

LIST OF R&D OUTPUTS



SEPTEMBER 1989  
TO  
SEPTEMBER 1995

THE NATIONAL RIVERS AUTHORITY'S R&D PROGRAMME

Welcome to the fourth edition of the List of R&D Outputs. This document provides an updated and revised catalogue of outputs produced through the National Rivers Authority's Research and Development Programme. The purpose of the Programme is to improve the efficiency and effectiveness of the NRA in carrying out its business. The sections set out below supply brief details of all outputs completed in the period September 1989 to September 1995. Details of the terminology used, the cost of these outputs available to the public domain and how many copies may be obtained are provided on page 22.

Project No.	Output Ref.	Title	Availability		Date	Uptake Route
			Internal	External		
<b>COMMISSION A: WATER QUALITY</b>						
001/012	Note 302	The development of macroinvertebrate keys using TWINSPAN classification: A manual for NRA biologists	✓	✓	1994	Operational
	Project Record 001/13/W	Sources of farm pollution and impact on river quality - vols I, II (appendices) and map annex	✗	✗	1994	Operational
	Report 19	Detection of organic farm pollution - The use of a biological technique for the detection and monitoring of farm pollution <i>Available from NRA Regions free of charge</i>	✓	✓	1995	Operational
002	PRS 2125-M	Granta catchment pesticide study - Survey of pesticide use, 1987-88	✓	✓	1989	Operational
	Note 72	Pesticides in major aquifers	✓	✓	1992	Operational
003	P-22	Impact of lowland forestry on water quality	✓	✓	1990	Understanding
004	P-39	Review of the effects of afforestation on upland water quality	✓	✓	1990	Operational
	P-79	Nutrient enrichment of Scottish lochs and reservoirs, with particular reference to the impact of forest fertilisation	✓	✓	1990	Understanding
005	P-4	Environmental impact of fish farming -Review	✓	✓	1989	Policy
006	P-35	Impact of land use on water quality -Review of available models	✓	✓	1990	Operational
007	Note 118	Pollution risk assessment	✓	✓	1992	Operational
10	P-71	An investigation of the use of biological information in national water quality classification	✓	✓	1990	Policy
	Project Record 10/8/N	Environmental Quality Standards to protect identified uses of controlled waters - General and special ecosystems	✓	✓	1993	Policy
	Project Record 10/9/N	Environmental Quality Standards to protect identified uses of controlled waters - Salmonid, cyprinid and migratory fisheries - Commercial harvesting of marine fish/shellfish for public consumption	✓	✓	1992	Policy
	Project Record 10/10/N	Environmental Quality Standards to protect identified uses of controlled waters - Uses 9-14	✓	✓	1993	Policy
011	P-8	Biological methods for water quality assessment	✓	✓	1989	Operational
013	Note 123	Intermittent pollution - Combined sewer overflows, ecotoxicology and water quality standards	✓	✓	1992	Policy
14	P-34	Oxygen balance in estuaries: Review and analysis	✓	✓	1990	Understanding

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015	Project Record 015/13/T	Atmospheric Inputs to Surface Waters - Literature review and field data	✓	✗	1994	Operational
	Report 20	Atmospheric Sources of Pollution - inputs of trace organics to surface waters (ISBN 1873160 24 0)	✓	✓	1995	Operational
			<i>Available from FWR (01628 891589)</i>			
016	P-7	Investigation of partitioning of contaminants between water and sediment	✓	✓	1989	Understanding
	P-12	Trace metals in the Severn Estuary - A reappraisal	✓	✓	1992	Understanding
	Note 66	Investigation of partitioning between water and sediment	✓	✓	1992	Understanding
	Project Record 16/8/N	Investigation of partitioning between water and sediment	✓	✓	1992	Understanding
017	Note 201	The effects of partitioning on toxicity	✓	✓	1995	Understanding
018	P-106	Transport and fate of organic pollutants in rivers - Final report	✓	✓	1990	Understanding
	PRS 2582-M	A review of environmental fate and transport models	✓	✓	1990	Understanding
020	P-3	Estuarine cohesive sediment dynamics - Literature review with special reference to modelling	✓	✓	1989	Understanding
	NR 2722 - Final report	Particle-bound contaminant transport model	✓	✓	1991	Operational
	P-88	Particle-bound pollutant transport model - METAL 2 (v2.05) - User guide	✓	✓	1991	Operational
021	P-31	Modelling of pollutant behaviour for toxicity and population effects	✓	✓	1990	Understanding
	Note 129	Modelling of pollutant behaviour in individuals and populations	✓	✓	1992	Understanding
022	P-61	SIMCAT consent setting model - User guide	✓	✓	1990	Operational
	P-62	Model for consent conditions for continuous discharges	✓	✓	1990	Operational
023	P-104	Determination of ecotoxicological effects - Review of the toxicity of common pollutants to fish - No. 1. Ammonia, arsenic and cadmium	✓	✓	1990	Policy
	Note 82	Toxicity of common pollutants to freshwater aquatic life - A review of the effects of ammonia, arsenic, cadmium, chromium, copper, cyanide, nickel, phenol and zinc on indigenous species	✓	✓	1992	Policy
	Note 83	Predicting the toxicity of ammonia to freshwater fish	✓	✓	1992	Policy
	Project Record 23/12/T	Ecotoxicological effects	✓	✗	1994	Policy
024	Project Record 24/1/T	Methods for assessing the toxicity of sediment-bound contaminants	✓	✓	1992	Operational
030	PRS-2457	Disease and contaminants in marine mammals	✓	✓	1990	Understanding
034/036	NR 2556	Interim guidelines on the ranges of enteric organism decay rates (T90s) under different marine conditions	✓	✓	1990	Operational
	P-28	Factors affecting the survival of enteric organisms in aquatic environments	✓	✓	1990	Understanding
	P-32	Principal sources of microbiological contamination - Microbial inputs to upland surface waters from agriculture	✓	✓	1990	Understanding
035	PRS 2216-M	Preliminary investigations into analysis of stressed bacteria	✓	✓	1989	Understanding
037	PRS 2313-M	Health risks of freshwater recreation - Development of microbiological standards	✓	✗	1989	Policy
	Note 165	Development of microbiological standards	✗	✗	1993	Policy
038	Note 43	Sewage disinfection - By-product formation, ecotoxicology and microbiological efficacy	✓	✓	1991	Policy
040	P-21	Detecting changes in groundwater quality Monitoring requirements	✓	✓	1990	Operational
041	PRS 2270-M	Draft code of practice for analytical quality control in NRA laboratories	✓	✓	1989	Operational
042	PRS 2493	Alternative strategies to BOD	✓	✓	1990	Policy

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043	Note 5	Development of integrating and sentinel samplers	✓	✓	1991	Operational
044	PRS 2273-M	Interim review of data handling and information needs of regulatory agencies	✓	✓	1989	Understanding
045	P-70	Effects on <i>Gammarus</i> of sediments impacted by watercress farms	✓	✓	1990	Operational
046	P-57	PILCHARD - Computer program for fitting trends to water quality data	✓	✓	1990	Operational
	Note 18	Software for water quality data interpretation-Summary of statistical software produced during the contract	✓	✓	1991	Operational
047	PRS 2304	New biological methods for assessing episodic pollution	✓	✓	1989	Operational
048	P-1	Discharge control by direct toxicity assessment (DTA) - Discussion document	✓	✓	1989	Policy
	P-2	Discharge control by direct toxicity assessment (DTA) - Interim protocol	✓	✓	1989	Operational
049	P-23	Discharge control and monitoring by biological techniques - Case studies	✓	✓	1990	Policy
	P-41	Determination of the EC <sub>50</sub> of test substances to the Microtox reagent <i>Photobacterium phosphoreum</i>	✓	✓	1990	Operational
050	PRS 2272-M - Water quality	Instrumentation for monitoring by the NRA	✓	✓	1989	Operational
051	P-14	Control of nitrate and pesticides in seven EC member states	✓	✓	1990	Understanding
	P-37	House of Commons Committee on community legislation - Comments by WRC on the Municipal WasteWater Treatment proposal COM(89)518	✓	✓	1990	Understanding
	Note 19	Water protection zones to reduce nitrate in groundwater - Their role and effectiveness in five North European countries	✓	✓	1991	Policy
	Note 21	Controlling hazardous substances on the North Sea action list - Approach and monitoring in selected countries	✓	✓	1991	Policy
	Note 124	Control of pesticides in groundwater in The Netherlands and Germany - the effectiveness of the water protection zone approach	✓	✓	1993	Policy
	Note 125	The implementation of the EC Freshwater Fish Directive in member states	✓	✓	1993	Policy
	Note 259	Major water quality issues in France, Germany, The Netherlands and the EC	✓	✓	1994	Policy
	Note 260	Dissemination of information on water quality to the public - Approaches taken in other European countries	✓	✓	1994	Policy
	Note 261	Major water quality research programmes in France, Germany and The Netherlands	✓	✓	1994	Policy
	52	P-36	Comparison of charging practices for effluents in three EC member states	✓	✓	1990
53	P-11	UK water quality standards arising from EC directives - An update	✓	✓	1989	Policy
	PRS 2309-M	Candidate substances requiring Environmental Quality Standards (EQSs) - December 1989	✓	✓	1989	Policy
	Note 130	Environmental Quality Standards for dissolved oxygen	✓	✓	1992	Policy
	Note 131	Proposed environmental quality standards for sodium, chloride and sulphate in fresh water	✓	✓	1990	Policy
	Note 132	Variability of pesticides in river water and its effect on estimation of load	✓	✓	1992	Understanding
	Note 200	Flue gas desulphurization effluents: Priorities for Environmental Quality Standard development	✓	✓	1993	Policy
	Note 216	Proposed Environmental Quality Standards for sheep dip chemicals in water: Chlorfenvinphos, coumaphos, diazinon, fenchlorphos, flumethrin and propetamphos	✓	✗	1993	Policy

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	Note 230	An assessment of the Environmental Quality Standards for inorganic nutrients necessary to prevent eutrophication (nuisance growth of algae)	✓	✗	1993	Policy
	Note 266	A review of the biocides most commonly used in industrial water systems in the UK	✓	✓	1994	Understanding
	Note 332	Proposed Environmental Quality Standards for chlorine in fresh and marine waters	✓	✓	1994	Policy
	Note 339	A review of fire fighting foams to identify priorities for Environmental Quality Standard development	✓	✓	1994	Policy
	Note 340	Timber treatment chemicals- priorities for Environmental Quality Standard development	✓	✓	1995	Policy
057	P-5	Guide to the use of control charts in water analysis	✓	✓	1989	Operational
	P-6	Examination of trace metal complexation in natural waters using a combination cathodic stripping voltammetry and computer simulation	✓	✓	1989	Operational
	P-10	Control samples for pH determination in low ionic strength waters - Suitability for analytical quality control	✓	✓	1989	Operational
	P-15	Development of ion chromatography for the analysis of saline samples	✓	✓	1990	Operational
	P-16	Examination of the range of copper complexing ligands in natural waters	✓	✓	1990	Operational
	P-17	Measurement of copper complexing capacity in marine and estuarine samples using a bacterial bioassay	✓	✓	1990	Operational
	P-18	Analysis of chromium in sea water by graphite furnace atomic absorption spectrometry	✓	✓	1990	Operational
	P-19	Comparison of load estimation from grab and flow-proportioning samples	✓	✓	1990	Operational
	P-20	Adsorption of trace metals during sample filtration - Laboratory and field tests	✓	✓	1990	Operational
	Project Record 57/8/W	Analytical quality control and method development	✓	✓	1993	Operational
061	P-25	New biological methods for assessing the effects of pollution	✓	✓	1990	Operational
	Note 170	The development of the <i>Gammarus pulex</i> feeding rate bioassay	✓	✓	1993	Operational
	Note 171	The development of the biochemical Glutathione - S - Transferase (GST) assay	✓	✓	1993	Operational
	Note 172	The development of an estuarine toxicity test using an indigenous mysid	✓	✓	1993	Operational
	Note 173	A preliminary evaluation of the shell valve activity monitor	✓	✓	1993	Operational
	Project Record 61/6/T	Biological methods for water quality assessment	✓	✓	1993	Operational
062	P-13	Cryptosporidium and water courses - Oocyst recovery and water course protection	✓	✓	1989	Understanding
	P-27	Analytical quality assurance in water microbiology	✓	✓	1990	Operational
	P-60	Evaluation of rapid detection kits for the isolation of Salmonellae	✓	✓	1990	Operational
	Note 93	Microbiological techniques - Coliform bacteria and <i>Escherichia coli</i>	✓	✓	1992	Operational
	Note 94	Microbiological techniques - Faecal streptococci	✓	✓	1992	Operational
	Note 95	Microbiological techniques - Salmonellae	✓	✓	1992	Operational
	Note 96	Microbiological techniques - Cytopathic culturable enteric viruses	✓	✓	1992	Operational
	Note 97	Microbiological techniques - Thermophilic campylobacters	✓	✓	1992	Operational
	Note 98	Microbiological techniques - Staphylococci	✓	✓	1992	Operational
	Note 99	Microbiological techniques - <i>Leptospira</i>	✓	✓	1992	Operational

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	Note 100	Microbiological techniques - Storage and pre-treatment of samples	✓	✓	1992	Operational
	Note 208	Microbiological techniques - Discrimination of human and animal pollution: a review	✓	✓	1993	Operational
	Note 209	Microbiological techniques - Microbial tracers	✓	✓	1993	Operational
	Note 234	Microbiological techniques - Rapid confirmation of coliform organisms and <i>Escherichia coli</i>	✓	✓	1993	Operational
	Note 254	Microbiological techniques - Sulphite-reducing clostridia	✓	✓	1994	Operational
	Note 255	Microbiological techniques - <i>Pseudomonas aeruginosa</i>	✓	✓	1994	Operational
	Report 2	Manual of standard methods for microbiological analysis	✓	✓	1995	Operational
			Price: £100.00			
063	P-33	Electrochemical immunoassay for atrazine	✓	✓	1990	Operational
	Note 10	Review of sensing techniques for <i>in situ</i> monitoring - Water chemistry	✓	✓	1991	Operational
	Project Record 63/9/ST	Evaluation of multiple parameter hand-held meters - Technical information	✗	✗	1992	Operational
	Project Record 63/10/ST	Evaluation of multiple parameter hand-held meters - Manufacturers' summaries	✗	✗	1992	Operational
104	Note 305	Sediment - water contaminant exchange	✓	✓	1995	Understanding
	Project Record 104/10/SW	Sediment - water contaminant exchange	✓	✓	1995	Understanding
105	Note 203	Effects of sediment metals on estuarine benthic organisms - A study of TBT, mercury and other heavy metals	✓	✓	1994	Understanding
	Project Record 105/2/A	Effects of sediment metals on estuarine benthic organisms - A study of TBT, mercury and other heavy metals	✓	✓	1994	Understanding
106	Project Record 106/1/NW	Mersey Estuary - An assessment of the biological status of intertidal sediments	✓	✓	1991	Operational
107	Note 306	Fate of organic micropollutants in estuaries	✓	✓	1994	Operational
	Project Record 107/10/SW	Fate of organic micropollutants in estuaries	✓	✓	1994	Operational
109	Note 108	Nitrate reduction for protection zones - The role of alternative farming systems	✓	✓	1992	Operational
113	Project Record 113/10/ST	Diffuse pollution from land-use practices	✓	✓	1993	Operational
114	Note 77	Forestry impact on upland water quality	✓	✓	1992	Operational
	Project Record 114/5/W	Forestry impact on upland water quality - Supporting studies	✓	✓	1992	Understanding
117	Project Record 117/2/A	Environments of larger UK rivers	✓	✓	1992	Understanding
119	Note 404	Total impact assessment of pollutants in rivers basins - Pesticide Impact Modelling	✓	✓	1995	Policy
	Project Record 119/10/W	Pesticide run-off study ADAS Rosemaund Vol 4 Year 5-6	✓	✗	1995	Understanding
	Project Record 119/1/W	Pesticide run-off study ADAS Rosemaund Vol 1 Year 1-3	✓	✗	1995	Understanding
	Project Record 119/4/W	Pesticide run-off study ADAS Rosemaund Vol 2 Year 2-4	✓	✗	1995	Understanding
	Project Record 119/9/W	Pesticide run-off study ADAS Rosemaund Vol 3 Year 3-5	✓	✗	1995	Understanding
121	Note 20	Fine particles in rivers, related to dead zones - Implications for water quality	✓	✓	1992	Understanding
130	Note 46	Review of groundwater pollution of the chalk aquifer by the halogenated solvents	✓	✗	1992	Operational
	Note 47	Review of groundwater pollution of the Triassic sandstone aquifer by the halogenated solvents	✓	✗	1992	Operational
	Project Record 130/6/A	Review of groundwater pollution of the chalk and Triassic sandstone aquifers by the halogenated solvents - Annexes to R&D Notes 46 & 47	✓	✗	1992	Operational

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202	Project Record 202/1/A	Graphical display program for SIMCAT	✓	✓	1991	Operational
203	NR 2676	Ecotoxicology - New approaches	✓	✓	1991	Understanding
204	Note 30	Application of limit values in three EC member states	✓	✓	1991	Understanding
206	Note 328	Persistent organic compounds within the Mersey estuary - Environmental fate study	✓	✓	1994	Operational
208	Project Record	The disposal of sheep dip waste - Effects on water quality	✓	✓	1992	Operational
	Report 11	The disposal of sheep dip waste - Effects on water quality (ISBN 0 11 886518 8) <i>Available from HMSO Price £15.00</i>	✓	✓	1994	Operational
212	Note 104	Body burdens and toxicity - A review	✓	✓	1991	Understanding
215	Note 244	Method for the analysis of volatile organochlorine solvents (VOCl <sub>s</sub> ) in groundwater and river water using purge and trap gas chromatography-mass spectrometry	✓	✓	1994	Operational
215	Project Record 215/16/T	Methodology for organics analysis - Details of method development	✓	✓	1994	Operational
216	Note 88	Determination of trace metals in saline waters by high performance liquid chromatography	✓	✓	1992	Operational
218	Note 317	The determination of cadmium, copper, lead, nickel in natural waters by stripping voltammetry	✓	✓	1995	Operational
219	Note 86	Transport and fate of organic pollutants in rivers	✓	✓	1992	Understanding
	Project Record 219/7/Y	Transport and fate of organic pollutants in rivers - Detailed information	✓	✓	1992	Understanding
220	Project Record 220/3/T	Organisations involved in monitoring instrumentation standards and evaluations	✓	✓	1991	Understanding
	Project Record 220/4/T	Specification of NRA field test facilities for instrumentation assessment	✓	✓	1991	Operational
	Note 62	NRA instrumentation assessment and demonstration facilities - Final report	✓	✓	1992	Operational
	Project Record 220/6/T	Safe system of work - Fobney Mead field test facility safety procedures	✓	✓	1992	Operational
	Project Record 220/7/T	Protocol for investigation of ion-selective ammonium electrodes and their applications in field measurement	✓	✓	1992	Understanding
	Project Record 220/9/T	Instrument performance assessment standard test protocols - Revision A	✓	✓	1992	Operational
	Note 224	Monitoring equipment : test procedures	✓	✗	1995	Operational
222	Note 4	Value and scope for development of quantitative assessment methods for landfill proposals	✓	✓	1991	Understanding
224	Note 48	Mixing zone case study: Evaluation of mathematical model	✓	✓	1993	Policy
	Project Record 224/7/A	Mixing zone case study: Evaluation of mathematical model	✓	✓	1993	Policy
226	Note 15	Foaming in rivers - An initial assessment of the problems in the UK	✓	✓	1991	Operational
	Project Record 226/2/Y	Foaming in rivers - An initial assessment of the problems in the UK	✓	✓	1991	Understanding
227	Note 69	Metal speciation in rivers and estuaries: Copper	✓	✓	1992	Understanding
	Note 257	Metal speciation in rivers and estuaries: Zinc and chromium	✓	✓	1994	Understanding
228	P-116	Health effects of sea bathing - Phase 2 - Studies at Ramsgate and Moreton, 1990	✓	✓	1991	Policy
	DoE 3412/2	Health effects of sea bathing - Phase 3 <i>Available from WRc (01491 571531)</i>	✓	✓	1994	Policy
230	Note 239	Measures for protecting upland water quality - Assessment of forestry buffer strips	✓	✓	1993	Operational
	Project Record 230/16/W	Measures for protecting upland water quality - Assessment of forestry buffer strips	✓	✓	1994	Operational

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231	Project Record 231/6/SW	Efficacy and environmental effects of peracetic acid as a sewage disinfectant	✓	✓	1991	Policy
239	PRS 2274-M	Codes of practice for data handling - Discussion document	✓	✓	1989	Operational
	Note 241	Codes of practice for data handling - Version 1	✓	✓	1993	Operational
242	P-96	The faunal richness of headwater streams - A review of existing information	✓	✓	1991	Understanding
	Note 221	The faunal richness of headwater streams: Stage 2 - Catchment studies - Main report	✓	✓	1993	Understanding
	Note 221/A	The faunal richness of headwater streams: Stage 2 - Catchment studies - Appendices	✓	✓	1993	Understanding
	Note 392	The faunal richness of headwater streams: Stage 3 - Impact of agricultural activities	✓	✓	1995	Understanding
243	Interim Report 243/1/Y	Testing and further development of RIVPACS	✓	✓	1991	Operational
247	Note 321	Development of broad spectrum biosensors for effluent toxicity assessment	✓	✗	1995	Understanding
	Project Record 247/22/A	Development of broad spectrum biosensors for effluent toxicity assessment	✗	✗	1995	Understanding
251	Note 138	Quality control and sampling procedures	✓	✓	1992	Operational
254	Note 12	Fate and behaviour of chemical contaminants in the aquatic environment - A review of sources of information	✓	✓	1991	Understanding
259	Report 9	Farm waste storage - Guidelines for construction	✓	✓	1992	Operational
			<i>Available from CIRIA (0171 222 8891)</i>			
260	ALL OUTPUTS	Coastal sewerage programme. The information in these outputs has now been superceded - please see Project No. 464, Urban Pollution Management				
267	Note 113	Development of an analytical method for blue-green algal toxins (2 vols)	✓	✓	1991	Operational
268	Note 137	Maintenance of slurry tanks	✓	✓	1992	Operational
	Project Record 268/1/SW	The effect of corrosion on metal slurry tanks	✓	✓	1992	Operational
270	Note 362	Impact of forest clearfelling on stream invertebrates	✓	✓	1995	Understanding
	Project Record 270/13/ST	Impact of forest clearfelling on stream invertebrates	✓	✓	1995	Understanding
272	FR 242	Development of dynamic flow/quality model - (MIKE 11) urban pollution impact	✓	✓	1992	Operational
			<i>Available from FWR (01628 891589)</i>			
273	Note 92	Impact of storm sewage sediments on river quality	✓	✓	1992	Policy
	Project Record 273/6/Y	Impact of storm sewage sediments on river quality - Data records	✓	✓	1992	Policy
283	Note 23	Estuarine and coastal water quality classification - Phase 1: Technical aspects	✓	✗	1991	Policy
	Note 26	Estuarine and coastal water quality classification - Phase 2: Financial aspects	✗	✗	1991	Policy
286	Note 253	Lakes: Classification and monitoring - A strategy for the classification of lakes	✓	✓	1994	Policy
	Project Record 286/6/A	Lakes: Classification and monitoring - A strategy for the classification of lakes	✓	✓	1994	Policy
290	Note 119	Pathogenic microorganisms - Water quality in estuaries and coastal waters	✓	✓	1992	Understanding
	Project Record 290/4/SW	Pathogenic microorganisms	✗	✗	1992	Understanding
292	Note 369	PRAIRIE version 6.01 PC Software with manual	✓	✗	1995	Operational
	Note 370	Case Study of NRA Methodology for Managing Risks	✓	✗	1995	Operational
	Note 371	A Guide to Risk Assessment Methodologies	✓	✓	1995	Operational

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295	Note 309	Groundwater Modelling and Modelling Methodology	✓	✓	1995	Operational
	Project Record 295/20/A	Groundwater Modelling and Modelling Methodology - Review	✓	✓	1995	Operational
	Project Record 295/21/A	Appendix 1 - Databases for Groundwater Modelling	✓	✓	1995	Operational
	Project Record 295/22/A	Appendix 2 - Directory of Models	✓	✓	1995	Operational
302	Note 166	Water quality in estuaries and coastal waters - A review of NRA research requirements	✓	✗	1995	Operational
305	Note 346	Nitrification Rates in Rivers and Estuaries	✓	✓	1995	Operational
313	Note 281	Catchment source areas and the ecological effects of wetland liming - Phases 1 & 2	✓	✓	1994	Operational
	Project Record 313/8/W	Catchment source areas and the ecological effects of wetland liming - Phases 1 & 2	✓	✓	1994	Operational
314	Note 406	Acid Waters : Llyn Brianne project	✓	✓	1995	Policy
	Project Record 314/12/W	Acid Waters : Llyn Brianne project	✓	✓	1995	Policy
318	Project Record 318/5/Y	Development of new techniques for the monitoring of ammonia in water - Project definition study	✓	✓	1991	Operational
322	Note 338	Interpretation of River Quality Data (LAPWING)	✓	✗	1995	Operational
323	Project Record 323/3/HO	Dissolved oxygen and ammonia in tidal waters related to SWQOs - Project definition study	✓	✓	1992	Policy
324	Project Record 324/4/S	Predictive invertebrate community models for estuaries and coastal waters - Project definition study	✓	✓	1992	Policy
327	Note 311	Modelling of blue-green algal blooms	✗	✗	1994	Policy
	Project Record 327/5/A	Modelling of algal blooms	✗	✗	1994	Policy
330	Note 242	Distribution of PCDDs and PCDFs in surface freshwater systems	✓	✓	1994	Policy
	Project Record 330/4/A	Distribution of PCDDs and PCDFs in surface freshwater systems	✓	✓	1994	Policy
331	Note 277	Metal contamination of sediments and statutory quality objectives	✓	✓	1994	Policy
332	Note 101	A unified information system to satisfy the NRA's requirements for ecotoxicology information - the specification study	✓	✓	1992	Operational
337	Note 121	Combined distribution method for estuary modelling	✓	✓	1993	Operational
	Project Record 337/5/SW	Combined distribution method for estuaries - Supporting documentation	✓	✓	1993	Operational
	Project Record 337/6/SW	Combined distribution method for estuaries - Program documentation and disk	✓	✓	1993	Operational
339	Note 243	Treatment processes for ferruginous discharges from disused coal workings	✓	✓	1994	Operational
	Project Record 339/11/Y	Treatment processes for ferruginous discharges from disused coal workings - Additional information	✓	✓	1994	Operational
343	Note 158	Development of a biotic index for the assessment of the pollution status of marine benthic communities	✓	✓	1992	Operational
347	Note 32	Review of R&D priorities - Agricultural impacts on water quality	✓	✓	1992	Understanding
350	Note 190	Mike 11 application guide for intermittent discharges	✓	✓	1994	Operational
	Project Record 350/12/NW	Mike 11 application guide	✗	✗	1994	Operational
353	Note 70	Nutrient levels and statutory quality objectives for estuaries and coastal waters	✗	✗	1994	Policy
354	FR/D 0017	Experimental evaluation of effects of low level contaminants on marine benthic communities	✓	✓	1994	Understanding
			Available from FWR (01628 891589)			

Project No.	Output Ref.	Title	Availability		Date	Uptake Route
			Internal	External		
355	Project Record 355/1/HO	CYCLOPS - Automatic formal sampling machine	✗	✗	1993	Operational
359	Note 262	Low rate irrigation of dilute farm wastes	✓	✓	1994	Operational
	Project Record 359/6/ST	Low rate irrigation of dilute farm wastes	✓	✓	1994	Operational
360	Note 102	Constructed wetlands to ameliorate metal-rich minewater - Review of existing literature	✓	✓	1992	Operational
	Note 103	Constructed wetlands to ameliorate metal-rich minewater - Study of natural wetlands	✓	✓	1992	Operational
361	Note 183	Analysis, storage and archiving of water quality data - Options for automatic data validation	✓	✓	1993	Operational
	Project Record 361/4/NW	Analysis, storage and archiving of water quality data - Supporting documentation	✓	✓	1993	Operational
364	Note 276	Is biomanipulation a useful technique in lake management?	✓	✓	1994	Operational
365	Note 280	Heavy metals in UK estuaries	✓	✗	1994	Understanding
368	Note 405	Erosion of forest roads due to natural and man-induced processes	✓	✗	1994	Understanding
	Note 493	Erosion of forest roads due to natural and man induced processes Volume 2 - Experimental results, conclusions and technical recommendations	✓	✓	1995	Understanding
369	Note 198	Statistical analysis of relationships between chemical and biological river quality data	✓	✓	1993	Policy
374	Note 218	Wastewater Disinfection: Laboratory/field studies - Phase 2	✓	✓	1993	Policy
379	Note 246	The use of <i>in situ</i> assays to assess river quality	✓	✓	1993	Operational
	Project Record 379/10/T	The use of <i>in situ</i> assays to assess river quality	✓	✓	1993	Operational
381	Note 181	Pollution potential of contaminated sites - A review	✓	✗	1993	Operational
	Project Record 381/6/T	Pollution potential of contaminated sites - A test methodology and assessment procedure based on leachability	✓	✓	1993	Operational
	Note 301	Leaching tests for the assessment of contaminated land: Interim NRA guidance	✓	✓	1994	Operational
391	Project Record 391/2/N&Y	Waste minimisation - Project Catalyst and the Aire and Calder project (video)	✓	✓	1994	Understanding
	Note 496	Reducing costs and improving environmental performance through waste minimisation (case studies)	✓	✓	1995	Understanding
	Note 497	Demonstration project for industrial waste water minimisation - Aire and Calder (final report)	✓	✓	1995	Understanding
392	Note 219	Sources and fates of synthetic organics in rivers	✓	✓	1993	Understanding
395	Project Record 395/3/A	Chlorophyll <i>a</i> : SCA method revision	✓	✓	1994	Operational
396	Note 323	Sediment toxicity of poorly soluble substances	✓	✓	1995	Understanding
399	Note 111	The estuarine modelling shell ECoS - An evaluation for use by the NRA	✓	✓	1992	Operational
	Note 157	The estuarine modelling shell ECoS	✓	✓	1992	Operational
402	Note 282	Review and assessment of replacements for biochemical oxygen demand (BOD) and suspended solids	✓	✓	1994	Policy
	Project Record 402/11/HO	Review and assessment of replacements for biochemical oxygen demand (BOD) and suspended solids	✓	✓	1994	Policy
408	FR 384	UPM applications methodology - Final report	✓	✓	1993	Operational
			Available from FWR (01628 891589)			

Project No.	Output Ref.	Title	Availability		Date	Uptake Route
			Internal	External		
410	Note 237	Review of pollution emergency arrangements and remedial measures	x	x	1993	Operational
411	Note 188	Correlation between enterovirus and faecal indicator organisms	✓	✓	1993	Understanding
	Project Record 411/3/Y	Correlation between enterovirus and faecal indicator organisms - detailed statistical analysis	✓	✓	1993	Understanding
412	FR 356	Marine and estuarine modelling: Current practice in the UK	✓	✓	1993	Operational
			<i>Available from FWR (01628 891589)</i>			
	FR 374	A framework for marine and estuarine model specification in the UK	✓	✓	1993	Operational
			<i>Available from FWR (01628 891589)</i>			
415	FR 339	UPM applications methodology - Final report	✓	✓	1993	Operational
			<i>Available from FWR (01628 891589)</i>			
420	Note 322	Ecotoxicology methods manual	x	x	1994	Understanding
422	Note 156	A review of the water quality implications of conifer harvesting in the UK - 1. Literature review and recommendations for research	✓	✓	1993	Understanding
	Note 159	A review of the water quality implications of conifer harvesting in the UK - 2. Unpublished results from ITE clearfelling studies	✓	x	1993	Understanding
423	Note 248	Classification options for trophic status	✓	x	1993	Policy
425	Report 16	Control of pollution from highway drainage discharges	✓	✓	1995	Operational
			<i>Available from CIRIA (0171 222 8891)</i>			
427	Note 286	Evaluation of possible replacements for biochemical oxygen demand (BOD <sub>5</sub> ) and suspended solids	✓	✓	1994	Policy
428	Note 363	Automatic exception reporting of trends in water quality	✓	✓	1994	Policy
430	FR/CL 0003	National consent translation project (NCTP)	✓	✓	1995	Understanding
			<i>Available from FWR (01628 891589)</i>			
432	FR0465	Development of a procedure for assessing the impact of combined sewer overflows	✓	✓	1994	Understanding
			<i>Available from FWR (01628 891589)</i>			
	FR0466	User guide for assessing the impact of combined sewer overflows	✓	✓	1994	Understanding
			<i>Available from FWR (01628 891589)</i>			
434	Note 168	Pathogens from farming: Fate and transport in soil - a review	✓	x	1993	Understanding
439	Note 222	Analytical method for the determination of triazine pesticides in sandstone aquifer materials	✓	✓	1993	Operational
	Note 223	Analytical method for the determination of uron and carbamate pesticides in sandstone and chalk aquifer materials	✓	✓	1993	Operational
	Note 231	Multiresidue method for the analysis of twenty pesticides in rainwater, groundwater and riverwater	✓	✓	1993	Operational
	Note 293	Determination of triazine herbicides in chalk aquifer materials	✓	✓	1994	Understanding
	Note 294	Analytical method for the determination of acid herbicides in sandstone and chalk aquifer materials	✓	✓	1994	Operational
	Note 310	Pesticides in major aquifers - Phase 2:Modelling review	✓	✓	1994	Operational
	Project Record 439/16/A	Pesticides in major aquifers: Phase 2	x	x	1994	Operational
	Report 17	Pesticides in major aquifers (ISBN 011 885842 4)	✓	✓	1994	Operational
			<i>Available from HMSO Price £6.95</i>			
449	Project Record 449/1/SW	Modelling <i>E. coli</i> in streams	✓	✓	1994	Understanding
			<i>Limited release via DoE</i>			
450	Note 269	Impacts of pesticides on river ecology	✓	✓	1995	Operational
451	Note 232	Acoustic doppler current profiling	✓	✓	1994	Operational

Project No.	Output Ref.	Title	Availability		Date	Uptake Route
			Internal	External		
453	Note 320	Land management techniques	✓	✓	1994	Understanding
	Project Record 453/7/Y	Land management techniques: detailed information	✓	✓	1994	Understanding
456	Note 226	Protocol for wastewater disinfection trials	✓	✓	1994	Policy
	Note 227	Measurement and calculation of UV dose during sewage disinfection	✓	✓	1994	Policy
	Note 228	Efficacy and environmental effects of peracetic acid as a sewage disinfectant: addendum to Project Record 231/6/SW	✓	✓	1994	Policy
	Note 229	Review of the use of chlorine for sewage disinfection	✓	✓	1994	Policy
	Note 367	Wastewater Disinfection - Laboratory & Field Trails (phase 3)	✓	✓	1995	Policy
457	Note 297	Establishment of practical pH scales and ammonia ionisation in estuaries - Part 2 Validated ammonia model- programme supplement	✓	✗	1993	Operational
	Note 288	Establishment of practical pH scales and ammonia ionisation in estuaries - Part 1 Validated ammonia model	✓	✗	1994	Operational
	Note 429	Estuarine pH measurements	✓	✗	1994	Understanding
463	Note 210	Definition study for the implementation of toxicity - based consents	✗	✗	1993	Understanding
464	FR/CL0002	Urban Pollution Management manual	✓	✓	1995	Operational
			<i>Available from FWR (01628 891589)</i>			
471	Note 245	Development of a quality system for water quality monitoring instrumentation - Outline laboratory quality manual: Calibration and testing	✓	✓	1993	Operational
	Project Record 471/1/ST	Development of a quality system for water quality monitoring instrumentation	✓	✓	1993	Operational
473	Note 314	A review of the use of field test kits for water quality monitoring	✓	✓	1994	Operational
	Project Record 473/7/Y	A review of the use of field test kits for water quality monitoring: Background information	✓	✓	1994	Operational
476	Note 298	Male specific and somatic coliphages as models for enteric viruses	✓	✓	1994	Policy
	Project Record 476/5/SW	Male specific and somatic coliphages as models for enteric viruses	✓	✓	1994	Policy
482	Note 368	Early warning system for potential change in river class	✓	✓	1995	Operational
494	Note 389	Identification of screening lethal and sub-lethal toxicity tests for assessing effluent toxicity	✓	✗	1995	Operational
496	Note 263	Comparison of agar and broth formulations of membrane lauryl sulphate medium	✓	✓	1994	Operational
	Project Record 496/2/SW	Comparison of agar and broth formulations of membrane lauryl sulphate medium	✓	✓	1994	Operational
497	Note 264	Improved tissue culture techniques for enterovirus analysis	✓	✓	1994	Operational
	Project Record 497/2/SW	Improved tissue culture techniques for enterovirus analysis - Details of method development	✓	✓	1994	Operational
504	Note 331	Analytical quality control for macroinvertebrate enumeration	✓	✓	1994	Operational
	Project Record 504/6/S	Biological assessment methods	✓	✗	1994	Operational
507	Note 394	Evaluation of mini metal sensors	✓	✓	1994	Operational
521	Project Record 521/1/HO	Feasibility study for alpha-track analysis of particles	✓	✓	1995	Understanding
555	Project Record 555/6/N&Y	Regulation of real time control of urban drainage systems - Detailed information	✓	✗	1994	Understanding
	Note 399	Regulation of real time control of urban drainage systems	✓	✓	1995	Understanding
565	Project Record 565/1/ST	Septic Tank Systems : The role of the environmental regulator	✓	✓	1994	Understanding

Project No.	Output Ref.	Title	Availability		Date	Uptake Route
			Internal	External		
<b>COMMISSION B: WATER RESOURCES</b>						
9	P-100	Climatic change and its potential effect on UK water resources (Parts 1&2)	✓	✓	1990	Policy
108	Note 109	A comparison of groundwater sampling by pore-water extraction and packer testing	✓	✓	1992	Operational
	Project Record 108/6/Y	A comparison of groundwater sampling by pore-water extraction and packer testing	✓	✓	1992	Operational
110	Note 307	Prediction of Groundwater Nitrate Concentrations	✓	✓	1994	Operational
	Note 308	Prediction of Groundwater Nitrate Concentrations - ANNA user guide	✓	✓	1994	Operational
111	Note 6	National groundwater protection policy - Hydrogeological criteria for division of land surface area	✓	✓	1991	Policy
115/102	Note 56	Hydrological impacts of broadleaf woodlands - Implications for water use and quality	✓	✓	1992	Understanding
	Project Record 115/3/ST	Hydrological impacts of broadleaf woodlands - Implications for water use and quality	✓	✓	1992	Understanding
128	Note 169	Groundwater storage in British aquifers: Chalk	✓	✓	1993	Understanding
	Project Record 128/8/A	Groundwater storage in British aquifers: Chalk (2 vols)	✓	✓	1993	Understanding
207	Note 13	Remote sensing of snow by satellites - Investigation of potential application	✓	✓	1991	Operational
	Note 247	Remote sensing of snow by satellite - Development and evaluation of techniques	✓	✓	1993	Operational
	Project Record 207/10/NY	Remote sensing of snow by satellite	✓	✓	1993	Operational
235	AEA-EE-0109	Survey of drainage practices in landfilled wastes	✓	✓	1990	Understanding
237	Note 45	Method for assessment of low flow conditions caused by abstraction - Procedural manual	✓	✓	1992	Operational
	Project Record 237/2/T	Method for assessment of low flow conditions caused by abstraction (2 vols)	✓	✓	1992	Operational
241	Project Record 241/6/S	Expert systems for water resources management - licencing of groundwater abstractions	✓	✓	1991	Understanding
	Report 3	Expert systems for water resources management - licencing of groundwater abstractions	✓	✓	1991	Understanding
248	Note 128	Economics of water resource management - Potential use of economic instruments	✓	✓	1993	Policy
	Project Record 248/4/A	Economics of water resource management - Potential use of economic instruments	✓	✓	1993	Policy
	Project Record 248/5/A	Economics of water resource management - Proposed charging scheme	✗	✗	1993	Policy
257	Note 274	Low flow estimation in artificially influenced catchments	✓	✓	1994	Operational
	Note 448	Predicting artificially influenced flow statistics using Micro LOW FLOWS v2.0	✓	✓	1995	Operational
277	Note 74	Effect of sea level rise on water resources	✓	✓	1992	Policy
280	Note 31	Review of low velocity measurement techniques - Flow gauging	✓	✓	1991	Operational
	Project Record 280/2/A	Review of low velocity measurement techniques - Flow gauging (2 vols)	✓	✓	1991	Operational
282	Note 185	Ecologically acceptable flows - Assessment of instream flow incremental methodology	✓	✓	1993	Operational
	Project Record 282/1/W	Ecologically acceptable flows - Assessment of instream flow incremental methodology	✓	✓	1993	Operational
284	Note 126	Methodology for monitoring and sampling groundwater	✓	✓	1992	Operational

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			Internal	External		
303	Note 59	Review of hydrometric field techniques used by NRA	✓	✓	1992	Operational
	Project Record 303/4/ST	Review of hydrometric field techniques used in the NRA - Data, procedural detail and supporting documentation	✓	✓	1992	Operational
306	Note 215	Bacterial denitrification in aquifers: Evidence from the unsaturated zone and the unconfined chalk and Sherwood sandstone aquifers	✓	✓	1994	Understanding
	Project Record 306/11/ST	Bacterial denitrification in aquifers: Evidence from the unsaturated zone and the unconfined chalk and Sherwood sandstone aquifers	✓	✓	1994	Understanding
316	Note 270	The Coalburn catchment experiment - 25 year review	✓	✓	1994	Operational
	Project Record 316/3/NW	The Coalburn catchment experiment - 25 year review	✓	✓	1994	Operational
329	Note 50	Review of hydrometric data processing systems in the NRA	✓	✓	1992	Operational
	Project Record 329/4/NW	Review of hydrometric data processing systems in the NRA - Vol 1 - Main text	✓	✓	1992	Operational
	Project Record 329/5/NW	Review of hydrometric data processing systems in the NRA - Vol 2 - Regional reports	✓	✓	1992	Operational
356	Note 35	Water resources planning - Strategic options (2 vols)	✓	✗	1991	Policy
398	Note 114	Water resource management and the protection of wetland functioning - Research and development priorities for the NRA	✓	✓	1992	Operational
401	Note 136	Evaluation of the costs and benefits of low flow alleviation	✓	✓	1992	Policy
	Note 89	Evaluation of the costs and benefits of low flow alleviation - Literature review	✓	✓	1992	Policy
406	Note 491	Intelligent system for water abstraction licence determination	✓	✓	1994	Understanding
	Note 492	Intelligent system for water resources licence determination - User manual	✓	✓	1994	Understanding
	Project Record 406/3/S	Intelligent system for water resources licence determination	✓	✗	1994	Understanding
413	Project Record 413/3/A	Demand for irrigation water - Planning for water abstraction for irrigation	✓	✓	1993	Policy
	Report 14	Demand for irrigation water (ISBN 0 11 885833 5)	✓	✓	1994	Policy
		<i>Available from HMSO Price £9.95</i>				
414	Note 313	Surface water yield assessment	✓	✓	1994	Understanding
	Project Record 414/5/Y	Surface water yield assessment	✓	✗	1994	Understanding
419	Note 184	River bed lining - State of the art review	✓	✓	1993	Operational
421	Project Record 421/1/NW	NRA - BGS Collaboration in groundwater research	✓	✓	1994	Understanding
478	Note 333	Calibration of electromagnetic current meters - Phase 2	✓	✗	1994	Understanding
	Project Record 478/1/T	Calibration of electromagnetic current meters - Phase 2	✓	✗	1994	Understanding
484	Note 258	Evaluation of use values from alleviating low flows	✓	✓	1994	Operational
491	Note 330	Scoping study to develop design tools for low flow estimation	✓	✓	1995	Understanding
515	Project Record 515/2/NY	Extended flow records at key locations in England & Wales - Phase 1	✓	✓	1994	Understanding
541	FR/GF 1	Groundwater in the UK - Issues and Research Needs	✓	✓	1995	Understanding
		<i>Available from FWR (01628 891589)</i>				
	FR/GF 2	Groundwater issues	✓	✓	1995	Understanding
		<i>Available from FWR (01628 891589)</i>				
548	Note 411	Evaluation of flow measurement techniques for low head conditions	✓	✓	1995	Understanding

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			Internal	External		
549	Note 350	Revised SWK Methodology - Assessment of low flows caused by abstraction - Manual	✓	✓	1995	Operational
	Note 351	Revised SWK Methodology - Assessment of low flows caused by abstraction - Report	✓	✓	1995	Operational
<b>COMMISSION C: FLOOD DEFENCE</b>						
31	P-67	Environmental impact assessment of flood protection schemes	✓	✓	1991	Operational
33	Project Record 33/1/ST	Manual for condition assessment of flood defences throughout the NRA - Preliminary study	✓	✓	1991	Operational
200	Note 14	Review of existing practices for fluvial maintenance operations	✗	✗	1991	Operational
201	Project Record 201/2/SW	River flood forecasting - State of the art review	✓	✗	1991	Operational
209	Note 122	Prioritisation and programming of Flood Defence work - Phase 1 report	✓	✗	1991	Operational
213	Project Record 213/1/Y	Review of existing practices for fluvial grass management throughout the NRA	✗	✗	1992	Operational
217	Note 24	Cost-estimation manual for sea defences: Information for preparing construction cost estimates and work appraisals	✓	✓	1991	Operational
	Project Record 217/5/A	Cost-estimation manual for sea defences - Supporting data	✓	✓	1992	Understanding
221	Project Record 221/2/A	Economic appraisal of the consequences of climate - induced sea level rise	✓	✓	1992	Policy
232	Project Record 232/1/T	Sediment and gravel transportation in rivers including the use of gravel traps	✓	✓	1991	Policy
234	Note 27	Lone worker alarm - Feasibility study	✓	✗	1991	Operational
	Project Record 234/4/A	Lone worker alarm - Feasibility study	✗	✗	1991	Understanding
238	Project Record 238/2/T	Sensitivity of sea defence structures to rise in sea level	✓	✓	1991	Understanding
245	Note 7	Techniques for identification of floodplains	✓	✓	1992	Operational
252	Note 44	Design method for straight compound channels	✓	✗	1992	Operational
	Project Record 252/1/T	Development of design method for straight compound channels (2 vols)	✗	✗	1992	Operational
	Project Record 252/2/T	Assessment of flows in meandering compound channels	✗	✗	1993	Operational
	Report 13	Design of straight and meandering compound channels - Interim guidelines on hand calculation methodology	✓	✓	1993	Operational
258	Note 22	Streambank protection in England and Wales - Review of existing practice and guidelines for selection, design and installation	✓	✗	1991	Operational
262	Note 127	Flood Defence levels of service - Final recommendations (7 vols including Annex A to E and summary)	✗	✗	1990	Policy
264	Project Record 254/1/SW	A knowledge-based approach to modelling fast response catchments	✗	✗	1994	Operational
266	Note 116	Revetment systems and materials	✓	✓	1993	Operational
	Project Record 266/3/A	Revetment systems and materials	✓	✓	1993	Operational
269	Note 51	Viability of emergency plant and vehicles	✗	✗	1992	Operational
278	Note 65	NRA emergency communications strategic study - Preliminary findings	✓	✓	1991	Understanding
281	Note 58	Beach development due to climate change	✓	✓	1992	Understanding
288	Project Record 288/1/T	SERC research programme on compound channels	✗	✗	1992	Understanding
289	Note 106	Flood Defence emergency response	✓	✗	1992	Policy
	Project Record 289/2/T	Flood Defence emergency response - National levels of service	✗	✗	1992	Policy

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293	Project Record 293/2/S	Efficiency and effectiveness of planning activities	✓	✓	1992	Policy
298	Note 225	Evaluation of FRONTIERS and local radar rainfall forecasts for use in flood forecasting models	✓	✓	1993	Operational
	Note 387	Evaluation of FRONTIERS and local radar rainfall data for use in flood forecasting models	✓	✓	1995	Operational
299	Note 207	Planning and flood risk: A strategic approach for the National Rivers Authority	✓	✓	1995	Policy
	Project Record 299/1/W	Planning and flood risk: A strategic approach for the NRA	✓	✓	1995	Policy
300	Note 300	Design and operation of trash screens	✓	✓	1994	Policy
	P-126	Design and operation of trash screens - Interim guidance notes <i>Available from NRA Regions free of charge</i>	✓	✓	1993	Policy
	Project Record 300/2/T	Design and operation of trash screens	✓	✓	1992	Policy
301	Note 29	Saltings as a sea defence - Research and development programme	✓	✓	1991	Operational
308	Project Record 308/2/HO	Review of NRA coastal and estuarial R&D related to flood defence	✗	✗	1991	Understanding
309	Note 57	Non-aggregate marine materials for beach recharge - Stage 1 project definition study <i>Available from CIRIA (0171 222 8891)</i>	✓	✓	1992	Understanding
335	Note 134	Review of research and development programme in topic area C3: Catchment appraisal and control	✓	✗	1992	Understanding
341	Note 199	Asset Management Planning for flood defences - Stage 2 (2 vols) <i>Price £80.00</i>	✓	✗	1993	Policy
342	Note 162	Stabilization of soil embankments - Soil nailing	✓	✓	1993	Operational
	Project Record 342/4/A	Stabilization of soil embankments - Soil nailing (Promotional video) <i>Available from Soil Nailing Ltd. (01222 77707)</i>	✓	✓	1993	Operational
	Project Record 342/5/A	Stabilization of soil embankments - Soil nailing	✓	✓	1993	Operational
344	Note 189	Aquatic weed control operations - Phase 1 report: Existing practice	✓	✓	1993	Operational
345	Note 213	Public perception of rivers and flood defence - Flooding and flood defences in York	✓	✗	1993	Policy
	Project Record 345/2/T	Public perception of rivers and flood defence - Flooding and flood defences in York	✓	✗	1993	Policy
357	Note 252	Development of distributed models using radar rainfall data	✓	✓	1994	Understanding
363	Project Record 363/1/NW	Pumping station efficiency - Maintenance practices organisation & energy saving initiatives	✓	✗	1995	Operational
	Project Record 363/2/NW	Pumping station efficiency - Survey of pumping installations & design philosophy	✓	✗	1995	Operational
367	Note 462	Vertically pointing radar	✓	✓	1995	Understanding
373	Note 160	Coastal and river infrastructure management systems for flood defence - User manual <i>Price £60.00</i>	✓	✗	1993	Operational
	Project Record 373/2/T	Coastal and river infrastructure management systems for flood defence	✓	✗	1993	Operational
	Report 7	Improving efficiency and effectiveness in Flood Defence operational management <i>Available from NRA Regions free of charge</i> - Review of R&D (1990-1993)	✓	✓	1993	Operational
382	Project Record 382/3/A	Armourstone foundations - Phase 1	✓	✓	1993	Operational
386	Project Record 386/4/A	Rehabilitation of coastal structures	✗	✗	1993	Operational

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			Internal	External		
431	Project Record 431/3/A	Emergency sealing of breaches - Phase 1	✓	✗	1993	Operational
	Note 376	Emergency sealing of breaches - Phase 2	✓	✓	1995	Operational
	Project Record 431/4/A	Emergency sealing of breaches - Phase 2	✓	✗	1995	Operational
433	Note 396	Dissemination of Anglian Sea Defence Management Study	✓	✓	1995	Operational
435	Note 187	Economic appraisal of non-grant aided work - User guidelines	✗	✗	1993	Operational
	Project Record 435/2/NW	Economic appraisal of non-grant aided work - User guidelines: Background information	✗	✗	1993	Operational
437	Note 197	Methodology for collating tidal water level data	✓	✓	1993	Operational
441	Project Record 441/3/A	Suggested guidelines for the monitoring of natural and recharged beaches	✓	✓	1994	Operational
444	Note 324	A guide to the understanding and management of saltmarshes	✓	✓	1994	Operational
445	Note 272	Application of appropriate wave transformation models - Guidance on evaluating and selecting a model for design and use	✓	✓	1994	Operational
	Project Record 445/2/A	Application of appropriate wave transformation models - Guidance on evaluating and selecting a model for design and use	✓	✗	1994	Operational
447	Note 283	Effectiveness of beach control operations - Review of beach management methods	✓	✓	1994	Operational
	Project Record 447/2/A	Effectiveness of beach control operations - Review of beach management methods	✗	✗	1994	Operational
481	Project Record 481/3/A	Rehabilitation of coastal structures - Design guidelines	✓	✓	1994	Operational
512	Project Record 512/1/HO	An Evaluation of the Aquatic Weeds Research Unit	✗	✗	1995	Understanding
RP404	Report 10	Scope for control of urban runoff Volume 1: Overview Volume 2: Review of present methods and practice Volume 3: Guidelines Volume 4: Review of legislation, procedures, economic and planning issues	✓	✓	1992	Operational

*Available from CIRIA (0171 222 8891)*

### COMMISSION D: FISHERIES

25	P-72	Effects of water quality on freshwater fish populations	✓	✓	1990	Policy
26	P 24	Fish stock management the UK - A review	✓	✓	1990	Policy
123	Note 40	Strategic ecosystem studies of slow-flowing lowland rivers - Water quality, habitats and invertebrate communities of the Great Ouse	✓	✓	1992	Understanding
	Project Record 123/1/A	Strategic ecosystem studies of slow-flowing lowland rivers - Water quality, habitats and invertebrate communities of the Great Ouse	✓	✓	1991	Understanding
124	Note 41	Turbidity and plant growth in large, slow-flowing rivers - Studies of plankton and macrophytes in the Great Ouse	✓	✓	1991	Understanding
	Project Record 124/1/A	Turbidity and plant growth in large, slow-flowing rivers - Studies of plankton and macrophytes in the Great Ouse	✓	✓	1991	Understanding
211	Note 53	Grass carp for aquatic weed control	✓	✓	1992	Operational
229	Note 383	Fish health indices as a marker of surface water quality	✓	✗	1995	Understanding
244	Note 206	The NRA national fisheries classification scheme - A guide for users	✓	✓	1994	Policy
	Project Record 244/7/Y	Development of a fisheries classification scheme	✓	✓	1994	Policy

Project No.	Output Ref.	Title	Availability		Date	Uptake Route
			Internal	External		
249	Report 18	Status of rare fish (ISBN 0 11 886511 0)	✓	✓	1994	Operational
			<i>Available from HMSO Price £8.00</i>			
250	Note 196	Hydroacoustic methods of fish surveys	✓	✓	1993	Operational
	Note 329	Hydroacoustic methods of fish surveys - a field manual	✓	✓	1995	Operational
	Note 374	Acoustic size versus real size relationships for common species of fish	✓	✓	1995	Operational
	Project Record 250/1/T	Hydroacoustic methods of fish surveys (2 vols) - Details of method development	✓	✗	1993	Operational
			<i>Price £60.00</i>			
256	Project Record 256/13/ST	Elver and eel stock assessment in the Severn and Avon	✓	✓	1994	Operational
296	Note 33	Description of NRA tracking studies - Techniques and fish counter technology	✓	✓	1992	Understanding
	Note 34	Evaluation of NRA tracking studies - future projects and technical development	✗	✗	1992	Operational
307	Report 1	Diversion and entrapment of fish at water intakes and outfalls (ISBN 0 11 885826 2)	✓	✓	1992	Operational
			<i>Available from HMSO Price £17.00</i>			
312	Note 349	Estuarine migratory behaviour of salmon and sea trout smolts in the River Conwy	✓	✓	1995	Understanding
325	Note 292	Guidance notes on the design and analysis of river fishery surveys	✓	✓	1994	Operational
326	Note 105	Restoration of riverine fisheries habitats	✓	✓	1992	Operational
	Project Record 326/5/A	Restoration of riverine fisheries habitats	✓	✓	1993	Operational
334	Note 303	Electric fishing in deep rivers	✓	✓	1995	Operational
	Note 304	Electric fishing in deep rivers	✓	✓	1995	Operational
338	Note 400	Use of HABSCORE V software	✓	✓	1995	Operational
	Note 401	A field guide to the completion of HABSCORE forms	✓	✓	1995	Operational
	Project Record 338/20/W	Development of HABSCORE models	✓	✓	1995	Operational
377	Note 195	Fish kills	✓	✗	1993	Operational
397	Note 193	Body burdens in fish: Basis for monitoring	✓	✗	1993	Understanding
	Project Record 397/10/ST	Body burdens in fish: Basis for monitoring - Additional information	✗	✗	1993	Understanding
438	Note 202	Genetic aspects of spring run salmon	✓	✓	1995	Understanding
440	Note 364	Survival and Dispersal of Stocked Coarse Fish	✓	✓	1995	Understanding
	Project Record 440/8/N&Y	Survival and Dispersal of Stocked Coarse Fish - Questionnaire returns	✓	✓	1995	Understanding
443	Note 318	Sea trout investigations - Phase 1 Final Report	✓	✓	1994	Understanding
	Report 25	Sea trout stocks in England and Wales	✓	✓	1995	Understanding
503	Project Record 503/3/W	Fish Tracking Technology Developments: Phase 1	✓	✗	1995	Understanding
559	Note 418	Sea Trout investigations (2) Design of a stock description sampling programme	✓	✗	1995	Understanding

### COMMISSION E: RECREATION AND NAVIGATION

225	Project Record 225/1/T	Bank erosion on navigable waterways	✓	✓	1991	Operational
276	Note 117	Water related recreation: Participation, trends and issues - A socio-economic study to prioritise activities	✓	✓	1994	Policy
336	Note 204	River bank erosion problems - recommendations for their management within the NRA	✓	✗	1995	Operational
	Project Record 336/2/T	River bank erosion problems and solutions (4 vols)	✓	✗	1995	Operational
			<i>Price £60.00</i>			
385	Note 251	Recreational survey methodology	✓	✗	1993	Operational
498	Note 408	Impact of recreation on wildlife	✓	✓	1995	Understanding

Project No.	Output Ref.	Title	Availability		Date	Uptake Route
			Internal	External		
501	FTR 5	National angling survey 1994 (ISBN 0 11 885841 6)	✓	✓	1995	Operational
	Note 385	Socio-economic review of angling 1994	✓	✓	1995	Operational
	Note 295	Socio-economic review of angling - Rod licences	✓	✗	1995	Operational
593	Note 396	Private Boating - Price Demand Relationship	✗	✗	1995	Policy
<b>COMMISSION F: CONSERVATION</b>						
27	P-38	River corridor surveys in relation to nature conservation activities of the NRA	✓	✓	1990	Operational
28	Project Record 28/1/N	Database of aquatic plants in the British Isles - Phase 1 submerged and floating plants	✓	✓	1991	Operational
29	P-103	Nature conservation in urban watercourses - present practices and policies	✓	✓	1990	Operational
214	Note 52	Environmental assessment of NRA projects	✓	✓	1992	Operational
255	Note 2	Environmental opportunities in low-lying coastal areas under a scenario of climate change	✓	✓	1993	Policy
	Project Record 255/3/T	Environmental opportunities in low lying coastal areas under a scenario of climate change	✓	✓	1993	Policy
274	Project Record 274/3/ST	River landscape assessment methodology	✓	✓	1992	Operational
291	Note 135	Riparian and instream species - Habitat relationships	✓	✓	1993	Operational
	Project Record 291/4/W	Riparian and instream species - Habitat relationships	✓	✓	1992	Operational
294	Note 233	Control of invasive riparian and aquatic weeds	✓	✓	1995	Operational
	Project Record 294/7/W	Control of invasive riparian and aquatic weeds	✓	✓	1995	Operational
340	Note 87	Buffer zones for conservation of rivers and bankside habitats	✓	✓	1992	Operational
	Project Record 340/5/Y	Buffer zones for conservation of rivers and bankside habitats	✓	✓	1992	Operational
387	Note 154	Draft guidelines for the design and restoration of flood alleviation schemes	✓	✓	1993	Operational
	Note 155	River engineering works in gravel-bed river - Summary of results, conclusions and recommendations	✓	✓	1993	Operational
	Project Record 387/1/W	River engineering works in gravel-bed rivers - Phase 1	✓	✓	1993	Operational
393	Note 107	Review of nature conservation survey methodologies	✓	✓	1993	Operational
	Note 186	Review of nature conservation survey methodologies: Conservation database and operating manual	✓	✗	1993	Operational
	Project Record 393/5/SW	Review of nature conservation survey methodologies	✓	✓	1993	Operational
418	Note 212	Impact assessment and acceptable conservation criteria: Area A: Conservation criteria and river flow parameters - Phase 1	✓	✓	1993	Operational
	Project Record 418/3/A	Impact assessment and acceptable conservation criteria: Area A: Conservation criteria and river flow parameters - Phase 1	✓	✓	1993	Operational
461	Note 267	Avian piscivores: Basis for policy	✓	✓	1995	Policy
	Note 285	Species Management in Aquatic Habitats: Phase I - Development of priority lists of rare and nuisance species	✓	✓	1995	Policy
	Project Record 461/8/NY	Avian piscivores: Basis for policy - Detailed information	✓	✓	1994	Policy
	Project Record 461/9/NY	Species Management in Aquatic Habitats	✓	✗	1995	Policy
	Report 15	Fish-eating birds - Assessing their impact on freshwater fisheries	✓	✓	1994	Policy

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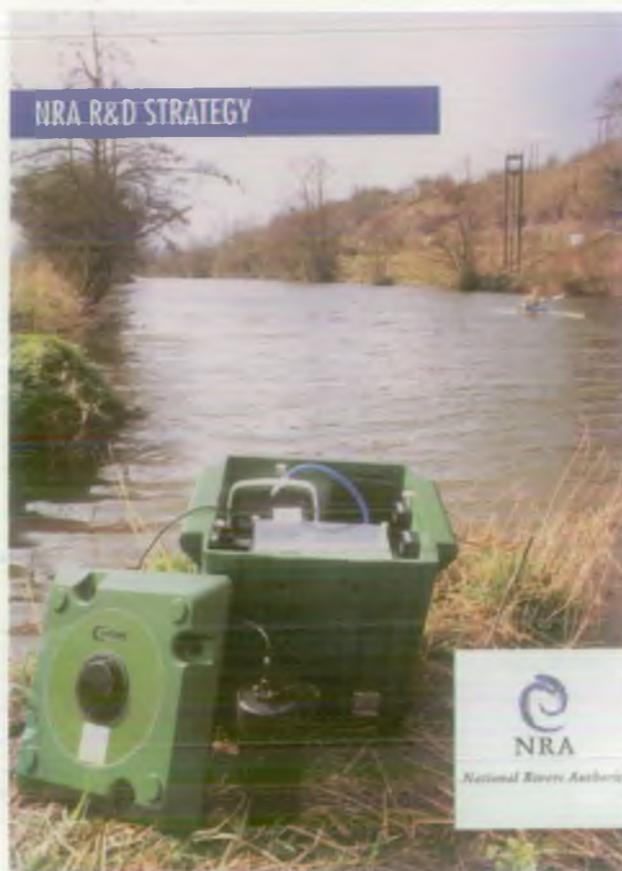
Project No.	Output Ref.	Title	Availability		Date	Uptake Route
			Internal	External		
466	Note 265	River restoration project - institutional aspects	✓	✓	1994	Operational
472	Note 375	Legal scoping report for coastal conservation	✓	✓	1995	Policy
474	Note 377	Wetland resource evaluation and the NRA role in its Conservation 1	✓	✓	1995	Policy
	Note 378	Wetland resource evaluation and the NRA role in its Conservation 2	✓	✓	1995	Policy
506	Note 289	The NRA and archaeology: Impact of activities	✓	✓	1994	Operational
	Project Record 506/1/W	The NRA and archaeology: Impact of activities - Detailed information	✓	✓	1994	Operational
554	Note 365	The NRA and archaeology - Phase 2	✓	✓	1995	Operational

### COMMISSION G: CROSS-FUNCTIONAL

6	P-9	Review of catchment water quality models	✓	✓	1989	Understanding
8	Note 469	Catchment Modelling - A review	✓	✓	1995	Understanding
56	P-40	Application of catchment management plans in Europe - A brief review	✓	✓	1990	Understanding
253	Note 37	Economic value of changes to the water environment	✓	✓	1992	Policy
	Report 6	Development of environmental economics for the NRA (ISBN 0 11 885828 9)	✓	✓	1993	Policy
		<i>Available from HMSO Price £15.00</i>				
310	Note 16	New style charging schemes for discharges and abstractions	✗	✗	1991	Policy
311	Note 28	Review of remote sensing - potential role within the NRA	✓	✓	1992	Operational
		<i>Price £60.00</i>				
	Project Record 311/2/HO	Review of remote sensing - potential role within the NRA	✓	✓	1992	Operational
321	Note 174	Sources, pathways and sinks of litter within riverine and marine environments	✓	✓	1993	Operational
	Project Record 321/8/W	Sources, pathways and sinks of litter within riverine and marine environments	✓	✓	1994	Operational
328	Report 4 (ISBN 0 11 885827 0)	Airborne remote sensing of coastal waters	✓	✓	1993	Operational
		<i>Available from HMSO Price £40.00</i>				
351	Note 75	Environmental Assessments undertaken by external developers - Outline recommendations for policy, procedures and training	✗	✗	1992	Policy
	Note 76	Environmental Assessments undertaken by external developers - An interim handbook for staff	✗	✗	1992	Policy
	Project Record 351/7/T	Environmental Assessments undertaken by external developers	✗	✗	1992	Policy
358	Report 12	The implications of climate change for the National Rivers Authority (ISBN 0 11 886517 X)	✓	✓	1994	Policy
		<i>Available from HMSO Price £15.00</i>				
376	Note 73	Evaluation of opportunities for the use of expert systems in the NRA	✓	✓	1992	Understanding
	Note 81	How to identify expert systems applications	✓	✓	1992	Operational
405	Note 161	Catchment managements issues: Use related standards - Project definition study	✓	✓	1993	Operational
	Project Record 405/2/S	Catchment managements issues: Use related standards	✓	✓	1994	Operational
483	Report 21	EUROWATER: Institutional Mechanisms for Water Management in Europe (ISBN 1 873160 28 3)	✓	✓	1995	Understanding
		<i>Available from FWR (01628 891589)</i>				
	Note 422	EUROWATER: Institutional mechanisms for water management in the context of European Environmental Policies	✓	✓	1995	Understanding

Project No.	Output Ref.	Title	Availability		Date	Uptake Route
			Internal	External		
492	Note 319	Public perception of the NRA - Development of a methodology	x	x	1995	Operational
	Project Record 492/1/T	Public Perception of the NRA - Qualitative customer research	x	x	1995	Operational
	Project Record 492/3/T	Public Perception of the NRA - Staff Attitude	x	x	1995	Operational
538	Note 327	Feasibility study on deployment of expert systems for FM/SOD & Project Management	✓	✓	1995	Understanding
<b>TECHNICAL SERVICES OUTPUTS</b>						
56	NR 2561	Application of catchment management plans in Europe - a brief review	✓	✓	1990	Operational
	P-84	Guide to sources of information on European Community R&D Programmes and funding	✓	✓	1991	Understanding
	P-85	EC Third framework programme for community research and technological development (1990-1994)	✓	✓	1991	Understanding
86	Project Record 86/22/HO	The comparative resistance of pathogens and indicator organisms to UV disinfection	✓	✓	1994	Understanding
TS		Technical service for information and enquiry support				
		Summary report on environmental developments - Vols 1-22: Legislation and European practice				Understanding
	P-125	1 - October 1988	✓	✓	1994	
	P-126	2 - November 1988 to May 1989	✓	✓	1994	
	P-29	3 - June 1989 to March 1990	✓	✓	1995	
	P-77	4 - April to September 1990	✓	✓	1994	
	P-109	5 - October to December 1990	✓	✓	1994	
	P-111	5A - January to March 1991	✓	✓	1995	
	Note 17	6 - April to June 1991	✓	✓	1995	
	Note 25	7 - July to September 1991	✓	✓	1994	
	Note 38	8 - October to December 1991	✓	✓	1994	
	Note 60	9 - January to March 1992	✓	✓	1995	
	Note 90	10 - April to June 1992	✓	✓	1995	
	Note 115	11 - July to September 1992	✓	✓	1995	
	Note 153	12 - October to December 1992	✓	✓	1994	
	Note 182	13 - January to March 1993	✓	✓	1994	
	Note 205	14 - April to June 1993	✓	✓	1995	
	Note 238	15 - July to September 1993	✓	✓	1994	
	Note 256	16 - October to December 1993	✓	✓	1995	
	Note 290	17 - January to March 1994	✓	✓	1995	
	Note 316	18 - April to June 1994	✓	✓	1994	
	Note 343	19 - July to September 1994	✓	✓	1994	
	Note 360	20 - October to December 1994	✓	✓	1995	
	Note 388	21 - January to March 1995	✓	✓	1995	
	Note 430	22 - April to June 1995	✓	✓	1995	
TS	Report 8	Septic tanks and small sewage treatment works - A guide to current practice and common problems	✓	✓	1994	Operational
			<i>Available from CIRIA (0171 222 8891)</i>			
TS	Note 78	Review of advances in wastewater treatment: Part 1 - Commonly used processes for solids separation, biological treatment and chemical phosphorus removal	✓	✓	1994	Operational
	Note 79	Review of advances in wastewater treatment: Part 2 - Process variants for biological nutrient removal, disinfection and tertiary solids removal	✓	✓	1995	Operational
	Note 80	Review of advances in wastewater treatment: Part 3 - Process variants for secondary treatment and chemical phosphorus removal	✓	✓	1994	Operational
	Note 164	Review of advances in wastewater treatment: Part 4 - Process variants for nutrient removal and physical/chemical treatment of ammonia	✓	✓	1995	Operational
	Note 194	Review of advances in wastewater treatment: Part 5 - Package plant variants for small works	✓	✓	1994	Operational

Project No.	Output Ref.	Title	Availability		Date	Uptake Route
			Internal	External		
<b>R&amp;D FELLOWSHIP OUTPUTS</b>						
	Note 268	Modelling the relative impact of weather, landuse and groundwater abstraction on low flows	✓	✓	1994	Understanding
	Note 278	Survey methodology for algae and other phototrophs in small rivers	✓	✓	1994	Understanding
	Note 366	Plants for monitoring rivers A report of a workshop held at the University of Durham 26-27 September 1994	✓	✓	1995	Understanding
	Note 431	Use of diatoms to monitor nutrients in rivers	✓	✓	1995	Understanding
	Note 279	The sustainable management of the water cycle: Economics and policy	✓	✓	1994	Understanding
	Note 271	Methodologies for optimising the value of river corridor survey data	✓	✓	1994	Understanding
	Note 273	A context for developing methodologies for optimising the value of river corridor survey data	✓	✓	1994	Understanding
	Project Record F3/1/Wx	Methodologies for optimising the value of river corridor survey data - Supporting data	✓	✓	1994	Understanding



The R&D Strategy sets out the main issues that will be addressed through the NRA's R&D Programme. It identifies where, in relation to other government-funded and water industry R&D, the NRA's Programme lies, and serves as a focus for future collaboration. This document is available from NRA Regions free of charge.

## Further Information

This section provides a key to the terminology used in the tables above.

Project No.	NRA reference number by which the project, from which the output has been produced, is known.
Output Ref.	The output reference number. This should be quoted when requesting documents.  In general, R&D Project Records provide background information deemed unnecessary for the uptake of results, and should only be read after the associated R&D Report or R&D Note which puts the details in context. It is recommended that R&D Project Records should only be purchased if it is evident that more detail is required than is provided in the associated documents.
Title	The title by which the output is recognised.
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Uptake Route	Indicates the way in which the output is, or is likely to be, taken up within the NRA. <ul style="list-style-type: none"><li>● Operational      The output provides an operational technique, equipment or guidance which assists NRA staff in their day-to-day duties.</li><li>● Understanding    The output gives NRA staff understanding of a particular problem or issue to support decision making in that field.</li><li>● Policy            The output feeds into the development of NRA policy or the implementation of existing policy statements.</li></ul>
Date	The year in which the document was first published/printed.
Annual R&D Review	Further details of some of the above outputs together with the NRA's R&D Programme are provided in the Annual R&D Review - 1995 (ISBN 0 11 310105 8). Copies may be obtained from HMSO at a price of £50.00

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