These plans are attached to the tender documents for inclusion in the pricing structure, as well as to the project specific EMP.

4.2.7 Contractor

The Contractor is the successful tenderer, appointed by the Implementing Agent to undertake the construction works as specified in a Construction Contract. The Contractor will ordinarily not be involved during the Planning Phase of a project.

4.2.8 Site Engineer

Also referred to in some instances as a Resident Engineer, the Site Engineer is responsible for construction site supervision and quality control during Construction. In some instances the Site Engineer may also assume the responsibilities of the Project Manager.

4.2.9 Environmental Officer

The Environmental Officer is responsible for managing the day-to-day on-site implementation of the Construction Contract and the Operational life of the project as required.

4.2.10 Environmental Control Officer

An Environmental Control Officer will undertake environmental audits for the duration of the Construction Contract and the Operational life of the project as required.

4.2.11 Independent Environmental Control Officer

An Independent Environmental Control Officer or External Auditor is an unaffiliated party who will undertake environmental audits for the duration of the project as required. Not all projects require and IECO as the inclusion of such an appointment is ordinarily specified for high profile projects and projects undertaken in sensitive areas.

4.2.12 Operator

The Operator is the nominated agent who Operates and Maintains the relevant Water Supply and / or Water Resource Infrastructure Works.

4.2.13 Environmental Manager

The role of Environmental Manager is one of strategic management of all issues pertaining to environment, not limited to any single project. The Environmental Manager is responsible for ensuring that the above Environmental roles are filled for all projects under his / her jurisdiction, and will be required to provide guidance, assistance and input as required during project lifecycle. In this respect, the Environmental Manager must be well versed in the minimum standards and responsibilities for each of the Environmental roles.

From time to time, the Environmental Manager will also be called upon to resolve conflicts and disputes.

Ordinarily, the Environmental Manager will undertake environmental audits for the duration of the planning process as required.

Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the Project Manager.

4.3 The Monitoring Procedure

Environmental Monitoring is the continuous evaluation of the planning process, and whether or not proper environmental planning processes have been followed.

To these ends, the Environmental Manager will monitor the project for compliance (i.e. Compliance Monitoring) with the Best Practice Guidelines. Many techniques for Environmental Monitoring have been proposed, each detailing a specific protocol. Regardless of which technique is used, the ultimate aim is that each environmental management specification be checked by means of a system in which a score may be allocated for:

- Full compliance,
- Satisfactory performance,
- Unsatisfactory performance and
- No action.

Refer to Appendix J of the following document for a pro-rata template according to which such Compliance Monitoring Reports may be prepared:

*Department of Water Affairs and Forestry, February 2005. **Environmental Monitoring and Auditing Guideline**. Integrated Environmental Management Sub-Series No. IEMS 1.7. Third Edition. Pretoria.*

Monitoring will take place at specified intervals during the feasibility and planning phases ahead of Decommissioning (refer to IEMS Sub-Series 1.4). Monitoring Reports will be submitted to the Project Manager, who will attend to issues and keep the reports on record, to be made available upon request by the Land Owner / Custodian of the Land and any Environmental Authority or I&AP requesting such.

4.4 The Auditing Procedure

Environmental Auditing is the process of comparing the impacts predicted with those which have actually occurred during implementation. An Environmental Performance Audit examines and assesses practices and procedures which, in the event of failure, would cause an environmental impact or result in an environmental risk. During each of the lifecycle phases of a development project, various issues will be monitored (see section 8.3). The Performance Audit will ensure that the monitoring was correctly undertaken and that compliance was achieved.

To these ends, the Environmental Manager will audit the project and its environmental management system for effectiveness. Many techniques for Environmental Auditing have been proposed, each detailing a specific protocol. Regardless of which technique is used, the ultimate aim of an Environmental Audit entails the following:

- The review of Monitoring Reports for the time elapsed,
- The verification of recorded monitoring results on site,
- The examination and evaluation of environmental management actions in terms of achieving responsible environmental management and the identification of deficiencies.
- The evaluation of the environmental management structure in terms of achieving responsible environmental management and the identification of deficiencies.
- The recommendation of amendments to the specifications, actions and management structure as deemed appropriate.

Refer to Appendix K of the following document for a pro-rata template according to which Audit Reports may be prepared:

*Department of Water Affairs and Forestry, February 2005. **Environmental Monitoring and Auditing Guideline**. Integrated Environmental Management Sub-Series No. IEMS 1.7. Third Edition. Pretoria.*

Audits will be undertaken during the feasibility and planning phases ahead of Decommissioning. Audit Reports will be submitted to the Project Manager, who will attend to issues and keep the reports on record, to be made available upon request by the Land Owner / Custodian of the Land and any Environmental Authority or I&AP requesting such.

4. CONCLUSION

The Guidelines included in this manual will help ensure that all projects earmarked for decommissioning remain within the ambit of sound environmental standards and norms and to ensure that these standards are properly defined and given due consideration during the necessary stages of project planning.

It should however be borne in mind that all the guidelines are not relevant to every project in the same capacity, and the relevant environmental considerations will have to be extracted for each project. In addition, reference to this guideline document should never be used at face value without first adapting the recommendations to the specific environment and project at hand. In this way a significant step will be taken towards truly integrated environmental planning and management, with a better chance at a sustainable and successful end result.

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