REVIEW OF ENVIRONMENTAL AUDITS PREPARED BY COUNTY COUNCILS IN THE NORTH EAST AREA.

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CONTENTS.

SUMMARY

This review provides an analysis of the Environmental Audits currently being produced by County Councils within the North East area of the Thames Region of the National Rivers Authority. In particular, it provides a comparison between the water chapters of each dicument, a comparison between the other chapters within the documents which cover water related issues and, finally a comparison with the main functional aims of the NRA is presented.

The appendices at the back of the review provide an in depth analysis of each of the documents studied.

REVIEW OF ENVIRONMENTAL AUDITS PREPARED BY COUNTY COUNCILS IN THE NORTH EAST AREA.

1.0 THE CURRENT SITUATION

1.1 Reasons for Environmental Audits

Agenda 21 is a United Nations action plan to "Promote environmentally sound and sustainable development in all countries". The Agenda identifies activities, including environmental audits, which Governments and others should employ to achieve these aims. Further, the British Governments "This Common Inheritance" recommends that local authorities should produce an audit of the state of the environment for their area. This policy guidance has culminated in environmental audits being produced by many County Councils (Lancashire 1990). The following is the reasoning several counties present for preparing their documents;

- **Lancashire** - "The overall purpose of the initiative is to provide the people of Lancashire, and all interested parties, with the first ever comprehensive picture of their own environment. It is hoped that this increased knowledge and awareness will then be used to stimulate and assist all concerned to put in hand the action needed to sustain and improve the quality of Lancashire's environment."

- **Essex** - "Its aim is to help people understand the area they live in by providing a comprehensive picture of existing conditions and identifying local problems. Environmental Audits are not an ends in themselves but their major purpose is to provide a basis for action."

- **Hertfordshire** - "The aim is to examine the current environmental situation and publicise the results so that this increased knowledge and public awareness can be used to stimulate all concerned to take the necessary actions to sustain and improve the quality of Hertfordshire's environment."

As may be seen, the reasoning for these audits all tend to be in the same vein and aiming towards the same goals.

This report concentrates on the audits produced by Bedfordshire, Hertfordshire, Essex and Lancashire. The latter audit has been praised by many commentators for its thoroughness.

1.2 History of Environmental Audits

For all except Bedfordshire, the audits reviewed are the Counties first attempt at Environmental Audits, therefore their history is quite brief.

1.2.1 Lancashire 1990 - Decided to research and publish their Green Audit 1990. Set up Lancashire's environmental Forum.

1.2.2 Bedfordshire 1993 - Third in a series drawing together information from a range of different sources. The text

highlights changes that have occurred since the last report and updates supplementary information contained in the 1991 and 1992 reports.

1.2.3 Hertfordshire 1992- First step in the process. Progression from advice within Agenda 21 and This Common Inheritance.

1.2.4 Essex 1992 - As Hertfordshire

1.3 Interaction with the NRA's Objectives

Several of the stated aims of the National Rivers Authority are comparable to those of the Environmental Audits, for example;

- To assess, manage, plan and conserve water resources and to maintain and improve the quality of water for all those who use it.

- To improve public understanding of the water environment and the NRA's work

Apart from the aims stated above the NRA also has interests in many other areas(e.g. flood defence, fisheries). The Audits, whilst maybe covering these issues briefly, do not allocate the same degree of importance to them as the NRA. There is therefore an opportunity for the NRA to become more involved with the preparation of these documents, to ensure that the NRA's aims are promoted further in these and other audits which are more than likely to be produced.

1.4 Approach

The approach which was adopted in order to produce this review is as follows. The Lancashire plan was used on a comparative basis as it was felt that this document provided a broad scope of information whilst also being detailed. Each County's document contained a chapter on water therefore it was decided to compare each of these chapters with the Lancashire Audit chapter. However, water related issues were also contained within the other chapters of each audit, therefore a further comparison was made between these and the Lancashire audit. The main analysis is contained within Appendices 1-3.

2.0 KEY FINDINGS

2.1 Water Chapter - Scope and Depth

The Lancashire audit was used as a bench mark for comparison with the other documents. An allocated score of 5 represents coverage which is equivalent to that within the Lancashire plan. A score of 6-10 represents subject coverage greater than that within the Lancashire document, and 0-4 is coverage which is less than the Lancashire plan.

Table One - Comparison between the NRA functions and issues covered in the Water chapters.

	LANCS'	HERTS'	BEDS'	ESSEX
Water Quality	5	5	5	6
Water Resources	5	5	6	3
Flood Defence	5	0	2	0
Fisheries	5	1	6	0
Conservation *A	0	0	0	0
Recreation *B	0	0	0	0
Totals	**20**	**11**	**19**	**9**

NOTES

***A - There is a general feeling within the text towards conservation, but no actual part of the chapter is devoted specifically towards this area.**
***B - Recreation is not mentioned within any of the documents' water chapters but it is covered elsewhere within some of the documents.**

Scope varies quiet a lot within the individual documents. Bedfordshire's audit is very brief, providing only a general coverage (it is basically an update to previously published reports). Lancashire, on the other hand, is a very in depth report, and in parts, very technical and jargonised. The Hertfordshire document is very similar to the Lancashire plan. The Essex audit was less detailed but covered all the importantareas but without getting too caught up in technical details.

2.2 Summary of Other Key Water Related Coverage.

Table Two - Comparison of water issues covered in non-water chapters

	Lancs'	Herts'	Beds'	Essex
AIR	5	6	0	7
WASTE	5	5	0	4
ENERGY	5	2	0	8
LAND & ABRI	5	2	0	0
WILDLIFE	5	0	0	9
TRANSPORT	5	2	0	9
OUTDOOR RECREATION	5	0	0	10
HABITATS	5	10	0	0
TOTALS	**40**	**27**	**0**	**47**
OVERALL TOTALS *A	**60**	**38**	**19**	**56**

NOTES

***A - These figures represent the cumulative totals of tables one and two. The overall results show that the Essex document is the most comparable to the Lancashire document. The same marking system as Table One has been used for Table Two.**

3.3 Core Monitoring

Although each area has a similar format, different Counties place varying amounts of importance on certain elements:

- **Lancashire** - places great importance on water quality and goes into great detail for each of its main rivers. Also quite a bit of space is allocated to water pollution.
- **Hertfordshire** - Once again looks into water quality, allocates quite a lot of space to drinking water quality.
- **Bedfordshire** - Quite broad overview of all the areas, but once again water quality is the area most examined.
- **Essex** - Drinking water quality is given quite a lot of space. Also water quality.

The NRA has recently prepared a number of functional strategies which incorporate "Success Criteria" against which environmental improvements can be measured. The extent to which these are reflected in the audits is shown in Table Three.

Table Three - Comparison with the NRA's success criteria

NRA Key Indicators	Lancs	Herts'	Beds'	Essex
Water Quality				
- 1	Y	Y	Y	Y
- 2	Y	Y	Y	Y
- 3	Y	Y	Y	Y
- 4	Y	Y	Y	Y
- 5	Y	Y	Y	Y
- 6	Y	Y	Y	Y
Water Resources				
- 1	*	*	*	*
- 2	Y	Y	N	N
- 3	Y	Y	N	N
Flood Defences				
- 1	N	N	N	N
- 2	N	N	N	N
- 3	Y	N	N	N
- 4	N	N	N	N
- 5	Y	N	N	N
- 6	N	N	N	N
- 7	N	N	N	N
Fisheries				
- 1	N	N	N	N
- 2	N	N	N	N
- 3	N	N	N	N
- 4	N	N	N	N
- 5	N	N	N	N
- 6	N	N	N	N
- 7	N	N	N	N
- 8	N	N	N	N
- 9	N	N	N	N
Conservation				
- 1	N	N	N	N
- 2	N	N	N	N
- 3	N	N	N	N
- 4	N	N	N	N
- 5	N	N	N	N
- 6	N	N	N	N
- 7	N	N	N	N
Recreation				
- 1	N	N	N	N
- 2	N	N	N	N
- 3	N	N	N	N
- 4	N	N	N	N
- 5	N	N	N	N
- 6	N	N	N	N

#A - Refer to Appendix Four for an explanation of the NRA's success criteria.

* - Not Applicable

It should be noted that the information contained within Table Three is a comparison with the exact functional aims of the NRA, therefore the Environmental Audits may contain information on the subject area, but not that of the specific mission statement.

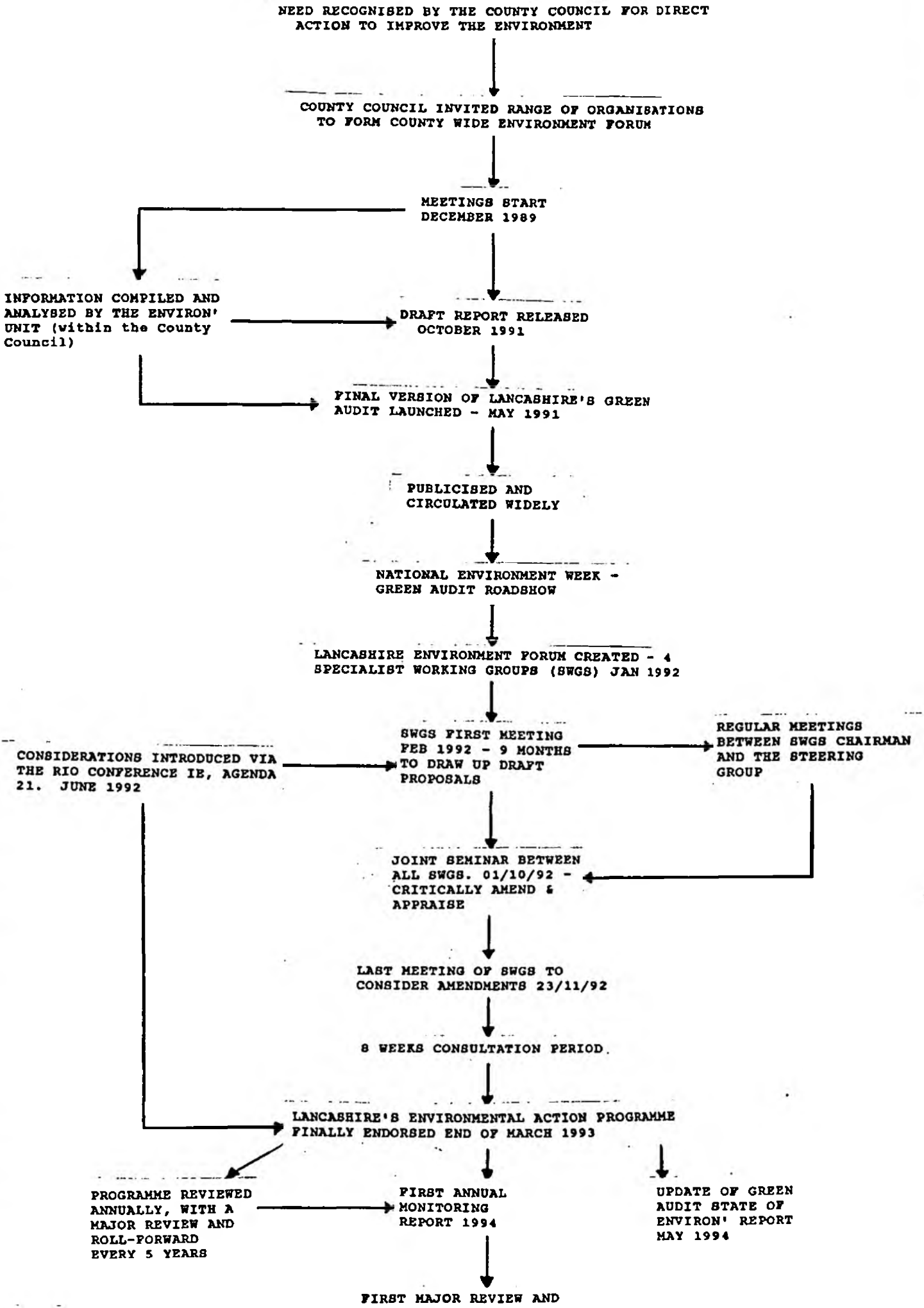
3.0 CONCLUSIONS

3.1 Consideration should be paid to the fact that this is the first attempt for most of the areas at this sort of plan, so there will obviously be room for improvement.

3.2 It is hoped that the NRA may be able to play a more active role within the preparation of these documents in the future. Instead of being reactive to the information within the plans, ideally it would be desirable for the Authority to play a more pro-active role, ie becoming more involved in consultation and preparation.

3.3 Each plan has its individual merits, for example Lancashire for its depth of information, however it was considered that, in terms of balancing scope, technicality and clarity, this was achieved best within the Essex document.

FLOW CHART - MAJOR STEPS IN THE LANCASHIRE ENVIRONMENT PROGRAMME.



APPENDIX ONE

MAIN HEADINGS - Chapter Four (Water) Lancashire Green Audit / Hertfordshire Environment Forum

EXPLANATION
The following shows a summary of the main headings within the Lancashire Green Audit and The Hertfordshire Environment Forum. The text with a # next to it represents that which is only contained within the Lancashire document. That with a * alongside determines information that is contained within both documents. And finally, text which appears in bold print is that which is found within the Hertfordshire plan only.

* INTRODUCTION

* LEGISLATION
  * European measures
  * United Kingdom

* ORGANISATIONS
  * Central Government
  * Water supply & sewerage company
  * Local Government
  * Other organisations

* WATER QUALITY IN LANCS

  * Water Quality Monitoring
  # Inland surface waters
  # Groundwaters
  # Coastal waters
  # Discharges
  # Drinking water

  * Quality of Rivers & Streams
  * Introduction
  * NWC river classification
  * General assessment of river quality
  - River Keer
  - River Lune & tribs
  - River Wyre & tribs
  - River Ribble & tribs
  - River Douglas & tribs
  - River Irwell & tribs
  - River Profiles
  - River Lee
  - River Mimram
  - River Ver

  * Quality of Standing Waters
  * Lakes
  * Reservoirs
  * Ponds & pits
  * Canals

	# Quality of Groundwaters
	# Quality of Estuarine & Coastal Waters
	# Lune estuary
	# Wyre estuary
	# Ribble estuary
	# Morecambe Bay
	# Coastal waters
	* Bathing waters
	# Quality of Offshore Waters in the Irish Sea
	# Inputs of pollutants
	# Impact of pollutants
* Water Pollution Sources & Impacts	# Introduction
	# Discharges
	# Trade discharges
	# Agricultural discharges
	# Water-borne infections
	# Bacteria & viruses in rivers
	# Acidification
	# Eutrophication
	# Radioactive discharges
	- Consented discharges
	- Pollution incidents
* Drinking Water Quality	# Introduction
	# Prescribed concentrations or values
	# Relaxations & undertakings
	* Lead
	* Aluminium
	# Total coliforms
	# Iron
	# Hydrogen ion
	* Colour & turbidity
	# Trihalomethanes
	* Private water supplies
# Water Abstractions	
# Flood Defence	
- Summary and Key Issues	**- Summary**
	- Key Issues

LANCASHIRE GREEN AUDIT - CHAPTER FOUR SUMMARY (WATER) AND THE HERTFORDSHIRE ENVIRONMENT FORUM - CHAPTER NINE SUMMARY (WATER)

Explanation

The following shows a summary of the information contained within the Lancashire Green Audit and the Hertfordshire Environment Forum. The text with a # next to it represents that which is only contained within the Lancashire document. That with a * alongside determines information that is contained within both documents. And finally, text which appears in bold print is that which is found within the Hertfordshire plan only.

*** INTRODUCTION** - (1/2 a page)

* The need for water eg. domestic consumption, agricultural, waste disposal etc
# Increase in domestic water consumption
* Quality of water determined by natural characteristics and human activity
# Pollution

- Current Issues:
- **The pollution of rivers by industrial and sewage effluent**
- **The use of nitrates, herbicides. pesticides and fungicides on agricultural land and the subsequent concentrations of these chemicals in rivers, groundwaters and, primarily in the drinking water supply.**
- **The increasing demand for water and the subsequent shortages during the summer months.**
- **The lowering of the water table and river flows.**
- **Waste tips and contaminated land polluting the water resources and affecting supply.**

- Looks at issues using monitoring information largely supplied by the NRA and the water companies.

*** LEGISLATION** - (1.5 pages)

* A) European Measures;
* Water pollution Directives concerning dangerous substances and quality
* List I (Black List) - 129 substances and UK Red List (23 of these 129 substances)
* List II (Grey List)
* Directives concerning surface waters used for drinking, recreation and harvesting freshwater fish and shellfish
* Directives concerned with bathing water quality
* **B) United Kingdom;**
* Water Act 1989
# Specific parts of the Water Act sited of particular importance, these being; S52, S54, S67-74, S107-116, S123
* States the major aims of the National Rivers Authority (NRA), specifically the aim of regular monitoring

- Legislation relating to water supply
- Legislation relating to sewerage services

* ORGANISATIONS - (3/4 page)

* A) Central Government
* Government responsible for applying EC directives
* NRA - primary national organisation for the control of water resources. States the role of the NRA
* Drinking water inspectorate - quality of mains water and for ensuring water supply
- **Two main departments involved; Doe and MAFF**

* B) Water Supply and Sewerage Company
# North West Water (NWW) - supplying drinking water, treating and disposing of sewage
* Mains water quality
- **Role of private water companies**

* C) Local Government
* Role of District Council's environmental health departments
* County council has no direct regulatory role

* D) Other Organisations
* Many organisations involved eg. FoE
- **Localised pressure groups working together on specific problems within their local area.**
- **Academic institutions.**

* WATER QUALITY IN LANCASHIRE - (2.5 pages)

* A) Water Quality Monitoring
* Extensive monitoring system - existing for a number of years. Different systems encountered within the following areas;
    i> Inland surface waters;
    - All monitoring is the responsibility of the NRA
    - NRA must ensure water resources aren't depleted
    - Flow gauges to monitor flow
    - Use of chemical sampling and biological sampling points
    - Use made of the Harmonised Monitoring Network (HMN)
    - NWW monitors water supply reservoirs as well as some education establishments

(Information is provided on the above but it is not in as much detail).

  # ii> Groundwaters;
    # NRA is responsible for boreholes

- The NRA issues licences to those who abstract water from the aquifers, ie; the water companies, industry and agriculture. the licences limit the amount which may be extracted.

 iii>Coastal Waters;
    # Monitoring of most of the discharge to surface water is the NRA's responsibility
    # Sewage is usually the responsibility of the NRA

 * iv>Drinking Water;
    # NWW monitors the drinking water

B) Quality of rivers and streams - (14 pages)
DoE has defined hydrometric areas as a basis for examining river systems
Detailed information of the quality of the rivers is presented

Used information from the 1985 National River Survey, NRA 1989 NWC survey and summary sample statistics 1980-90
Main water quality problems are recognised including; organic pollution and nutrient enrichment
Information is provided on all of the main rivers in the locality and their tributaries

- Quality Classifications; - NRA monitors the water quality of rivers and canals and sets the water quality objectives for the water environment.
- The NRA samples rivers at least monthly and at strategic sites as often as weekly.
- NRA biological surveys.
- Changing river flows is cause for concern as it may lead to streams drying out, which eventually may affect the aquatic environment.
- River profiles - Information is given on the rivers within the locality, also details on flow, geology, average rainfall etc.

Quality of standing Waters - (1.5 pages)
* Examines the quality of; lakes, reservoirs, ponds and pits and canals

- Lakes and Ponds - County Land Use information systems does not identify the area of the country covered by open water, as it is relatively small. Much of it is of biological value, which takes time to build up and can be damaged through pollution.
- Still waters accumulate soluble pollutants within their catchment areas and are particularly affected by excess nutrients, such as nitrogen and phosphate based fertilisers, sewage, silage and detergents.
- Excess nutrients accelerate natural eutrophication, causing algal blooms and inhibiting the growth of plants and aquatic organisms.
- Ponds are also polluted by detritus of rubber, oil and mineral salts - this accumulates on roads and is washed into water courses and can form a toxic film on the water surface.

* D) Quality of Groundwaters - (1 page)
# NRA carries out limited bore hole monitoring

E) Quality of Estuarine and Coastal Waters - (6 pages)
F) Quality of Offshore Waters in the Irish Sea - (3 pages)

* <u>WATER POLLUTION - SOURCES AND IMPACTS</u>

Effluent comes from three sources; trade operations, agricultural activities and sewage, with sewage being the most numerous
Principle discharges requires NRA consent

- Pollution Incidents - details of reported pollution incidents. The main causes of incidents are oil, chemical and sewage spillage. The NRA categorises pollution incidents in terms of their severity, ranging from minor through to major.

* A) Discharges - (2.5 pages)
# Three aims of sewage treatment;
    # Removal of faecal, organic and other solids by screening

and/or settlement and the production of sewage sludge
  # Removal of dissolved and suspended organic material by converting to biological material and its subsequent settling to produce secondary sludge
  # Final effluent with a low level of BOD and suspended solids to minimise impact on receiving waters
* Criteria for NRA discharge consent

B) Trade Discharges - (1/2 page)

Trade discharges can contain a wide range of potentially polluting elements
The more significant discharges are consented and monitored by the NRA

C) Agricultural Discharges - (2 pages)

Impair the quality of water quality
Agricultural pollution may lead to prosecution

* WATER BORNE INFECTIONS - 3/4 page

Gut and various other pathogens enter the water directly/indirectly via sewage treatment works. Removal of pathogens is limited and there are no biological standards
Pathogenic bacteria and protozoa can remain viable for variable lengths of time - they may be ingested by humans and animals
* Three main types of water-borne pathogens; leptosprire, salmonella and cryptosporidium

- Untreated water can act as a means of spreading harmful bacteria and other organisms to man eg. viruses, protozoa and worms. Bacterial conditions include; typhoid fever, paratyphoid fever, bacillary dysentery, leptospirosis, legionnaires disease and blue green algal toxin.

BACTERIA AND VIRUSES IN RIVERS - 1/4 Page

Monitoring programme of bacteriological quality of the river
No formal standards apply to non-designated bathing waters but rivers may still be subject to regular recreational and amenity use, so ingestion of water may occur

Acidification - (1/2 page)
NNW have completed a study for the Doe examining the extent and effects of acidification in Cumbria and South Pennines

Eutrophication - (1 page)
NRA national programme to monitor presence of potentially toxic blue-green algae at 500 sites

Radioactive Discharges - (2.5 pages)
Nuclear installations discharge liquid radioactive effluents to surface waters

* DRINKING WATER QUALITY - (10 pages)

* WATER ABSTRACTIONS - (2 pages)

* Abstractions controlled by the NRA
* All regular abstractions require a licence except for domestic or agricultural abstractions of less than 200 litres a day
# Six main groups of water abstractors;
    - mains water supply
    - private water supply
    - agricultural uses
    - spray irrigation
    - industrial use
    - misc

(Information was once again a little less detailed)

FLOOD DEFENCE - (3/4 page)

Mainly the responsibility of the NRA
NRA has a major capital works programme for improving flood defence

- SUMMARY AND KEY ISSUES - Summary - The water environment is strictly regulated by UK acts and regulations and EC directives. Regular monitoring is carried out.

- Key Issues - Water supplies are limited. How can demand be reduced and supply increased without damaging the environment?
- What emphasis should be played by alternative sources of supply (such as piped water from outside the region), planning policies, infrastructure, maintenance, conservation and measures to change consumers' appreciation of the value of water as a resource?
- Can more be done to ensure that pollutants such as chlorinated solvents, nitrates, herbicides and pesticides are kept out of water sources, and should greater controls be placed on the industrial and agricultural users of these materials?
- What further steps can be taken to secure and improve the long term ecological diversity of the country's water courses, in the face of low flows, pollutant levels and increasing proportions of sewage effluent?

LANCASHIRE GREEN AUDIT/THE REPORT ON THE STATE OF HERTFORDSHIRE'S ENVIRONMENT

A comparison with "A REPORT ON THE STATE OF HERTFORDSHIRE'S ENVIRONMENT".

EXPLANATION OF METHOD

The following presents a summary of the contents of the Lancashire Green Audit and the Report on the State of Hertfordshire's Environment. It looks at the chapters other than the main Water chapter. Where a # appears next to the text it represents a point that is contained within the Lancashire Plan but not within the Hertfordshire document. A * represents information that is contained within both documents. Finally, the text which appears in bold is that which appears within the Hertfordshire plan only.

CHAPTER TWO - The structure of Lanc's environment

Pg 16 - (1 paragraph) River valleys - major landscape features and corridors for human settlement and movement. States the main valley systems with regards to the county's drainage and effluent system, also recreational resources and wildlife habitat.

* Pg 20/ - (2 paragraphs) Rainfall - States the wettest and driest months.
- **Average rainfall over the past twenty years**

- **Pg 14 - Topography - Importance of streams and rivers to the landscape and ecology**

CHAPTER THREE - Air

* Pg 53/ - (1 page) Acid Rain - Long term effects on freshwater, groundwater, soils, forests, crops and buildings. Power stations and industrial process vehicle emissions. Effects of acid rain on the county.
- **Pg 143 - Acid Rain - Monitoring Network**

Pg 54/ - (1.5 pages) Global Warming and Sea Levels - Intergovernmental Panel on Climate Change.

- **Pg 127 - Climate Change - Greenhouse gases**
- **Pg 128 - Acid deposition**
- **Pg 128 - Ozone layer depletion**

CHAPTER FIVE - Waste

Pg 142/ (1/2 page) Groundwater and Surface Water Contamination - Uncontrolled discharge of leachate can lead

to fishkills. NRA monitors surface water and will prosecute. Contaminated groundwater is very serious and can effect drinking water quality. FOE report identifying contaminated sites ie those 'posing some risk to groundwater' but lack of conclusive evidence.

- **Pg 117 - (1 page) Environmental effects of waste disposal - Leachate - the filtration of water into a landfill site, coupled with the biochemical and physical breakdown of wastes. Landfill sites must be selected and engineered to ensure the protection of water resources.**

CHAPTER SEVEN - Energy

Pg 176/ - (3/4 page) Energy from Water - Three types of water generated energy sited; hydro-electric power. tidal power and wave energy. Consideration of sites for an hydro-electric power station.

Pg 181/ - (1/2 page) Acid Rain and Global Warming - Both need to be monitored with regards to energy consumption.

- **Pg 102 - Renewable energy - (1 paragraph) Thames Water Utilities plant which generates electricity from sewage gas.**

CHAPTER EIGHT - Land and Agriculture

Pg 203 - (1 paragraph) Inland water - Distribution

Pg 206 - (1.5 pages) Commercial Fisheries - The importance of rivers, canals and ponds for coarse and game fishing. Salmon presence. Commercial fishing as a local employer.

Pg 209 - (1.5 pages) Environmental Effects - Agricultural pollution of water - fertilizers and pesticide application leads to hyper eutrophication of the watercourse. Farm yard washings and dairy parlour washings constitute another pollution source.

- **Pg 34 - (1 paragraph) Mineral extraction - Risk of water pollution occurring from discharge from the extraction sites and through interception of the water courses. Silty water is normally settled in ponds for re-use or discharge, while the chemicals used in some of the associated plants have to be collected in sealed units and removed for disposal.**

CHAPTER NINE - Wildlife

Pg 232/ - (2 pages) - Freshwater Habitat - Presence of lakes and public supply reservoirs.

Pg 234/ - (2.5 pages) - Coastal Habitats - Six basic habitat types; mudflats and sandflats, saltmarshes, sand beaches and dunes, low clay cliffs, small stretch of rocky cliffs and limestone cliffs.

Pg 238/ - (1 paragraph) - Streamsides - Discusses lack of tree and shrub cover.

CHAPTER TWELVE - Transport

* Pg 304 - (2 paragraphs) - Canals -The presence of canals.
- **Pg 89 - Waterways - Two main canal networks. Purely recreational.**

Pg 309/ - (1/2 page) - Effects on water of road building ie, how it can effect drainage patterns of an area, affecting watercourses and groundwater levels.

CHAPTER THIRTEEN - Issues for the Future of Lanc's Environment

Pg 315 - (1.5 pages) - Water Quality Issues (13.4)
Also points; 13.3.12, 13.3.16, 13.3.17 - Air Quality Issues
13.5.44, 13,5.48, - Waste Issues
13.7.78 - Energy Issues
13.8.90, 13.8.91, 13.8.92 - Land & Agriculture
13.9.104, 13.9.106, 13.9.107 - Wildlife Issues

APPENDIX D - Pg 327 - Drinking Water Supply Zones in Lanc's 1990.

APPENDIX 3.2 - Aquatic and Wetland habitat change
3.13- Important Aquatic Habitats in Herts
9.1 - EC Directives Relating to Water Quality & Supply
9.2 - UK Legislation Pertaining to the Water Act 1989
9.3 - NRA Key Objectives
9.4 - Sampling Frequencies for Classes A,B,1 & 2 private water supplies
9.5 - Undertakings taken under s20 (5)(B) of Water Act 1989 for Water Supply Zones in Herts
9.6 - Prescribed Concentrations or Values for substances in Water Supplies

CHAPTER THREE - HABITATS

- **Pg 47 - Aquatic and Wetlands Habitats (3 pages) Quantative data is fragmentary**
Ponds and Lakes - states that three major open water types exist in the county; Dystrophic, Mesotrophic and Eutrophic
Flowing Waters - ecological status
- **Groundwater Extractions and their effect upon rivers and small streams**
Physical and biological degradation by such means as; canalization, dredging, pollution. low flows and low groundwater levels
Seasonal streams or brooks
Springs - Chalk springs and flush line springs
Miscellaneous Aquatic Habitats - Watercourses such as canals, drainage ditch systems, watercress beds and sewage lagoons
Wetlands

APPENDIX TWO

MAIN HEADINGS - Chapter Four (Water) Lancashire Green Audit / Bedfordshire Environment Report

EXPLANATION
The following shows a summary of the main headings within the Lancashire Green Audit and The Bedfordshire Environment Forum. The text with a # next to it represents that which is only contained within the Lancashire document. That with a * alongside determines information that is contained within both documents. And finally, text which appears in bold print is that which is found within the Bedfordshire plan only.

INTRODUCTION

* LEGISLATION
  * European measures
  (Not in very much detail)
  # United Kingdom

ORGANISATIONS
  # Central Government
  # Water supply & sewerage company
  # Local Government
  # Other organisations

* WATER QUALITY IN LANCS

  * Water Quality Monitoring
  # Inland surface waters
  * Groundwaters
  # Coastal waters
  # Discharges
  * Drinking water

  # Quality of Rivers & Streams
  # Introduction
  # NWC river classification
  # General assessment of river quality
  - River Keer
  - River Lune & tribs
  - River Wyre & tribs
  - River Ribble & tribs
  - River Douglas & tribs
  - River Irwell & tribs

  -- Quality of Standing Waters
  # Lakes
  # Reservoirs
  # Ponds & pits
  # Canals

  - Quality of Groundwaters

  # Quality of Estuarine & Coastal Waters
  # Lune estuary

	# Wyre estuary # Ribble estuary # Morecambe Bay # Coastal waters * Bathing waters
	<u># Quality of Offshore Waters in the Irish Sea</u> # Inputs of pollutants # Impact of pollutants
Water Pollution Sources & Impacts	# Introduction * Discharges # Trade discharges # Agricultural discharges # Water-borne infections # Bacteria & viruses in rivers # Acidification # Eutrophication # Radioactive discharges **- Modification of water quality supply zones** **- Sources of drinking water**
* Drinking Water Quality	# Introduction # Prescribed concentrations or values # Relaxations & undertakings * Lead # Aluminium # Total coliforms * Iron # Hydrogen ion # Colour & turbidity # Trihalomethanes # Private water supplies
# Water Abstractions	
* Flood Defence	**- Floods and Droughts**

LANCASHIRE GREEN AUDIT - CHAPTER FOUR SUMMARY (WATER) AND THE BEDFORDSHIRE ENVIRONMENT REPORT - SUMMARY (WATER)

Explanation

The following shows a summary of the information contained within the Lancashire Green Audit and the Bedfordshire Environment Report. The text with a # next to it represents that which is only contained within the Lancashire document. That with a * alongside determines information that is contained within both documents. And finally, text which appears in bold print is that which is found within the Bedfordshire plan only.

INTRODUCTION - (1/2 a page)

The need for water eg. domestic consumption, agricultural, waste disposal etc
Increase in domestic water consumption
Quality of water determined by natural characteristics and human activity
Pollution

(NO INTRODUCTION)

*** LEGISLATION** - (1.5 pages)

A) European Measures;
Water pollution Directives concerning dangerous substances and quality
List I (Black List) - 129 substances and UK Red List (23 of these 129 substances)
List II (Grey List)
Directives concerning surface waters used for drinking, recreation and harvesting freshwater fish and shellfish
Directives concerned with bathing water quality
- **The EC is considering a directive on "Ecological Water Quality" - member states would be required to set up systems for monitoring the ecological quality of all rivers, lakes and inshore seas; to draw up an inventory of pollution sources and to establish and implement action programmes for improvements.**

* B) United Kingdom;
* Water Act 1989
# Specific parts of the Water Act sited of particular importance, these being; S52, S54, S67-74, S107-116, S123
# States the major aims of the National Rivers Authority (NRA), specifically the aim of regular monitoring
- **December 1992 - DoE published consultation documents on government proposals for water quality objectives, with the regulations to be in place by 1993. The resulting action programme will extend over 5 to 15 years.**

ORGANISATIONS - (3/4 page)

A) Central Government

Government responsible for applying EC directives
NRA - primary national organisation for the control of water resources. States the role of the NRA
Drinking water inspectorate - quality of mains water and for ensuring water supply

* B) Water Supply and Sewerage Company
# North West Water (NWW) - supplying drinking water, treating and disposing of sewage
# Mains water quality
- **1991 all water companies were subject to a technical audit by the Drinking Water Inspectorate.**
- **Each year the water companies are given the opportunity to modify their water quality supply zones.**

C) Local Government
Role of District Council's environmental health departments
County council has no direct regulatory role

D) Other Organisations
Many organisations involved eg. FoE

(There is no information on organisations except for some brief details on the NRA)

* <u>WATER QUALITY IN LANCASHIRE</u> - (2.5 pages)

* A) Water Quality Monitoring
# Extensive monitoring system - existing for a number of years. Different systems encountered within the following areas;

i> Inland surface waters;
- All monitoring is the responsibility of the NRA
- NRA must ensure water resources aren't depleted
- Flow gauges to monitor flow
- Use of chemical sampling and biological sampling points
- Use made of the Harmonised Monitoring Network (HMN)
- NWW monitors water supply reservoirs as well as some education establishments

ii> Groundwaters;
NRA is responsible for boreholes

iii>Coastal Waters;
* Monitoring of most of the discharge to surface water is the NRA's responsibility
* Sewage is usually the responsibility of the NRA

iv>Drinking Water;
NWW monitors the drinking water
- **The NRA publishes annual surveys of river quality. Providing information on what constitutes a good/bad river.**
- **NRA also produces a Biological Quality Survey map. Here the rivers are ranked in four categories (Class A-D).**
- **Water Quality Sampling - Annual Reports: The water supply regulations 1989 requires water undertakers to produce an annual report that summarises information on the quality of water supply etc.**
- **Relaxations and Undertakings - Regulation 4 under the Water Supply Regulations 1989 relaxes the standards of wholesomeness**

and gives water undertakers relief from enforcement action.
- **Water Sampling Results 1991 - Looks into parameters that have contravened the Prescribed Concentration or Value (PCV) in one or more of the water supply zones. The PCV are set out in the Water Supply Regulations 1989.**

* B) Quality of rivers and streams - (14 pages)
# DoE has defined hydrometric areas as a basis for examining river systems
# Detailed information of the quality of the rivers is presented
# Used information from the 1985 National River Survey, NRA 1989 NWC survey and summary sample statistics 1980-90
# Main water quality problems are recognised including; organic pollution and nutrient enrichment
# Information is provided on all of the main rivers in the locality and their tributaries

- **Fishery Survey - Fishery Survey carried out by the NRA every three years (last one 1992). Rivers are divided into classes on the mean fish biomass values; Class A represents the highest and D the lowest.**

C) Quality of Standing Waters - (1.5 pages)
Examines the quality of; lakes, reservoirs, ponds and pits and canals

* D) Quality of Groundwaters - (1 page)
# NRA carries out limited bore hole monitoring

- **1992 the NRA produced a report setting out its policies for the protection of groundwater. Sets out how the NRA will meet its statutory responsibilities for the protection and conservation of groundwater resources.**
- **Sets out the structure of the policy framework**
- **The NRA has set out eight sections of policy objectives with the respect to different types of threat to groundwater resources.**

E) Quality of Estuarine and Coastal Waters - (6 pages)

F) Quality of Offshore Waters in the Irish Sea - (3 pages)

* <u>WATER POLLUTION - SOURCES AND IMPACTS</u>

Effluent comes from three sources; trade operations, agricultural activities and sewage, with sewage being the most numerous
Principle discharges requires NRA consent

- **There is a maximum permitted number of samples that can fail before a works is classified as failing to comply with its discharge consent.**
- **The number permitted depends on how many samples are taken in the year.**

A) Discharges - (2.5 pages)
Three aims of sewage treatment;
    # Removal of faecal, organic and other solids by screening and/or settlement and the production of sewage sludge

    # Removal of dissolved and suspended organic material by converting to biological material and its subsequent settling to produce secondary sludge
    # Final effluent with a low level of BOD and suspended solids to minimise impact on receiving waters

* Criteria for NRA discharge consent

B) Trade Discharges - (1/2 page)

Trade discharges can contain a wide range of potentially polluting elements
The more significant discharges are consented and monitored by the NRA

C) Agricultural Discharges - (2 pages)

Impair the quality of water quality
Agricultural pollution may lead to prosecution

- **Pollution Incidents - Statistics are produced on pollution incidents.**

<u>WATER BORNE INFECTIONS - 3/4 page</u>

Gut and various other pathogens enter the water directly/indirectly via sewage treatment works. Removal of pathogens is limited and there are no biological standards
Pathogenic bacteria and protozoa can remain viable for variable lengths of time - they may be ingested by humans and animals
Three main types of water-borne pathogens; leptosprire, salmonella and cryptosporidium

<u>BACTERIA AND VIRUSES IN RIVERS</u> - 1/4 Page

Monitoring programme of bacteriological quality of the river
No formal standards apply to non-designated bathing waters but rivers may still be subject to regular recreational and amenity use, so ingestion of water may occur

Acidification - (1/2 page)
NNW have completed a study for the Doe examining the extent and effects of acidification in Cumbria and South Pennines

Eutrophication - (1 page)
NRA national programme to monitor presence of potentially toxic blue-green algae at 500 sites

Radioactive Discharges - (2.5 pages)
Nuclear installations discharge liquid radioactive effluents to surface waters

* <u>DRINKING WATER QUALITY -</u> (10 pages)

* <u>WATER ABSTRACTIONS</u> - (2 pages)

Abstractions controlled by the NRA
All regular abstractions require a licence except for domestic or agricultural abstractions of less than 200 litres a day
Six main groups of water abstractors;
    - mains water supply
    - private water supply
    - agricultural uses
    - spray irrigation
    - industrial use
    - misc
- **Statistics presented on water consumption**
- **Information provided on the greatest users**

* FLOOD DEFENCE - (3/4 page)

Mainly the responsibility of the NRA
NRA has a major capital works programme for improving flood defence
- **Drought began August 1988 and lasted until 1992. Effect on aquifers and chalk watertable.**

FUTURE WATER RESOURCES

- **It has been stated that the most likely local water resources development for the future use in the Central Area are;**
    - **A) Chalk and sandstone aquifers, which still have substantial potential.**
    - **B) Construction of the Browhill Tunnel to increase Graham yield.**
    - **C) Widespread river support pumping.**

LANCASHIRE GREEN AUDIT/THE BEDFORDSHIRE ENVIRONMENT REPORT.

A comparison with "The Bedfordshire Environment Forum".

IT SHOULD BE NOTED THAT WATER AND WATER RELATED ITEMS, IS NOT REALLY MENTIONED ELSEWHERE WITHIN THE DOCUMENT.

EXPLANATION OF METHOD

The following presents a summary of the contents of the Lancashire Green Audit and The Bedfordshire Environment Report. It looks at the chapters other than the main Water chapter. Where a # appears next to the text it represents a point that is contained within the Lancashire Plan but not within the Hertfordshire document. A * represents information that is contained within both documents. Finally, the text which appears in bold is that which appears within the Bedfordshire plan only.

CHAPTER TWO - The structure of Lanc's environment

Pg 16 - (1 paragraph) River valleys - major landscape features and corridors for human settlement and movement. States the main valley systems with regards to the county's drainage and effluent system, also recreational resources and wildlife habitat.

* Pg 20/**Pg 11** - (2 paragraphs) Rainfall - States the wettest and driest months.
- **Drought - details of percentages of national average rainfall that falls in S.E**

CHAPTER THREE - Air

Pg 53/ - (1 page) Acid Rain - Long term effects on freshwater, groundwater, soils, forests, crops and buildings. Power stations and industrial process vehicle emissions. Effects of acid rain on the county.

Pg 54/ - (1.5 pages) Global Warming and Sea Levels - Intergovernmental Panel on Climate Change.

CHAPTER FIVE - Waste

Pg 142/ (1/2 page) Groundwater and Surface Water Contamination - Uncontrolled discharge of leachate can lead to fishkills. NRA monitors surface water and will prosecute. Contaminated groundwater is very serious and can effect drinking water quality. FOE report identifying contaminated sites ie those 'posing some risk to groundwater' but lack of conclusive evidence.

CHAPTER SEVEN - Energy

Pg 176/ - (3/4 page) Energy from Water - Three types of water generated energy sited; hydro-electric power. tidal power and wave energy. Consideration of sites for an hydro-electric power station.

Pg 181/ - (1/2 page) Acid Rain and Global Warming - Both need to be monitored with regards to energy consumption.

CHAPTER EIGHT - Land and Agriculture

Pg 203 - (1 paragraph) Inland water - Distribution

Pg 206 - (1.5 pages) Commercial Fisheries - The importance of rivers, canals and ponds for coarse and game fishing. Salmon presence. Commercial fishing as a local employer.

Pg 209 - (1.5 pages) Environmental Effects - Agricultural pollution of water - fertilizers and pesticide application leads to hyper eutrophication of the watercourse. Farm yard washings and dairy parlour washings constitute another pollution source.

CHAPTER NINE - Wildlife

Pg 232/ - (2 pages) - Freshwater Habitat - Presence of lakes and public supply reservoirs.

Pg 234/ - (2.5 pages) - Coastal Habitats - Six basic habitat types; mudflats and sandflats, saltmarshes, sand beaches and dunes, low clay cliffs, small stretch of rocky cliffs and limestone cliffs.

Pg 238/ - (1 paragraph) - Streamsides - Discusses lack of tree and shrub cover.

CHAPTER TWELVE - Transport

Pg 304 - (2 paragraphs) - Canals -The presence of canals.
Pg 309/ - (1/2 page) - Effects on water of road building ie, how it can effect drainage patterns of an area, affecting watercourses and groundwater levels.

CHAPTER THIRTEEN - Issues for the Future of Lanc's Environment

Pg 315 - (1.5 pages) - Water Quality Issues (13.4)
Also points; 13.3.12, 13.3.16, 13.3.17 - Air Quality Issues
13.5.44, 13,5.48, - Waste Issues
13.7.78 - Energy Issues
13.8.90, 13.8.91, 13.8.92 - Land & Agriculture
13.9.104, 13.9.106, 13.9.107 - Wildlife Issues

APPENDIX D - Pg 327 - Drinking Water Supply Zones in Lanc's 1990.

APPENDIX THREE

MAIN HEADINGS - Chapter Four (Water) Lancashire Green Audit / Chapter Nine The ESSEX ENVIRONMENT

EXPLANATION
The following shows a summary of the main headings within the Lancashire Green Audit and The Essex Environment. The text with a # next to it represents that which is only contained within the Lancashire document. That with a * alongside determines information that is contained within both documents. And finally, text which appears in bold print is that which is found within the Essex plan only.

* INTRODUCTION	
* LEGISLATION	* European measures * United Kingdom
* ORGANISATIONS	* Central Government # Water supply & sewerage company * Local Government * Other organisations - **Private sector**
- WATER QUALITY IN LANCS	* Water Quality Monitoring # Inland surface waters # Groundwaters * Coastal waters * Discharges * Drinking water
- **RESULTS OF WATER QUALITY TESTING**	- **Essex water company** - **Lee Valley** - **Tendring Hundred** - **Thames Water** - **Anglian Water**
	- Quality of Rivers & Streams - Introduction # NWC river classification * General assessment of river quality - River Keer - River Lune & tribs - River Wyre & tribs - River Ribble & tribs - River Douglas & tribs - River Irwell & tribs - **Essex River Quality** - **River Quality Achieved**
	- Quality of Standing Waters # Lakes

	# Reservoirs # Ponds & pits # Canals
	- Quality of Groundwaters
	# Quality of Estuarine & Coastal Waters # Lune estuary # Wyre estuary # Ribble estuary # Morecambe Bay # Coastal waters * Bathing waters **The Tidal Thames** **- Purfleet** **- West Thurrock** **- Mucking** **- Canvey Beach** **- Southend** **- Shoeburyness East**
	# Quality of Offshore Waters in the Irish Sea # Inputs of pollutants # Impact of pollutants
Water Pollution Sources & Impacts	# Introduction * Discharges * Trade discharges * Agricultural discharges # Water-borne infections # Bacteria & viruses in rivers # Acidification # Eutrophication * Radioactive discharges
* Drinking Water Quality	# Introduction **- Supply networks** * Prescribed concentrations or values * Relaxations & undertakings * Lead # Aluminium # Total coliforms * Iron # Hydrogen ion # Colour & turbidity # Trihalomethanes # Private water supplies **- Nitrate and Ammonia concentrations** **- Pesticide concentrations**
* Water Abstractions	**- Water abstractions** **- Water pollution incidents**

Flood Defence

- Problems and Issues	**- Adequacy of information** **- Drinking water quality** **- River water quality** **- Bathing water quality** **- Water pollution incidents** **- Bradwell nuclear power station**
- APPENDIX	**- Water Supply Zones in Essex**

LANCASHIRE GREEN AUDIT - CHAPTER FOUR SUMMARY (WATER) AND THE ESSEX ENVIRONMENT - CHAPTER NINE SUMMARY (WATER)

Explanation

The following shows a summary of the information contained within the Lancashire Green Audit and the Essex Environment. The text with a # next to it represents that which is only contained within the Lancashire document. That with a * alongside determines information that is contained within both documents. And finally, text which appears in bold print is that which is found within the Essex plan only.

*** INTRODUCTION** - (1/2 a page)

* The need for water eg. domestic consumption, agricultural, waste disposal etc
# Increase in domestic water consumption
# Quality of water determined by natural characteristics and human activity
* Pollution

*** LEGISLATION** - (1.5 pages)

* **A) European Measures;**
* Water pollution Directives concerning dangerous substances and quality
* List I (Black List) - 129 substances and UK Red List (23 of these 129 substances)
* List II (Grey List)
* Directives concerning surface waters used for drinking, recreation and harvesting freshwater fish and shellfish
* Directives concerned with bathing water quality

* **B) United Kingdom;**
* Water Act 1989
* Specific parts of the Water Act sited of particular importance, these being; S52, S54, S67-74, S107-116, S123
* States the major aims of the National Rivers Authority (NRA), specifically the aim of regular monitoring
- **Water Supply (Water Quality) Regulations 1989**

*** ORGANISATIONS** - (3/4 page)

* A) Central Government
* Government responsible for applying EC directives
* NRA - primary national organisation for the control of water resources. States the role of the NRA
* Drinking water inspectorate - quality of mains water and for ensuring water supply
- **DoE is responsible for applying EC directives**

B) Water Supply and Sewerage Company
North West Water (NWW) - supplying drinking water, treating and

disposing of sewage
Mains water quality

C) Local Government
Role of District Council's environmental health departments
County council has no direct regulatory role

* D) Other Organisations
* Many organisations involved eg. FoE
- **MAFF controls commercial fisheries and pollution inputs to offshore waters**

* <u>WATER QUALITY IN LANCASHIRE</u> - (2.5 pages)

* A) Water Quality Monitoring
# Extensive monitoring system - existing for a number of years. Different systems encountered within the following areas;

i> Inland surface waters;
- All monitoring is the responsibility of the NRA
- NRA must ensure water resources aren't depleted
- Flow gauges to monitor flow
- Use of chemical sampling and biological sampling points
- Use made of the Harmonised Monitoring Network (HMN)
- NWW monitors water supply reservoirs as well as some education establishments

ii> Groundwaters;
NRA is responsible for boreholes

iii>Coastal Waters;
* Monitoring of most of the discharge to surface water is the NRA's responsibility
* Sewage is usually the responsibility of the NRA

iv>Drinking Water;
NWW monitors the drinking water
<u>-Supply networks</u>
- **Sources of main drinking water**
- **Water supply system organised in Water Supply Zones (WSZs)**
<u>- Prescribed Concentrations or Values</u>
- **Role of EC directives in specifying water standards**
- **Water quality monitoring by various water companies**
<u>- Relaxations and Undertakings (R&U)</u>
- **R&U can be given to a water company to avoid enforcement action**

- **Results of Water Quality Testing; - Refers to report "Drinking Water 1990" which outlines water quality information related to samples taken in 1990. Gives the results of microbiological quality testing for the water supply companies covering Essex. The broad results for each company os stated.**

* B) Quality of rivers and streams - (14 pages)
# DoE has defined hydrometric areas as a basis for examining river systems
* Detailed information of the quality of the rivers is presented
# Used information from the 1985 National River Survey, NRA 1989 NSC survey and summary sample statistics 1980-90
# Main water quality problems are recognised including;

organic pollution and nutrient enrichment
Information is provided on all of the main rivers in the locality and their tributaries

- **River Quality Assessment**
  - **Essex River Systems**
  - **Details of Essex's flowing waters**
  - **River quality Achieved**
  - **Quality is monitored by the NRA. They are classified according to the system developed by the National Water Classification system.**
  - **Details of classification for Thames and Anglian region.**

C) Quality of Standing Waters - (1.5 pages)
Examines the quality of; lakes, reservoirs, ponds and pits and canals

D) Quality of Groundwaters - (1 page)
- NRA carries out limited bore hole monitoring

E) Quality of Estuarine and Coastal Waters - (6 pages)
- **The Tidal Thames**
  - **Monitored by the NRA**
  - **Network of automatic quality monitoring stations have been set up**
  - **Details given of the results of monitoring found in the annual report (year ending 1990)**

F) Quality of Offshore Waters in the Irish Sea - (3 pages)
- **Bathing water quality**
  - **Definition of bathing waters**
  - **NRA monitors during the bathing season**
  - **Details of compliance with EC directives**

* WATER POLLUTION - SOURCES AND IMPACTS

* Effluent comes from three sources; trade operations, agricultural activities and sewage, with sewage being the most numerous
* Principle discharges requires NRA consent

*A) Discharges - (2.5 pages)
* Three aims of sewage treatment;
  * Removal of faecal, organic and other solids by screening and/or settlement and the production of sewage sludge
  * Removal of dissolved and suspended organic material by converting to biological material and its subsequent settling to produce secondary sludge
  * Final effluent with a low level of BOD and suspended solids to minimise impact on receiving waters
* Criteria for NRA discharge consent
- **Details of the sewage treatment system**
- **Details of permitted failures to comply with consented sewage discharges**
- **Outfalls into the sea**

* B) Trade Discharges - (1/2 page)

Trade discharges can contain a wide range of potentially polluting elements
* The more significant discharges are consented and monitored by the NRA
- **Different methods in which trade effluent is disposed of.**

* C) Agricultural Discharges - (2 pages)

Impair the quality of water quality
Agricultural pollution may lead to prosecution
- **Detailed of the increase in agricultural pollution incidents and reasoning**
- **Some chemicals can lead to eutrophication**
- **Details of measures being undertaken to tackle these problems**

<u>WATER BORNE INFECTIONS - 3/4 page</u>

Gut and various other pathogens enter the water directly/indirectly via sewage treatment works. Removal of pathogens is limited and there are no biological standards
Pathogenic bacteria and protozoa can remain viable for variable lengths of time - they may be ingested by humans and animals.
Three main types of water-borne pathogens; leptosprire, salmonella and cryptosporidium

* <u>BACTERIA AND VIRUSES IN RIVERS</u> - 1/4 Page

Monitoring programme of bacteriological quality of the river
No formal standards apply to non-designated bathing waters but rivers may still be subject to regular recreational and amenity use, so ingestion of water may occur

Acidification - (1/2 page)
NWW have completed a study for the Doe examining the extent and effects of acidification in Cumbria and South Pennines

Eutrophication - (1 page)
NRA national programme to monitor presence of potentially toxic blue-green algae at 500 sites

* Radioactive Discharges - (2.5 pages)
* Nuclear installations discharge liquid radioactive effluents to surface waters
- **MAFF undertakes an annual environmental monitoring programme to record radiation levels. Data is presented using Systeme Internationale Radiological Units recommended for use in the UK.**
- **Those who are likely to receive the highest levels of exposure.**

* <u>DRINKING WATER QUALITY -</u> (10 pages)

* <u>WATER ABSTRACTIONS</u> - (2 pages)

* Abstractions controlled by the NRA
* All regular abstractions require a licence except for domestic or agricultural abstractions of less than 200 litres a day

Six main groups of water abstractors;
- mains water supply
- private water supply
- agricultural uses
- spray irrigation
- industrial use
- misc

FLOOD DEFENCE - (3/4 page)

Mainly the responsibility of the NRA
NRA has a major capital works programme for improving flood defence

PROBLEMS AND ISSUES

- There are a number of issues;

- **Adequacy if Information**
- **Only a few major organisations monitor the potential and actual problems of pollution. The data is often not readily available for public access.**
- **Absences of good quality monitoring information at the local level is cause for concern**
- **Drinking Water Quality**
- **River Water Quality**
- **Some commentators have criticised the 1990 Survey as being broad and vague**
- **Bathing Water Quality**
- **Water Pollution Incidents**
- **Agricultural pollution incidents are often very serious because of the highly polluting nature of many farm effluents**
- **Bradwell Nuclear Power Station**

LANCASHIRE GREEN AUDIT/THE ESSEX ENVIRONMENT

A comparison with "The Essex Environment".

EXPLANATION OF METHOD

The following presents a summary of the contents of the Lancashire Green Audit and the Report on the State of Hertfordshire's Environment. It looks at the chapters other than the main Water chapter. Where a # appears next to the text it represents a point that is contained within the Lancashire Plan but not within the Essex document. A * represents information that is contained within both documents. Finally, the text which appears in bold is that which appears within the Essex plan only.

CHAPTER TWO - The structure of Lanc's environment

Pg 16 - (1 paragraph) River valleys - major landscape features and corridors for human settlement and movement. States the main valley systems with regards to the county's drainage and effluent system, also recreational resources and wildlife habitat.

* Pg 20/**Pg 9** - (2 paragraphs) Rainfall - States the wettest and driest months.

CHAPTER THREE - Air

* Pg 53/**Pg 16** - (1 page) Acid Rain - Long term effects on freshwater, groundwater, soils, forests, crops and buildings. Power stations and industrial process vehicle emissions. Effects of acid rain on the county.

- Pg 16 - Warren Spring Laboratory monitors rainfall acidity at 59 UK sites

- Pg 16 - An increase in the natural water acidity is usually accompanied by an increase in aluminium concentrations. It has an effect on fish and other water life.

* Pg 54/ **Pg15** - (1.5 pages) Global Warming and Sea Levels - Intergovernmental Panel on Climate Change.

- Pg 15 - Global warming threatens sea levels. Predictions of effects are based on uncertainty. Effect on low lying areas may lead to new flooding zones. Efficiency of groundwater and sewage drainage water will be decreased. Long dry spells will be more frequent and dramatic

CHAPTER FIVE - Waste

* Pg 142/ **Pg 56** (1/2 page) Groundwater and Surface Water Contamination - Uncontrolled discharge of leachate can lead to fishkills. NRA monitors surface water and will prosecute. Contaminated groundwater is very serious and can effect

drinking water quality. FOE report identifying contaminated sites ie those 'posing some risk to groundwater' but lack of conclusive evidence.

- **Pg 56 - Site licences requires operators to monitor surface water on and around the site.**

CHAPTER SEVEN - Energy

* Pg 176/**Pg 73** - (3/4 page) Energy from Water - Three types of water generated energy sited; hydro-electric power. tidal power and wave energy. Consideration of sites for an hydro-electric power station.

* Pg 181/ **Pg 74** - (1/2 page) Acid Rain and Global Warming - Both need to be monitored with regards to energy consumption.

- **Pg 74 - The potential of kinetic energy in water has to be converted into electricity. If all reasonably practical estuaries were exploited, tidal power could generate about 50,000 million kilowatt hour units.**

CHAPTER EIGHT - Land and Agriculture

Pg 203 - (1 paragraph) Inland water - Distribution

Pg 206 - (1.5 pages) Commercial Fisheries - The importance of rivers, canals and ponds for coarse and game fishing. Salmon presence. Commercial fishing as a local employer.

Pg 209 - (1.5 pages) Environmental Effects - Agricultural pollution of water - fertilizers and pesticide application leads to hyper eutrophication of the watercourse. Farm yard washings and dairy parlour washings constitute another pollution source.

CHAPTER NINE - Wildlife

* Pg 232/**Pg 99** - (2 pages) - Freshwater Habitat - Presence of lakes and public supply reservoirs.

- **Pg 99 - Freshwater - Divided into two main types; standing waters and running waters. Gives details of the watercourses within the area, also details of flora and fauna.**

* Pg 234/ **Pg 99** - (2.5 pages) - Coastal Habitats - Six basic habitat types; mudflats and sandflats, saltmarshes, sand beaches and dunes, low clay cliffs, small stretch of rocky cliffs and limestone cliffs.

- **Pg 99 - Details of the five basic coastal habitats - Mudflats and sandbanks, saltmarshes, shell and shingle spits, grazing marshes and seawall and grassland.**

* Pg 238/ **Pg 113** - (1 paragraph) - Streamsides - Discusses lack of tree and shrub cover.

- **Pg 113 - Decrease in the number of ponds. Run-off from ponds can cause problems.**

CHAPTER TWELVE - Transport

Pg 304 - (2 paragraphs) - Canals -The presence of canals.

* Pg 309/ **Pg 149** - (1/2 page) - Effects on water of road building ie, how it can effect drainage patterns of an area, affecting watercourses and groundwater levels.

- **Pg 139 - Inland Waters - Details of the main waterways. Details of commercial activities. Details on the main uses of each of the main waterways.**

- **Pg 140 - Seaports - Details of the two major international ports within the area.**

- **Pg 149 - Water pollution and drainage - Danger of major accidents involving the movement of dangerous substances.**

CHAPTER THIRTEEN - Issues for the Future of Lanc's Environment

Pg 315 - (1.5 pages) - Water Quality Issues (13.4)
Also points; 13.3.12, 13.3.16, 13.3.17 - Air Quality Issues
13.5.44, 13,5.48, - Waste Issues
13.7.78 - Energy Issues
13.8.90, 13.8.91, 13.8.92 - Land & Agriculture
13.9.104, 13.9.106, 13.9.107 - Wildlife Issues

APPENDIX D - Pg 327 - Drinking Water Supply Zones in Lanc's 1990.

CHAPTER TEN - OUTDOOR RECREATION - INLAND AND COASTAL

- **Pg 127 - Coastal water recreation in Essex - Sailing activities**
  - **Water skiing**
  - **Windsurfing**
  - **Sailboarding**
  - **Jet skiing**
  - **Wild fowling**
  - **Sea angling**
  - **Informal coastal recreation**

- **Pg 130 - Inland water recreation**
  - **Inland rivers and canals**
  - **Enclosed waters**
  - **Other enclosed waters**
  - **Waters sports on inland waters**

- **There may be activity conflict**

APPENDIX FOUR

Refers to Table Three

WATER QUALITY STRATEGY:

1 - length of river, canal and estuary in each water quality class
2 - compliance with the requirements of all EC Directives which set conditions and standards for water quality
3 - achievement of SWQOs
4 - compliance of discharges from industry and agriculture with consent conditions
5 - reductions in the quantity of hazardous substances discharged into the North Sea
6 - reductions in the number of substantiated pollution incidents

WATER RESOURCES STRATEGY:

1 - preparation and realisation of a sustainable water resources development strategy
2 - reductions in the length of over-abstracted rivers suffering unacceptable low flows due to excessive abstractions
3 - compliance of abstractions with licence conditions

FLOOD DEFENCE STRATEGY:

1 - length of Main River classified according to use made of the flood plain (i.e. land use band)
2 - land Use Bands protected to appropriate standard
3 - floodplain protected by maintenance and improvement work
4 - completion of s105 surveys as agreed with planning authorities
5 - length of Flood Defence improved
6 - percentage of properties warned prior to flooding occurring
7 - amount of development on unprotected floodplain

FISHERIES STRATEGY:

1 - number of licensed fishermen
2 - number of licence checks made
3 - number of fisheries offenses detected
4 - number of monitoring surveys undertaken
5 - number of habitat improvement structures built
6 - number of fish reared and stocked
7 - salmon and sea trout catches
8 - coarse fish abundance
9 - juvenile salmonoid fish abundance

CONSERVATION STRATEGY:

1 - length of rivers, coasts and associated lands classified according to conservation interest
2 - percentage of applications requiring NRA authorization (consents and licences) screened and appraised for the effectiveness of conservation advice
3 - percentage of Environmental Statements and Development Plans and planning applications screened and appraised

4 - implementation of management plans for NRA sites
proportion of water related SSSIs maintained through regulatory and operational activity
5 - proportion of degraded habitats enhanced and rehabilitated
6 - achievement of conservation objectives in catchment plans

RECREATION STRATEGY:

1 - availability of public access to NRA landholdings
2 - number of NRA sites suitable for recreation
3 - usage of NRA sites
4 - proportion of collaboration on Recreation projects
5 - proportion of NRA capital works screened for recreation opportunities
6 - measures of public satisfaction