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CONTENTS

CHAPTER ONE: BACKGROUND

1.1	INTRODUCTION	1-1
1.2	NEEDS ASSESSMENT	1-1
1.3	TARGET USERS	1-2
1.4	REVISED OBJECTIVES	1-2
1.5	RELEVANT INITIATIVES.....	1-3
1.5.1	Introduction	1-3
1.5.2	Guidelines for toxicity tests	1-3
1.5.2.1	Purpose	1-3
1.5.2.2	Approach	1-3
1.5.2.3	Status	1-4
1.5.2.4	Relevance.....	1-4
1.5.3	Environmental Water Quality	1-4
1.5.3.1	Introduction.....	1-4
1.5.3.2	Integrated Water Resource Management (IWRM)	1-5
1.5.3.3	Status	1-5
1.5.3.4	Relevance.....	1-5
1.5.4	Resource Directed Measures.....	1-6
1.5.4.1	Introduction.....	1-6
1.5.4.2	Status	1-6
1.5.4.3	Relevance.....	1-7
1.5.5	Source classification	1-7
1.5.5.1	Purpose	1-7
1.5.5.2	National level classification.....	1-8
1.5.5.3	Water Management Area classification	1-8
1.5.5.4	Status	1-8
1.5.5.5	Relevance.....	1-8
1.5.6	Direct Estimation of Ecological Effect Potential (DEEEP).....	1-8
1.5.6.1	Approach	1-8
1.5.6.2	Status	1-9
1.5.6.3	Relevance.....	1-9

CHAPTER TWO: RESOURCE CLASSIFICATION FRAMEWORK

2.1	INTRODUCTION	2-1
2.2	ASSESSING ECOSYSTEM INTEGRITY.....	2-1
2.2.1	Ecological category and the Ecological Reserve	2-2
2.2.2	Guidelines for the Ecological Reserve	2-2
2.2.3	Resource Quality Objectives.....	2-3
2.2.4	Applicability to the NTMP	2-3
2.2.4.1	Monitoring endpoint	2-3
2.2.4.2	Monitoring variables	2-3
2.2.4.3	Reporting format.....	2-4
2.3	ASSESSING FITNESS FOR USE	2-4
2.3.1	Introduction	2-4
2.3.2	Water use class.....	2-5
2.4	IN THE ABSENCE OF A CLASSIFICATION	2-6
2.5	ADVANTAGES	2-6

CHAPTER THREE: NULL HYPOTHESES

3.1	INTRODUCTION	3-1
3.2	INTERPRETING HYPOTHESES	3-1
	3.2.1 Terminology	3-1
	3.2.2 Causes of errors.....	3-2
	3.2.3 Managing errors	3-3
3.3	SPECIFIC NULL HYPOTHESES	3-4
	3.3.1 Introduction	3-4
	3.3.2 Null hypothesis for status of ecosystem integrity	3-4
	3.3.2.1 Definition.....	3-4
	3.3.2.2 Consequences of "false negatives"	3-4
	3.3.2.3 Consequences of "false positives".....	3-5
	3.3.3 Null hypothesis for status of fitness for use.....	3-6
	3.3.3.1 Definition.....	3-6
	3.3.3.2 Consequences of "false negatives"	3-6
	3.3.3.3 Consequences of "false positives".....	3-7
	3.3.4 Null hypothesis for trends.....	3-7
	3.3.4.1 Definition.....	3-7
	3.3.4.2 Consequences of "false negatives"	3-8
	3.3.4.3 Consequences of "false positives".....	3-8
3.4	RECOMMENDATIONS.....	3-8

CHAPTER FOUR: CRITERIA FOR CHOOSING MONITORING VARIABLES

4.1	INTRODUCTION	4-1
4.2	GENERIC CRITERIA.....	4-1
	4.2.1 Costs as a design criterion.....	4-1
	4.2.2 Site selection options	4-2
	4.2.2.1 Classification-related monitoring.....	4-2
	4.2.2.2 Priority area monitoring	4-2
	4.2.2.3 Containment monitoring	4-3
	4.2.2.4 Source monitoring	4-4
	4.2.2.5 Criteria	4-5
	4.2.3 Water column, biota and sediments	4-5
	4.2.4 Consequences of errors.....	4-7
	4.2.4.1 Summary	4-7
	4.2.4.2 Implications of policy	4-7
4.3	EMPHASIS ON TOXICITY.....	4-9
4.4	CRITERIA FOR TOXICITY	4-9
	4.4.1 Classification framework	4-9
	4.4.2 Protective context.....	4-9
	4.4.3 Priority target organisms	4-10
	4.4.4 Ease of monitoring	4-10
	4.4.5 Procedure	4-11
4.5	CRITERIA FOR TOXICANTS	4-11
	4.5.1 Introduction	4-11
	4.5.2 Persistent Organic Pollutants (POPs).....	4-12
	4.5.3 Risk-based approach for additional toxicants	4-12
	4.5.3.1 Severity of impact.....	4-13
	4.5.3.2 Spatial impact.....	4-13
	4.5.3.3 Temporal impact.....	4-14
	4.5.3.4 Ease of monitoring.....	4-14
	4.5.3.5 Risk-based "wish list".....	4-15
	4.5.3.6 Reality-based "practical list"	4-16
	4.5.4 Criteria for additional toxicants.....	4-16
	4.5.4.1 Relative risk	4-16
	4.5.4.2 Ease of monitoring.....	4-16
4.6	RECOMMENDATIONS.....	4-16

CHAPTER FIVE: SPATIAL & TEMPORAL CORRELATION

5.1	INTRODUCTION	5-1
5.2	NATURE OF MONITORING VARIABLES	5-1
	5.2.1 Introduction	5-1
	5.2.2 Maximum monitoring frequency	5-1
5.3	TEMPORAL CORRELATION	5-4
5.4	SPATIAL CORRELATION	5-4
5.5	COMPARISON OF APPROACHES.....	5-4
	5.5.1 Entropy approach.....	5-4
	5.5.2 Principle components approach.....	5-5
5.6	RECOMMENDATIONS.....	5-5

CHAPTER SIX: CHOICE OF MONITORING VARIABLES

6.1	INTRODUCTION	6-1
6.2	TOXICITY	6-1
	6.2.1 Specific design recommendations	6-1
	6.2.1.1 Separation of ecosystem integrity and domestic use	6-1
	6.2.1.2 Generic tests versus site specific tests.....	6-1
	6.2.1.3 Coverage of trophic levels	6-1
	6.2.1.4 Simultaneous measurement of lethal and sub-lethal toxicity.....	6-2
	6.2.1.5 Water column versus biota or sediments.....	6-2
	6.2.1.6 Active monitoring	6-2
	6.2.1.7 Use of biota sampled in situ.....	6-2
	6.2.1.8 Relative sensitivity of aquatic organisms and humans	6-3
	6.2.1.9 Use of yeast test.....	6-3
	6.2.1.10 Multi-context toxicity tests.....	6-3
	6.2.2 Lethality versus sub-lethality	6-4
	6.2.3 Results	6-4
	6.2.3.1 Database	6-4
	6.2.3.2 Initial shortlists	6-4
	6.2.3.3 Discussion of shortlists	6-6
	6.2.4 Final recommendations.....	6-6
	6.2.4.1 Fish toxicity test	6-6
	6.2.4.2 Invertebrates.....	6-7
	6.2.4.3 Plants.....	6-7
6.3	TOXICANTS	6-8
	6.3.1 Final recommendations.....	6-8
	6.3.2 Guidelines	6-10
6.4	DECISIONS TO BE REVISITED.....	6-10

CHAPTER SEVEN: REFERENCES

GLOSSARY

Abiotic. In the absence of living organisms.

Antagonistic effect. Occurs when a mixture of toxicants exhibit an overall toxic effect that is less than the sum of the individual toxic effects when each acts alone.

Bioconcentration. The process of uptake of substances into animal or plant tissue through direct exposure to the substance in the environment.

Biotic. Of or pertaining to living organisms.

Biotoxicology: The qualitative and quantitative study of the adverse effects of chemical pollutants and other anthropogenic materials on organisms.

Carcinogenicity. The extent to which a toxicant can cause cancer.

Chemical pollutants. Chemicals dissolved or adsorbed on biotic or abiotic surfaces that can produce a toxic effect. These include metals or metal ions (e.g. lead, mercury, iron, manganese, etc.), inorganic chemicals (e.g. nitrate, ammonia, sulfate, fluoride, cyanide, etc.) and organic chemicals (e.g. phenols, petrochemicals, pesticides, steroids, algal toxins, etc.). Note that living organisms (e.g. faecal coliforms, viruses, parasites etc.) are excluded.

Definitive test. An experimental technique that estimates the concentration of the toxicant at which a specified percentage or number of organisms exhibit a certain response. Typically reports a toxicity endpoint, e.g. Lethal Concentration (LC), Effect Concentration (EC), Inhibition Concentration (IC), No Observed Effect Concentration (NOEC), etc.

Ecosystem. The total community of living organisms and their associated physical and chemical environment.

Ecosystem integrity. Aquatic ecosystem integrity is defined as the ability of an ecosystem to support and maintain a balanced, integrated composition of physico-chemical habitat characteristics, as well as biotic components, on a temporal and spatial scale, that are comparable to the natural state (i.e. unimpaired) characteristics of such an ecosystem. (High ecosystem integrity implies that the structure and functioning of an ecosystem are unimpaired by anthropogenic stresses.)

Endocrine disruption. The extent to which a toxicant mimics natural hormones, inhibits the action of natural hormones or alters the normal regulatory function of the immune, nervous or endocrine systems.

Fitness for use. A scientific judgement, involving evaluation of available evidence, of how suitable the quality of water is for its intended use or for protecting the health (integrity) of aquatic ecosystems [DWAF, 2003a].

Fungicide. A pesticide compound specifically used to kill or control the growth of fungi.

Heavy metal. A metallic element with atomic number greater than 20 (i.e. that of calcium).

Herbicide. A chemical pesticide designed to control or destroy plants, weeds, grasses or algae.

Hydrocarbons. A very large group of chemical compounds composed only of carbon and hydrogen. The largest source of hydrocarbons is petroleum crude oil.

Hydrophilic. Having an affinity for water.

Hydrophobic. Repelling water.

Inorganic. Composed of chemical compounds that do not contain carbon as the principal element (excepting carbonates, cyanides and cyanates). Matter other than plant or animal.

Insecticide. A pesticide compound specifically used to kill or control the growth of insects.

Lethality. The extent to which a toxicant can cause death by direct action.

Long-term effect. Any toxic effect (lethal or sublethal) that manifests *over a long period* (4 days or more) as a result of exposure to the toxicant.

Long-term exposure. Exposure of the organism to the toxicant delivered in multiple events or continuously *over a long period*, generally weeks or more. Also referred to as chronic exposure.

Mutagenicity. The extent to which a toxicant can damage or change an organism's or cell's genetic material.

Organic. Composed of chemical compounds based on carbon chains or rings and also containing hydrogen with or without oxygen, nitrogen or other elements.

Persistence. Refers to the length of time a compound introduced to the environment, stays there unchanged.

Pesticide. Substances or mixtures of substances intended (i) for preventing, destroying, repelling or mitigating any pest or (ii) for use as a plant regulator, defoliant or desiccant.

Petrochemicals. Chemicals made from petroleum or natural gas. Examples are ethylene, butadiene, most large-scale plastics and resins and petrochemical sulfur. Also called petroleum chemicals.

Petroleum products. Materials derived from petroleum, natural gas or asphalt deposits. Includes gasolines, diesel and heating fuels, liquefied petroleum gases (LPG and bugas), lubricants, waxes, greases, petroleum coke, petrochemicals and sulfur.

Pharmaceuticals. Drugs and medicinal compounds.

Pollutant. Any physical, chemical or biological object or substance that, when suspended, dissolved or adsorbed on biotic or abiotic surfaces in the water, causes pollution.

Pollution. Defined by the National Water Act as the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it (1) less fit for any beneficial use for which it may reasonably be expected to be used, or (2) harmful or potentially harmful to (a) the welfare, health or safety of human beings, (b) any aquatic or non-aquatic organisms, (c) the resource quality or (d) to property.

Rodenticide. A pesticide compound specifically used to kill or control the growth of rodents.

Screening test. A toxicity test performed on the water or test sample "as is", *i.e.* without dilution. Typically reports a percentage effect or a yes/no result.

Short-term effect. Any toxic effect (lethal or sublethal) that manifests *within a short period* (4 days) as a result of exposure to the toxicant.

Short-term exposure. Exposure of the organism to the toxicant delivered in a single event or multiple events *over a short period*, generally hours or days. Also referred to as acute exposure.

Sub-lethality. The extent to which a toxicant or has short- or long-term detrimental effects to living organisms without causing death.

Surfactant. A soluble compound that reduces the surface tension of liquids, or reduces the interfacial tension between two liquids or a solid and a liquid. Also called a surface-active agent.

Synergistic effect. Occurs when a mixture of toxicants exhibit an overall toxic effect that is greater than the sum of the individual toxic effects when each acts alone.

Target organism. The biological system of concern that will potentially manifest one or more toxic effects.

Teratogenicity. The extent to which a toxicant is capable of causing the formation of congenital anomalies or monstrosities. (Thalidomide is a well-known teratogen.)

Test organism. The organism used in a toxicity test.

Toxicant. A chemical pollutant capable of exhibiting a toxic effect.

Toxic effect. An effect manifest as an impairment of the activity of the organism or the cellular or sub-cellular system. In the current context, these effects are also limited to those that can be detected, either currently or potentially, locally or internationally, by a "toxicity test", as defined here.

Toxicity. In the current context, the degree to which a water exhibits toxic effects.

Toxicity test. In the current context, a toxicity test is regarded an experimental procedure that measures, under defined conditions in the laboratory or in the field, the toxic effects of chemical pollutants in water on a group of living organisms or a cellular or sub-cellular system.

Trace element. A chemical element that is needed in minute quantities for the proper growth, development, and physiology of an organism.

Waste. Defined by the National Water Act as including any solid material or material that is suspended, dissolved or transported in water (including sediment) and which is spilled or deposited on land or into a water resource in such volume, composition or manner as to cause, or to be reasonably likely to cause, the water resource to be polluted.

Watercourse. Defined by the National Water Act as a river or spring, a natural channel in which water flows regularly or intermittently, a wetland, lake or dam into which, or from which, water flows and any collection of water that the Minister may declare to be a watercourse. Furthermore, reference to a watercourse includes, where relevant, its bed and banks.

Water resource. Defined by the National Water Act as including a watercourse, surface water, estuary or aquifer.