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INTEGRATED
WATER QUALITY MANAGEMENT
IN
THAILAND

A thesis presented in partial fulfilment of the requirements for the degree of
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GLOSSARY

Baht	Thai currency \$ NZ 1 = 16 Baht
BOD	Biochemical Oxygen Demand (BOD). Oxygen consumed by the degradation of organic matter by organisms. Usually measured at 20 C and over 5 days.
Carrying capacity	Capacity of ecosystem to support organisms, while maintaining its productivity, adaptability and capacity of renewal.
COD	Chemical Oxygen Demand (COD). Oxygen consumed by the degradation of organic matters by strong chemicals.
Consent authority	The Minister of Conservation, a regional council, a territorial authority, or local authority that is both a regional council and a territorial authority, whose permission is required to carry out an activity for which a resource consent is required under the RMA 1991.
Criterion	Scientific data evaluated to derive the recommended limited for water uses.
Ecosystem	A system of plants, animals, and other living organisms together with the non-living components of their environment.
Externality	Costs of production activities that are not taken into account by the subjects making economic decisions. they do not bear these costs, but transfer them to other persons or to society as a whole.
Guideline	Numeric concentration or narrative statement recommended to support and maintain a designated water use.
Intrinsic value	In relation to ecosystems, means those aspects of ecosystems and their constituents parts which have value in their own right, including: (a) Their biological and genetic diversity; and (b) The essential characteristics that determine an ecosystem's integrity, form, functioning, and resilience.
Iwi authority	The authority which represents an iwi and which is recognised by that iwi as having authority to do so.
Local authority	Under the RMA 1991 means a regional council or territorial authority.
Periphyton	Benthic algae grow on the bed and on solid objects such as logs. These organisms play important roles in healthy ecosystems, but they can proliferate in certain situations and degrade desired water uses. Impacts include the smothering of natural aquatic communities, water intakes, degradation of water appearance and clarity.

pH	This term expresses the acidity of the water. pH 1 is very acid; pH 7 is neutral; pH 12 is very alkaline.
Pollution	The discharge by humans (directly or indirectly) of substances or energy into the aquatic environment, the results of which are such as to cause hazards to human health, harm to living resources and to aquatic ecosystems, damage to amenities or interference with other legitimate uses of water.
Saturation concentration	The maximum amount of a substances which can be dissolved in water. For oxygen, this declines with increasing temperature.
Standards	Numeric concentration or narrative statement that is recognised in enforceable environmental control laws of a level of government.
Suspended solids	Small particles suspended in the water column.

ACRONYMS

<	Less than
>	More than
=	Equal to
AEE	Assessment of Environmental Effect
BAT	Best Available Control Technology Economically Achievable
BCT	Best Conventional Control Technology
BMA	Bangkok Metropolitan Administration
BMPs	Best Management Practices
BOD	Biochemical Oxygen Demand
BOP	Bay of Plenty Regional Council
BPO	Best Practical Option
BPT	Best Practical Control Technology Currently Available
CAP	Changwat (provincial) Action Plan
Changwat	Province
COD	Chemical Oxygen Demand
DO	Dissolved Oxygen
DOC	The New Zealand Department of Conservation
DP	District Plan
ELA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EQA 1992	The Enhancement and Conservation of National Environmental Quality Act 1992
EQMP	The Environmental Quality Management Plan

FA 1992	The Factory Act 1992
Hg	Mercury
ICWE	International Conference on Water and Environment
IEAT	Industrial Estate Authority of Thailand
IUCN	International Union for Conservation of Nature and Natural Resources
MfE	Ministry for the Environment
mg/l	Milligramme per litre
MOSTE	Ministry of Science, Technology and Environment
N	Nitrogen
NESDB	The National Economic and Social Development Board
NESDP	The National Economic and Social Development Plan
NPS	National Policy Statement
NRA	National Rivers Authority
NZCPS	New Zealand Coastal Policy Statement
OECD	Organisation for Economic Co-operation and Development
P	Phosphorus
Pb	Lead
PCB	Polychlorinated biphenyl
PHA 1992	The Public Health Act 1992
PPP	Polluter-Pays Principle
RC	Regional Council
RCPS	Regional Coastal Policy Statement
RMA 1991	The New Zealand Resource Management Act 1991

RMLR	Resource Management Law Reform
RP	Regional Plan
RPS	Regional Policy Statement
SEA	Strategic Environmental Assessment
SS	Suspended Solids
UK	The United Kingdom
UN	The United Nations
UNEP	United Nations Environment Programme
U.S.A.	The United States of America
U.S.EPA.	The United State Environmental Protection Agency
WCED	The World Commission on Environment and Development
WWF	World Wide Fund For Nature

ABSTRACT

This thesis analyses the theoretical requirements for an integrated approach to freshwater resource management. The New Zealand and the Thai systems are then compared to understand variations between the two systems of planning at three different stages - Pre-Implementation, Implementation and Post-Implementation Stages. Finally, recommendations are made for improving the Thai system.

The research findings confirm that the New Zealand system measures up to criteria for ensuring sustainable development of freshwater resources. The system provides for planning based on river catchments and a variety of policy instruments may be used to achieve country objectives at all levels in the system. The Thai system provides for planning and developing of policy at national level and some parts of decision-making are delegated to the provincial level. At the implementation stage, the New Zealand system provides for a non-regulatory approach. Whereas, in Thailand, methods of policy implementation based on regulatory approach, are well-developed. At Post-Implementation stage, the New Zealand system provides for a monitoring system and less severe penalties than Thailand, where the system does not explicitly provide for monitoring, but severe penalties are imposed for deliberate actions to pollute rivers.

The findings suggest that the Thai system of water resources management can be improved in a number of ways, but the fragmentation of the planning process is the principle obstacle. Besides that, various future research areas identify which improvements to river water quality management in Thailand are a priority.