

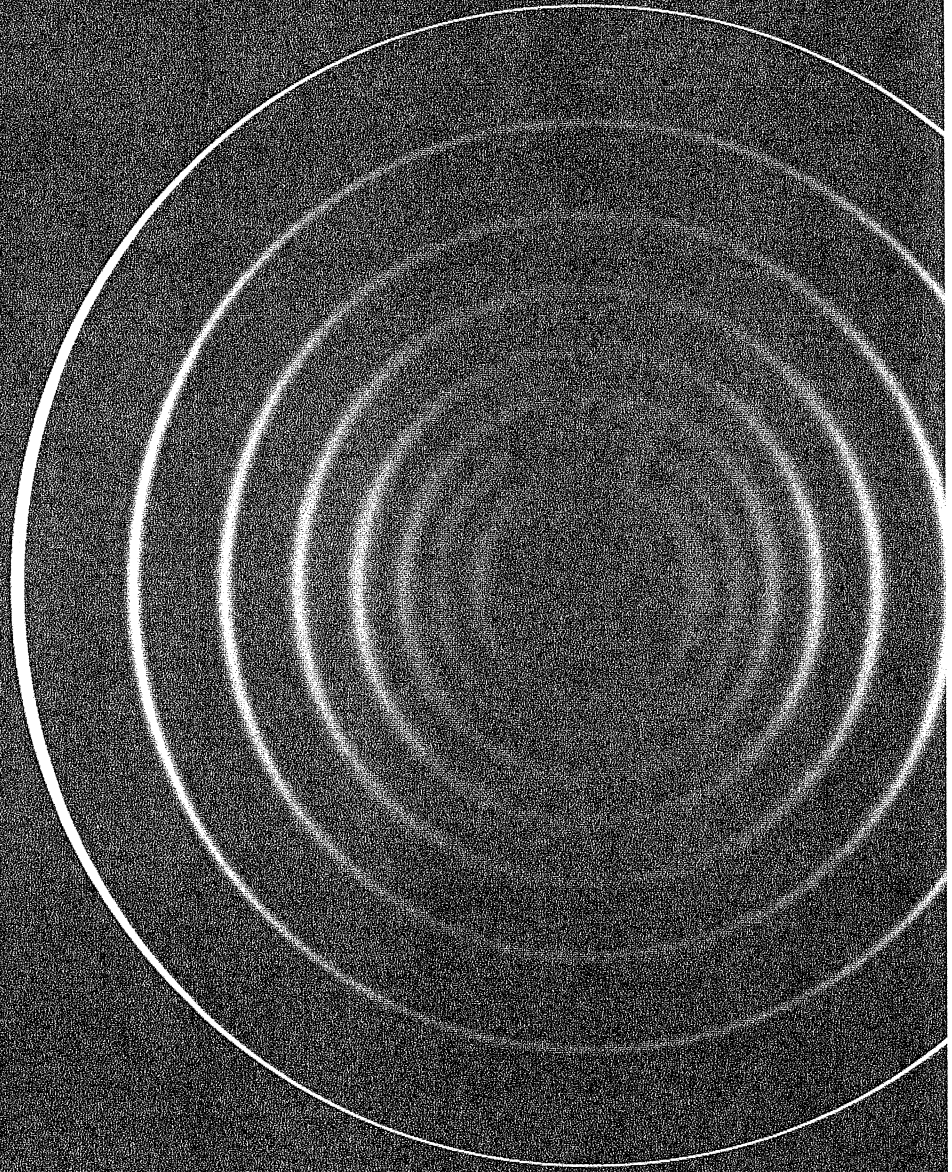
6.10 main assets 1998/99

	Sources reservoirs impounding	boreholes	river abstractions	service/ water towers	Water treatment works	Sewage treatment works preliminary	primary	secondary	tertiary	Total	Underground assets main-km	sewers-km	Pumping stations sewage	water	Storm overflows	Outfalls Long	Short	Total sea & estuarial
TOTAL UK	666	1,584	602	6,919	2,252	n/a	n/a	n/a	n/a	9,260	397,401	354,066	20,719	5,628	16,704	n/a	n/a	1,099
Water service cos																		
Anglian	1	150	12	409	163	11	24	732	308	1,075	34,865	36,727	4,188	275	1,045	9	0	9
Dwr Cymru	84	69	74	745	116	70	201	518	127	916	26,628	17,377	1,624	668	1,743	11	59	70
Northumbrian	13	40	5	268	58	4	90	289	12	395	16,550	15,114	573	242	1,592	22	4	26
North West	112	134	59	493	147	34	145	422	48	649	40,602	39,668	1,570	568	1,972	3	31	34
Severn Trent	4	153	13	568	168	0	17	648	339	1,004	41,960	52,885	2,688	930	1,944	0	0	0
Southern	4	116	12	234	104	24	20	185	164	393	13,263	20,729	1,975	108	1,001	13	11	24
South West	15	18	31	369	40	62	52	345	193	652	14,839	8,536	639	156	852	12	50	62
Thames	0	109	14	258	96	0	0	243	111	354	31,580	77,753	2,432	194	447	0	0	0
Wessex	13	120	5	387	128	9	18	247	91	365	11,104	15,257	1,314	219	976	7	8	15
Yorkshire	105	99	10	440	116	0	87	431	94	612	29,786	29,617	1,466	508	1,652	7	15	22
Total water service cos	351	1,008	235	4,171	1,136	214	654	4,060	1,487	6,415	261,177	313,663	18,469	3,868	13,224	84	178	262
Water supply cos																		
Bournemouth & Hants	0	10	3	25	7	-	-	-	-	-	2,754	-	-	24	-	-	-	-
Bristol	4	16	1	143	23	-	-	-	-	-	6,550	-	-	104	-	-	-	-
Cambridge	0	26	0	34	24	-	-	-	-	-	2,173	-	-	14	-	-	-	-
Cholderton	n/a	n/a	n/a	n/a	n/a	-	-	-	-	-	n/a	-	-	n/a	-	-	-	-
Dee Valley	6	4	5	43	8	-	-	-	-	-	1,971	-	-	44	-	-	-	-
Essex & Suffolk	2	28	9	94	30	-	-	-	-	-	8,406	-	-	93	-	-	-	-
Folkestone & Dover	0	26	0	18	20	-	-	-	-	-	1,044	-	-	11	-	-	-	-
Hartlepool	2	11	-	-	2	-	-	-	-	-	517	-	-	4	-	-	-	-
Mid Kent	1	53	0	63	27	-	-	-	-	-	4,167	-	-	51	-	-	-	-
North Surrey	0	2	3	24	5	-	-	-	-	-	2,490	-	-	28	-	-	-	-
Portsmouth	0	20	1	39	2	-	-	-	-	-	3,229	-	-	34	-	-	-	-
South East	5	68	8	175	256	-	-	-	-	-	9,815	-	-	270	-	-	-	-
South Staffordshire	1	26	2	35	28	-	-	-	-	-	5,722	-	-	46	-	-	-	-
Sutton and East Surrey	1	37	2	39	11	-	-	-	-	-	3,369	-	-	74	-	-	-	-
Tendring Hundred	0	9	1	-	2	-	-	-	-	-	911	-	-	6	-	-	-	-
Three Valleys	0	87	5	53	92	-	-	-	-	-	11,268	-	-	165	-	-	-	-
York	0	0	1	6	1	-	-	-	-	-	980	-	-	-	-	-	-	-
Total water supply cos	22	423	41	791	538	-	-	-	-	-	65,366	-	-	968	-	-	-	-
Total England & Wales	373	1,431	276	4,962	1,674	214	654	4,060	1,487	6,415	326,543	313,663	18,469	4,836	13,224	84	178	262
East Scotland	56	12	36	262	72	n/a	n/a	n/a	n/a	303	12,233	9,474	423	101	612	7	39	46
North Scotland	74	75**	149	842	291	677*	24	316	22	1,039	18,233	7,422	666	252	310	21	540	561
West Scotland	115	12	137	363	137	417*	13	136	19	585	18,219	13,300	401	169	1,305	5	121	126
Total Scotland	245	99	322	1,467	500	n/a	n/a	n/a	n/a	1,927	48,685	30,196	1,490	522	2,227	33	700	733
Northern Ireland	48	54	4	490	78	313	166	190	249	918	22,173	10,207	760	270	1,253	n/a	n/a	104

n/a = not available
 * includes septic tanks
 ** 12 boreholes and 63 springs

Source: Water companies

staffing



7.1 staffing

Full time equivalent employees at March 31

	1993	1994	1995	1996	1997	1998	1999
Total UK	54,908	53,742	52,610	49,359	46,031	45,358	44,224
Water service companies							
Anglian	3,970	3,942	4,815	4,281	4,204	4,103	4,118
Dŵr Cymru	3,437	3,352	3,329	3,172	2,350	2,026	1,775
Northumbrian	1,317	1,370	1,377	1,850	1,672	1,809	1,698
North West	5,571	5,571	5,471	4,697	3,866	4,107	4,216
Severn Trent	7,196	6,757	6,324	5,862	5,653	5,320	5,228
Southern	2,428	2,453	2,371	2,243	1,961	2,371	2,279
South West	2,144	2,141	2,084	1,815	1,755	1,731	1,693
Thames	7,216	6,772	6,485	6,119	5,562	5,449	5,408
Wessex	1,871	1,771	1,582	1,431	1,396	1,312	1,403
Yorkshire	3,813	3,930	3,373	3,091	3,109	3,082	2,678
Total water service cos	38,963	38,059	37,211	34,561	31,528	31,310	30,496
Water supply companies							
Bournemouth & Hants	252	248	235	222	232	243	250
Bristol	575	563	495	474	483	486	584
Cambridge	179	174	169	169	155	174	181
Chester	64	66	65	69	63	-	-
Cholderton	3	3	3	3	3	3	3
Dee Valley ¹	-	-	-	-	-	127	123
East Surrey	211	213	211	-	-	-	-
Essex & Suffolk	751	776	769	730	702	742	735
Folkestone & Dover	121	120	118	111	107	100	95
Hartlepool	68	68	67	63	61	59	53
Mid Kent	441	350	357	476	440	326	329
Mid Southern	318	302	283	280	283	-	-
North East ²	728	701	676	-	-	-	-
North Surrey	177	173	173	176	191	189	180
Portsmouth	325	316	304	289	281	270	270
South East	460	407	380	356	347	625	572
South Staffordshire	703	657	650	597	603	605	593
Sutton	155	159	153	-	-	-	-
Sutton and East Surrey ³	-	-	-	333	278	278	268
Tendring Hundred	103	97	91	86	88	94	93
Three Valleys	961	953	929	869	853	986	900
Wrexham	116	115	107	94	98	-	-
York	93	94	93	89	85	72	75
Total water supply cos	6,804	6,555	6,328	5,486	5,353	5,379	5,304
Scotland:	6,608	6,665	6,653	7,004	6,890	6,463	6,179
North of Scotland	-	-	-	1,940	1,947	1,883	1,767
East of Scotland	-	-	-	2,096	2,055	1,895	1,770
West of Scotland	-	-	-	2,968	2,888	2,685	2,642
Northern Ireland	2,533	2,463	2,418	2,308	2,260	2,206	2,245

¹Dee Valley Water was formed by the merger of Chester and Wrexham in 1998

²North East Water became part of Northumbrian Water in 1996

³Sutton and East Surrey water companies merged in 1996

n/a = not available

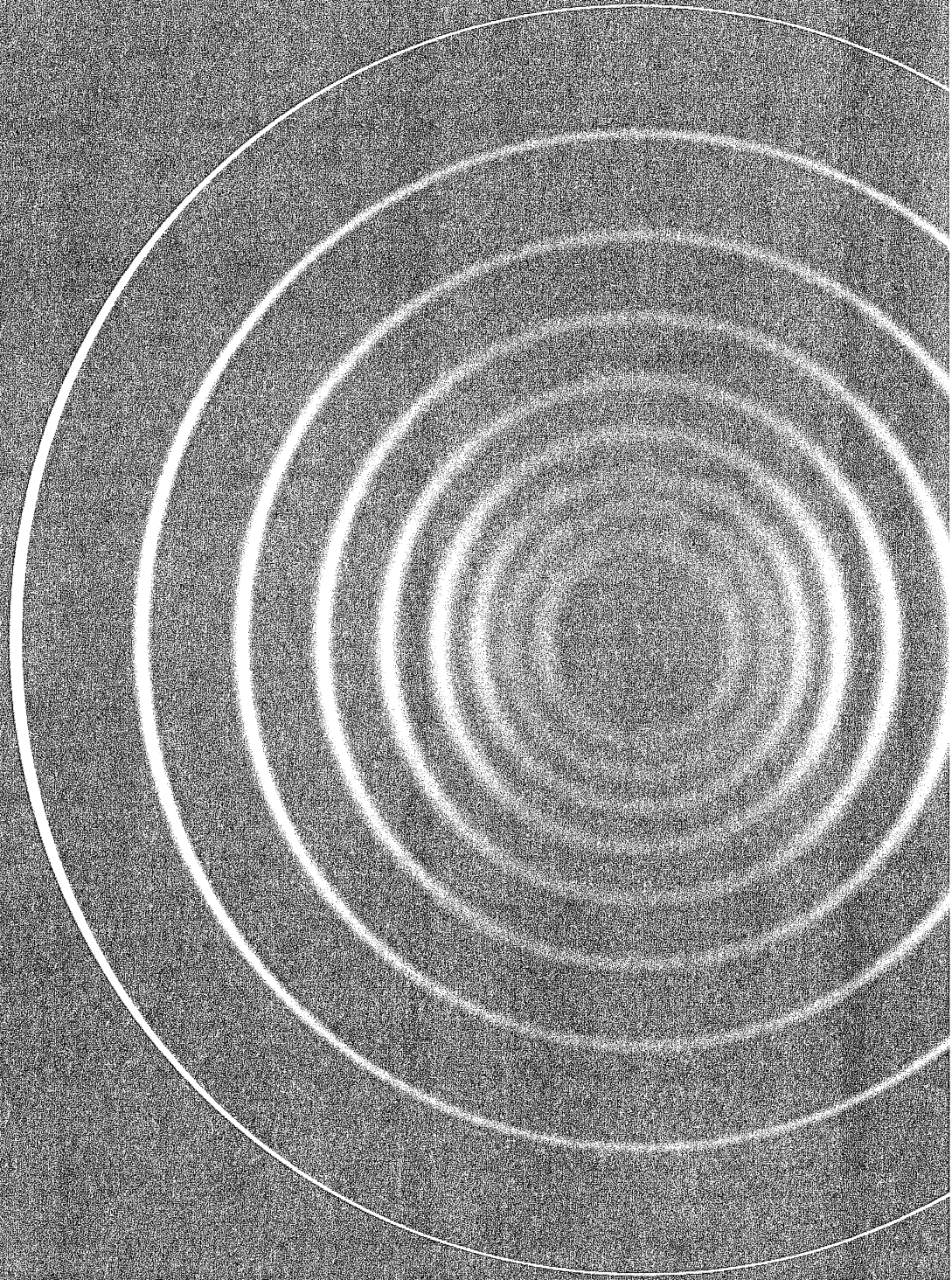
Staffing levels in the industry fell again in 1999 by more than 1,100 to a total of 44,224. It brings the total reduction in staffing levels (measured in full time equivalents) to more than 8,300 over the previous four years. Much of the change has occurred within the private sector companies in England and Wales where staff numbers have fallen by nearly 18 % over the period 1995-99.

A major factor in the reduction is the greater use of outsourcing: putting work once handled in-house out to contractors to improve efficiency. In the case of multi-utility companies, this has included the transfer of staff to new facilities management companies set up to undertake support functions.

But outsourcing has not only affected traditional areas such as property management and information technology. It now includes activities such as accounting services and call centre management.

Over the same period four year period (1995-99), Northern Ireland Water Service staff numbers fell over 7%, from 2,418 to 2245, while the Scottish water sector reported a similar 7% fall.

international



The International Water Association (IWA) is a new organisation resulting from the coming together of two well-established international organisations. It is a non-profit membership organisation. Its mission is to promote best practice and exchange of latest skills, techniques and knowledge of all aspects of water management; to disseminate this worldwide by all possible means including meetings, publications, expert networks and electronic media; to engage in advocacy and exchange of ideas with major agencies, promote public awareness and to provide a means whereby all the different types of organisations and professions in the water sector can exchange information.

Between them, the International Water Services Association (IWSA) and the International Association on Water Quality (IAWQ) have over 80 years' experience. Among their members are the leaders of the water and waste water sectors in all countries of the world, as well as many who are recognised international authorities. The IWA has over 9,000 members.

The Statistics and Economics Committee of the IWSA published a statistical leaflet for the world Congress in Buenos Aires in 1999. Extracts from tables from this leaflet appear in Tables 8.1 – 8.4.

8.1 abstractions for water according to source (million m³)

	True ground water		Spring water		Surface water		Total water abstraction	
	1980	1997	1980	1997	1980	1997	1980	1997
Austria	287	322	320	325	5	5	612	652
Belgium	435	468	0	0	217	270	652	738
Denmark	362	455	0	0	3	2	365	457
Finland	-	240	-	0	-	176	-	416
France	-	3360	-	0	-	2290	-	5650
Germany ¹	4180	3648	570	408	1890	1568	6640	5624
Hungary	297	342	60	290	443	26	800	658
Italy	3290	3975	2535	2385	892	1590	6717	7950
Luxembourg	2	2	27	29	16	16	45	47
Netherlands	667	794	0	0	337	475	1004	1269
Spain	684	1000	0	124	2426	4848	3110	5972
Sweden	239	221	0	0	716	702	955	923
UK	1910	n/a	0	n/a	5060	n/a	6970	7895

n/a = not available

¹Includes former GDR

Source: Statistics and Economics Committee IWSA September 1999

8.2 water delivery (million m³), sewer connection & sewage treated

	Household and small business		Industry and others		Total delivery		Inhabitants (millions)		Supply rate %	Sewer connection rate %	Sewage treated %
	1980	1997	1980	1997	1980	1997	1980	1997	1997	1997	1997
Austria	365	424	225	244	590	628	7.55	8.08	90.0	76.0	100.0
Belgium	366	428	208	151	574	579	9.85	10.17	98.0	71.0	36.0
Denmark	285	250	166	129	451	397	5.13	5.28	95.0	95.0	95.0
Finland	n/a	258	n/a	96	n/a	354	n/a	5.15	88.0	79.0	100.0
France	2085	3210	1120	1140	3205	4350	53.88	58.40	99.0	-	-
Germany ¹	3857	3966	2020	1015	5870	4961	78.27	82.05	99.0	93.0	97.0
Hungary	387	380	376	180	763	560	10.71	10.14	99.0	48.0	43.0
Italy	3945	4700	1295	1200	5240	5900	56.43	57.56	98.0	89.0	25.0
Luxembourg	24	27	10	13	34	39	0.36	10.42	99.0	98.0	97.0
Netherlands	733	948	192	188	925	1136	14.14	15.70	100.0	98.0	99.0
Spain	2146	2037	794	1335	2940	3372	37.43	39.67	97.0	66.0	-
Sweden	516	526	298	194	814	720	8.31	8.85	87.0	86.0	98.0
UK	3160	²	2070	²	5230	6959	56.31	59.01	99.0	96.0	97.0

Note: Figures relate to public water supply

¹ Includes former GDR

² UK figures are only available for measured and unmeasured supplies. Although metered supplies account for the majority of Industry and Others, it also includes some small businesses and households.

Source: Statistics and Economics Committee IWSA September 1999

8.3 specific water consumption (litres/capita/day)

	Household and small business		Industry and others		1980	1997
	1980	1997	1980	1997		
Austria	155	160	100	77	255	237
Belgium	104	118	59	42	163	160
Denmark	165	136	96	70	261	206
Finland	-	155	-	97	-	252
France	109	151	58	54	167	205
Germany ¹	139	130	52	34	191	164
Hungary	110	104	107	49	217	153
Italy	211	228	69	58	280	286
Luxembourg	183	172	76	81	259	253
Netherlands	142	166	37	43	179	209
Spain	157	145	58	95	215	240
Sweden	195	188	120	69	315	257
UK	154	²	100	²	254	324

¹ Includes former GDR

² UK figures are only available for measured and unmeasured supplies. Although metered supplies account for the majority of Industry and Others, it also includes some small businesses and households.

Source: Statistics and Economics Committee ISWA September 1999

8.4 comparison of annual water charges (200m³/year) June 1998

	Town/City	Annual charge (ECU)	GDP per capita (ECU)
Austria	Vienna	267.5	22,495
Belgium	Brussels	272.6	21,295
Denmark	Copenhagen	303.6	28,290
Finland	Helsinki	136.5	20,215
France	Paris	156.5	21,015
Germany	Berlin	350.2	21,930
Greece	Athens	155.1	8,472
Hungary	Budapest	57.4	2,836
Italy	Rome	49.6	17,462
Luxembourg	Luxembourg	288.5	31,119
Netherlands	Amsterdam	183.6	20,304
Norway	Oslo	84.8*	29,556
Portugal	Lisbon	174.2	8,348
Spain	Madrid	145.8	11,822
Sweden	Stockholm	137.6	22,714
Switzerland	Berne	239.6	31,912
UK	London	112*	18,684

n/a = not available

* = un-measured

Source: Statistics and Economics Committee ISWA September 1999

8.5 quality of bathing water 1990-1998

COMPLIANCE WITH COLIFORM PARAMETRES OF EC DIRECTIVE

	Sea Water								Fresh Water								
	1991	1992	1993	1994	1995	1996	1997	1998	1990	1991	1992	1993	1994	1995	1996	1997	1998
Belgium	85	90	82	92	97	97	100	92	86	75	58	59	56	52	85	95	96
Denmark	93	95	96	95	96	97	96	94	-	90	92	95	96	93	95	89	90
Finland	-	-	-	-	-	89	90	84	-	-	-	-	-	-	89	79	83
Germany	64	74	76	80	85	82	91	91	-	37	39	45	47	53	61	90	88
Greece	90	97	96	95	98	98	98	99	-	33	100	100	100	75	75	50	100
France	87	78	83	87	88	83	90	95	-	84	80	84	82	88	68	79	91
Ireland	97	94	96	100	98	96	97	98	-	-	100	100	100	100	100	100	100
Italy	90	92	88	86	92	92	95	94	-	87	79	81	87	89	89	89	86
Luxembourg	-	-	-	-	-	-	-	-	75	50	75	80	85	85	85	85	85
Netherlands	86	86	80	64	65	85	91	99	-	-	75	62	45	50	54	71	86
Portugal	86	83	81	83	92	86	90	89	-	-	-	29	71	50	35	25	17
Spain	88	93	95	96	97	97	97	98	-	48	61	65	64	68	65	68	73
Sweden	-	-	-	-	-	63	67	85	-	-	-	-	-	-	63	54	74
UK	76	79	80	82	89	89	88	89	-	-	-	-	-	-	-	-	100

Source: European Commission: Quality of Bathing Water (1998 Bathing Season)

8.6 bathing water quality in EC member states 1998

	Number of sampling points	% of sampling points not sampled or insufficiently sampled	% complying with mandatory values
Sea			
Belgium	39	0.0	92.3
Denmark	1,194	0.6	94.3
Finland	94	4.3	84.0
Germany	417	0.0	90.9
Greece	1,733	0.3	98.7
France	1,856	0.0	94.5
Ireland	121	0.8	98.4
Italy	4,868	0.7	94.4
Luxembourg	-	-	-
Netherlands	78	0.0	98.7
Portugal	342	0.6	88.9
Spain	1,597	0.0	97.6
Sweden	378	10.3	84.9
UK	496	0.0	88.7
Fresh			
Belgium	55	0.0	96.4
Denmark	113	3.5	90.3
Finland	357	14.9	83.2
Germany	1,656	2.5	88.3
Greece	4	0.0	100.0
France	1,553	4.4	91.0
Ireland	9	0.0	100.0
Italy	737	0.1	85.8
Luxembourg	20	0.0	85.0
Netherlands	522	9.4	85.6
Portugal	24	4.2	16.7
Spain	215	0.9	73.0
Sweden	462	23.2	74.0
UK	9	0.0	100.0

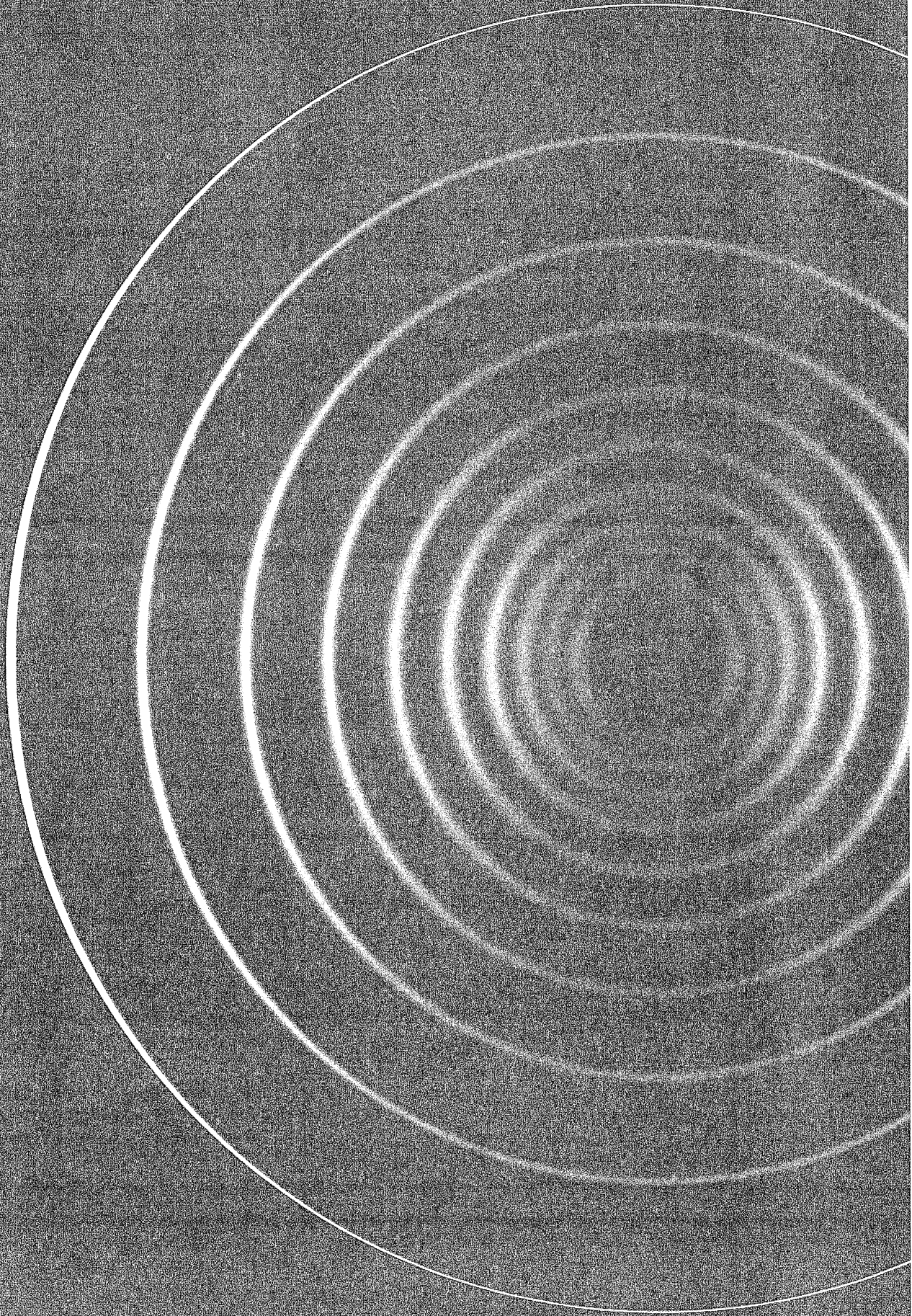
Source: European Commission: Quality of Bathing Water (1998 Bathing Season)

8.7 sewage sludge (biosolids) generation

	Quantity in dry solids/tonnes/per annum	
	Current (1994)	After UWWT Directive
Austria	180,000	250,000
Belgium	88,000	250,000
Denmark	170,000	170,000
Finland	150,000	150,000
France	800,000	1,300,000
Germany	3,200,000	3,850,000
Greece	70,000	180,000
Ireland	12,000	40,000
Italy	800,000	1,300,000
Luxembourg	7,500	15,000
Netherlands	340,000	450,000
(Norway)	(93,000)	(130,000)
Portugal	8,400	60,000
Spain	528,000	1,088,000
Sweden	240,000	240,000
UK	1,100,000	1,350,000
Total EU	7,693,900	10,693,000

Source: European Waste Water Group now Eureau 2 no updated information yet available

other water organisations



Eureau

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EUREAU is a non-profit organisation representing the interests of water suppliers and waste water operators within the European Union. It has the following objectives

- to represent the common interests of its members to the public or private community organisations responsible for dealing with the formulation of community legislation and European standards relevant to water supply and waste water
- to identify, propose, encourage and take all necessary steps in the context of the general interests of the water sector
- to make the appropriate international and national bodies and the general public aware of the relevant issues.

The European Union and European Free Trade Association countries are full members. The UK is represented by Water UK. Other European countries can apply to be observer members.

The Committee structure (requiring two UK representatives for each Commission) is

Commission 1
Drinking water: resources, treatment and quality.

Commission 2
Waste water: technical and economic aspects.

Commission 3
Legislation and economics.

Commission 4
Drinking water and waste water: standardisation and certification.

European Water Association e.V. (formerly EWPCA)

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The European Water Association e.V. - EWA - was established in 1981 as a non government, non-profit making organisation registered in Bonn, Germany. Membership is confined to professional associations and institutions that are active in the field of water management. Activities are aimed at managing the water environment and in furthering interaction and collaboration between European countries in the technical and scientific practice of managing the water environment.

International Water Association (IWA)

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The International Water Association is a new organisation resulting from the coming together of the International Water Services Association (IWSA) and the International Association on Water Quality (IAWQ). It is a non-profit membership organisation and its mission is: to promote best practice and exchange of the latest skills, techniques and knowledge of all aspects of water management; to disseminate this worldwide by all possible means including meetings, publications, expert networks and electronic media; to engage in advocacy and exchange of ideas with major agencies, promote public awareness and to provide a means whereby all the different types of organisations and professions in the water sector can exchange information.

WaterAid

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www.wateraid.org.uk

People in the UK enjoy an excellent level of water and sanitation services. In developing countries, however, the situation is very different. Over a billion people lack access to clean water and over two billion lack adequate sanitation. WaterAid exists to help those people.

WaterAid is supported in the UK by all water companies, many consultants, contractors and suppliers and thousands of individuals. WaterAid's income in 1998/99 was £9.7 million, continuing the underlying upward trend in fundraising.

As a result, WaterAid's overseas activities continue to expand. WaterAid is now 18 years old, and has in that time helped more than five million people achieve practical improvements to their water supply.

In the world's poorest countries water needs remain immense. People in these countries very much want to overcome those needs for themselves. They are willing to work hard, sinking wells or digging trenches for simply gravity-fed schemes. WaterAid supports their efforts, providing technical guidance and some of the equipment and materials. Hygiene education sessions teach good health practices to ensure that lasting benefits to health are achieved.

During 1998/99 WaterAid commissioned major research into new areas of work. The research concentrated on innovative ways of increasing its urban work and identifying new countries where it may wish to work. As a result it is in the process of setting up new Country Programmes in Madagascar and Malawi, as well as pilot projects in Mali and Burkina Faso. WaterAid is also employing an urban specialist to help identify new partnerships in urban development. These new initiatives will expand WaterAid's ability to help some of the poorest people in the world.

WRc

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WRc is a knowledge based company with a strong R & D foundation and a wide range of scientific and engineering skills in the environmental field. The company deals with issues in areas such as water supply, waste disposal, recycling, land use, contaminated land, environmental quality and risk assessment.

WRc's mission is

- to work with customers in providing solutions to their problems
- to build substantial business relationships, working with selected customers in addressing the issues facing them, ranging from defining problems to putting solutions into operation, backed up by information and training support
- to operate between regulators and the regulated and across other organisational divides to provide a cost effective service against a background of continually changing pressures facing our customers
- to work with R&D organisations and those who need to use results from research to generate business opportunities
- to develop innovative products and services which can be branded and sold to a wider range of customers
- to make use of our management expertise to lead or participate in consortia

WTI

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Tel: 0118 981 3011 Fax: 0118 981 7000
E-mail: wti@dial.pipex.com

WTI Training Group is the largest provider of specialist training services to the water industry in the UK. Services include a wide range of open courses, but 70% of our work in the water sector is now bespoke. This ranges from training consultancy to the development of qualification schemes.

The company now has 12 service divisions, each providing a range of specialist services

- Water & Environment
- Building and Facilities Management
- First Aid
- Gas
- Healthcare
- Health & Safety

- International
- JCB Operator Training
- Mechanical & Electrical
- People Development
- Rail
- Street Works

Most delegates attend one of WTI's four training centres, but many are trained at their own premises or attend courses in one of our mobile training centres.

WTI works with industry bodies on the development of training and qualification schemes and many courses are endorsed by national bodies including City in Guilds, BTEC, CABWI, CIWEM and IWO. WTI also designs and organises UK based development programmes for overseas individuals and groups and arranges the placement of UK training specialists overseas.

Institute of Hydrology (IH)

Maclean Building, Crowmarsh Gifford,
Wallingford OX10 8BB
Tel: 001491 838 800 Fax: 01491 692424
E-mail: www.nwl.ac.uk/ih/

IH is one of the component institutes of the Natural Environment Research Council. Its mission is to obtain a greater understanding of the hydrological cycle and the component physical, chemical and biological processes at local, regional and global scales. Much of its research is directed toward monitoring and predicting the effects of natural environmental change and the activities of man on the hydrological cycle.

A core programme of research is funded by NERC but about 75% of IH work involves contract research for UK government departments, international agencies, overseas governments, consultants and public and private sector businesses.

Institution of Water Officers (IWO)

4 Carlton Court, Team Valley, Gateshead
Tyne & Wear NE11 OAZ
Tel: 0191 422 0088 Fax: 0191 422 0087
E-Mail: lynn@iwohq.demon.co.uk
Website: www.iwohq.demon.co.uk

The Institution of Water Officers is a professional membership organisation for people working in the water industry. Its purpose is to promote the advancement of knowledge which it does through local and national meetings, seminars, workshops, weekend schools, technical visits, exhibitions and a variety of social events. It is also a nominated body of the Engineering Council allowing it to register members at both Eng Tech and I.Eng. level.

The Institution produces a quarterly journal *Water* distributed throughout the water industry, featuring articles on topical issues, products and services as well as Institution and industry news.

Society of British Water Industries (SBWI)

38 Holly Walk, Leamington Spa, Warwickshire, CV32 4LY
Tel: 01926 831 530 Fax: 01926 831 931
E-mail: sbwr@compuserve.com Website: www.sbwi.co.uk

SBWI services the interests of the major UK manufacturers and contractors who supply the water industry. Members meet regularly in sections devoted to specific interests: pipeline equipment; metering systems; waste water; leakage, contracting (from service laying to turnkey projects).

The main aim of the Society is to help members serve the water industry better, by keeping them well informed about topical issues, providing seminars and speakers when required, and liaising with other bodies. Members are also represented on European, British and Industry standards-making committees.

UK Water Industry Research Ltd (UKWIR)

1 Queen Anne's Gate, London SW1H 9BT
Tel: 0207 344 1821/1807 Fax: 0207 344 1859
E-Mail: ukwir@compuserve.com

UKWIR provides a framework for the procurement of a common research programme for UK water operators on 'one voice' issues. Its members are the water and sewerage companies and the water supply companies of England and Wales, the Scottish water authorities and Northern Ireland Water Service.

Since 1 April 1994, the members of UKWIR have collaborated in an 'operators' club' to carry out a rolling programme valued at about £3.5 million per year. On some projects the value is enhanced by collaborating either nationally with government departments and regulators or internationally with bodies such as the American Water Works Association Research Foundation.

Proposals for research and development projects are initiated by the water industry committees, consisting of representatives from the companies and authorities who are the members of UKWIR. The majority of the work contained in the programme is put out to open tender with tenders being sought from a wide range of companies, academic institutions and other organisations both in the UK and overseas. Individual projects are managed by project managers drawn from among the industry's research and development managers with central coordination.

In preparation for developing future programmes tailored to meet strategic business needs, UKWIR is holding a series of technology transfer workshops. A quarterly newsletter, *UKWIR News*, is published to promote the dissemination of current and future research information.

The research programme falls within the following main subject areas: water quality and health; toxicology; water resources and climate change; waste water treatment; sewage sludge; water mains and services; leakage and metering; and process control.

The Board for Education and Training in the Water Industry (BETWI)

1 Queen Anne's Gate, London SW1H 9BT
Tel: 0207 957 4580 Fax: 0207 957 4557
E-mail: ian@betwi.demon.co.uk Website:
<http://www.betwi.demon.co.uk>

BETWI is the national training organisation (NTO) for the water sector. As an NTO it provides a focal point for all education and training matters within the water sector and is the industry's principal point of contact with the Department for Education and Employment. As an NTO, BETWI's primary activities are

- to assess and respond to the education, training and development needs of employers in the water sector, including National Vocational Qualifications (NVQs) and Scottish Vocational Qualifications (SVQs), modern apprenticeships and national traineeships
- to represent to Government and others the sector's training and education interests and to respond to national education and training initiatives on behalf of the sector
- to ensure the development, review and implementation of national occupational standards, especially NVQs and SVQs
- to promote investment in people as central to competitive business performance as well as other competitiveness-based initiatives such as sector targets, lifelong learning and skills benchmarking

BETWI is a member of the International Federation of Training and Development Organisations and gained Investors in People recognition on 22 June 1998.

In corporation as a company limited by guarantee took place on 14 October 1992. Membership consists of Water UK.

British Water

1 Queen Anne's Gate, London SW1H 9BT
Tel: 0207 957 4554 Fax: 0207 957 4565
E-mail: info@britishwater.co.uk Web site:
www.britishwater.org

British Water is an association of nearly 200 of the leading organisations in the UK water and waste water industry and is thus also a key component of the UK's environmental management capability. The resources of its membership extend to water supply and sewage treatment, engineering, management and IT consultancy, civil and process contracting, equipment manufacture and supply, banks, legal services and specialist research and

training organisations. It can thus bring to global markets for water and environment-related projects, tailor-made combinations of consultancy, engineering, construction and operational and investment management skills for developments of any complexity, small as well as large.

In addition to its representational role, British Water functions through a series of focus groups concerned with concession, municipal, industrial and disinfection market opportunities in the UK and international market places, as well as domestic water treatment in the UK. Specialist sub-groups are engaged in a range of technological, legislative, regulatory and standards issues on behalf of the industry, and British Water is represented on the principal UK and European standards bodies. The organisation's objectives are

- to stimulate UK and overseas markets to the benefit of British Water members in particular and by extension, the UK water and waste water industry
- to harness, stimulate and manage the combined efforts of British Water, government and other institutions to promote the growth and competitiveness of the UK water and waste water industry
- to provide a forum for the discussion of industry issues among members and transmit informed opinion on these matters to government and other institutions
- to promote and enhance the technical expertise of the British water and waste water industry
- to provide effective services at minimum cost and inform members of all activities of British Water and the information available to them from the organisation
- to develop overseas programmes, including inward visits, to the widest benefits of members

The Certification and Assessment Board for the Water Industry (CABWI)

CABWI Awarding Body, 1 Queen Anne's Gate,
London SW1H 9BT
Tel: 0207 957 4517 Fax: 0207 957 4641
E-mail: cabwi@aol.com Website:
www.members.aol.com/cabwi

CABWI Awarding Body awards National Vocational Qualifications (NVQs) in water, waste water, waste management and customer service functions across England, Wales and Northern Ireland and increasingly overseas. In Scotland, CABWI awards Scottish Vocational Qualifications (SVQs) jointly with the Scottish Qualifications Authority (SQA).

CABWI is also an awarding body for the Street Works qualifications for supervisors and operatives contained in the two sets of regulations that cover the UK.

The Chartered Institution of Water and Environmental Management (CIWEM)

15 John Street, London WC1N 2EB
Tel: 0207 831 3110 Fax: 0207 405 4967
E-Mail: admin@ciwem.org.uk Website: www.ciwem.org.uk
CIWEM is a multi-disciplinary, professional and examining body for engineers, scientists and other professionally qualified personnel engaged in water and environmental management. The main objectives of the institution are to advance the practice of water and environmental management for the public benefit and to promote education, training, study and research in those areas. CIWEM's membership is nearly 12,000 of whom over 1,500 are overseas.

Foundation for Water Research (FWR)

FWR, Allen House, The Listons, Liston Road, Marlow,
Buckinghamshire SL7 1FD
Tel: 01628 891589 Fax: 01628 472711
E:mail: office@fwr.org.uk Web: www.fwr.org

FWR is an independent, non-profit making organisation that promotes and disseminates research on all aspects of water, waste water and related environmental issues. It has a representative membership of water related organisations throughout the world. On behalf of this membership, FWR publishes and promotes technical reports from a wide range of sources. These include a large library of information based on research funded by the Foundation.

The Foundation also supports or participates in a number of forums that facilitate the interchange of information and define outstanding research needs in specific topic areas. When collaborative research needs are identified the Foundation also manages and sponsors research projects.

Additional terms frequently encountered in relation to water and sewerage, not defined previously in Waterfacts 2000.

Abstraction

Taking of water from river, reservoir or borehole. Abstractions of surface water and groundwater in England and Wales are subject to an Environment Agency licence. Licence holders include water undertakers, general industry (particularly electricity generating companies) and agricultural concerns.

Aquifer

Underground water source – water bearing rock and soil strata.

Bathing waters

Areas designated under EC directive 76/160/EEC. Number of bathers is main criterion.

Biochemical Oxygen Demand (BOD)

The quantity of dissolved oxygen in water (mg/l) consumed under test conditions during a given period (5 days) through the microbiological oxidation of biodegradable organic matter present in waste waters. One of the standard tests used to characterise effluent quality.

Biodegradability

Ability of substance to decompose without adding chemicals.

Biological filtration

A process in which settled sewage uniformly trickles downward through a bed of inert material such as slag, moulded plastics or clinker, thus permitting contact with the biological film with which the surfaces of the medium are coated so that oxidation and clarification take place.

Blue flag beaches

Beaches which meet a number of detailed criteria for cleanliness and facilities including compliance with the EC directive's guideline bathing water standards.

Catchment

Area drained by a river or river system. Also area drained by a sewerage system.

Cess pit

A holding tank for waste water storage which is emptied on a regular basis. No treatment of the waste water occurs in the cess pit. Used by outlying properties remote from the mains sewerage systems.

Coarse screen

A screen used for removing gross solids from domestic or industrial waste water, with spaces between the bars at least 50mm wide.

Chemical Oxygen Demand (COD)

The quantity of oxygen equivalent to the amount of oxidising agent consumed in oxidising the majority of organic matter present in waste waters. Does not distinguish between the organic matter liable to be degraded readily by biological means and the more intractable forms. Can include the oxygen demand of some inorganic substances such as sulphides. Measured by testing a sample of the wastewater with potassium dichromate and sulphuric acid.

Chlorination

The application of chlorine to water for the purpose of disinfection.

Coastal waters (United Kingdom)

Defined in the Water Act 1989 as any waters which are within the area which extends landwards from baselines from which the breadth of the territorial sea is measured as far as the limit of the highest tide and in the case of any rivers, as far as tidal limit of the river.

Coliform bacteria

A group of bacteria found in the intestine and faeces of most animals. Coliforms can sometimes be found in untreated water. The treatment process removes them and disinfection prevents their reappearance in the distribution system. In water receiving discharges, faecal coliform bacteria are used to indicate the presence of sewage.

Communication pipe

That part of the pipe which conveys water from the main to the customer's house and which is in the road or footpath.

Controlled waters

Inland, coastal, territorial and ground water to which British pollution control legislation applies.

Cryptosporidium

A waterborne parasitic micro-organism, believed to originate from livestock. Cryptosporidia have been identified as responsible for a small number of acute diarrhoea cases (cryptosporidiosis).

Desalination

The removal of dissolved salts from water by distillation, reverse osmosis, de-ionization, electrodialysis or freezing.

Discharge consent

A legal document which gives permission to discharge and sets out the terms under which the discharge should be made.

Disconnection

Separation of a customer's supply from the public water network.

Descriptive consent

A consent under which discharges are controlled by imposing general rather than numerical standards.

Disinfection

The destruction of pathogens by physical or chemical means.

Disinfection by-products (DBPs)

The residual substances formed by disinfection.

Dissolved air flotation

A process which can be used for grease removal, for concentrating activated sludge, or a pre treatment stage in physico-chemical methods of treatment.

Dissolved Oxygen (DO)

Oxygen dissolved in a liquid, the solubility depending on temperature, partial pressure, and salinity, expressed in milligrams per litre. Tables giving values for the solubility of oxygen in water have been published in standard methods.

Drought

A prolonged period of dry weather, said to exist if, for at least fifteen days, on each day rainfall has been less than 0.25mm.

E. Coli (Escherichia Coli)

A bacterium taken as an indicator of faecal contamination.

Ecology

The study of interrelation between living organisms and their environment.

Environmental Quality Objective (EQO)

The description of water quality required to maintain an identified use of a body of water.

Environmental Quality Standard (EQS)

The concentration of a parameter which must not be exceeded if the EQO is to be maintained or achieved.

Estuary (UK)

The transitional area at the mouth of a river between fresh water and coastal waters.

Estuary (EC)

The transitional area between fresh water and the proper marine area. The outer part of an estuary is limited by the straight line between the furthest seawater extent of the low water line on each side of the estuary.

Eutrophication

The enrichment of water by nutrients, especially compounds of nitrogen and/or phosphorus, causing an accelerated growth of algae and higher forms of plant life to produce disturbance to the balance of organisms present in the water and to the quality of the water concerned.

Final effluent

Typically, the effluent discharged from a treatment plant after completion of treatment of a domestic or industrial wastewater.

Fine screen

A bar screen or wire mesh.

Fluoridation

Application of fluoride to drinking water at the request of health authorities as a preventive measure against dental decay.

Foul flooding

Flooding from a sewer.

Foul sewer

A sewer conveying sewage, ie waste water of domestic or industrial origin, excluding rain water or surface water.

Groundwater

Water occurring in permeable underground strata eg chalk and sand stone.

Hardness

Characteristic of waters containing dissolved calcium and magnesium salts.

Hydrology

The applied science concerned with the cycle, or precipitation, run-off or infiltration and storage, evaporation and re-precipitation.

Impounding reservoir

The traditional form of upland reservoir produced by damming water courses.

Industrial Waste Water

Any waste water which is discharged from trade or industrial premises, other than domestic waste water and run-off rain water.

Integrated Pollution Control (IPC)

The control of discharges from specified industrial premises, whether to land, air or water.

K factor

Amount by which each licensed water company can increase its charges annually on top of inflation. Controlled by Ofwat.

Less Sensitive Areas

A water body or area where the discharge of wastewater does not adversely affect the environment (See Annex II of UWWTD 91/271/EEC). In the UK, also referred to as High Natural Dispersal Areas (HNDAs).

Licence of Appointment

Legal document granting water company permission to operate.

Load

The quantity or mass of any substance transported in an effluent per unit time (the product of concentration of pollutant and effluent flow).

Mains

Pipes which carry treated drinking water.

Meter

A device for measuring length, flow, time, temperature of water.

Numeric consent

A consent in which numerical limits are set for the concentration or load of substances discharged and also for the effluent flow.

Nutrients

A substance such as nitrogen or phosphorus which provides nourishment to organisms.

Outfall

The site of discharge of a liquid from a pipe. Applied particularly to the point at which a sewer discharges to a treatment works or receiving water, or the point at which a conduit discharges the effluent from a treatment works into a receiving water.

Ozonation

The addition of ozone, particularly to a raw water or biologically treated sewage to decolorise and disinfect it. Also termed 'ozonization'.

Pathogen

A organism which is capable of producing disease.

PCBs

Polychlorinated Biphenyls – a group of industrial chemicals found in the environment.

Phenols

A group of aromatic organic compounds which may adversely affect biological sewage-treatment processes or sludge digestion, or cause taste problems in drinking water.

Plumbo-solvency

The ability to dissolve lead.

Polluting load

The quantity of polluting matter entering a treatment plant or in the effluent discharged into a receiving water during a given period.

Population equivalent (PE)

The amount of oxygen demanding materials discharged by one person each day.

Private sewer

A sewer which is not a public sewer as defined in section 20 of the Public Health Act 1936.

Public sewer

A sewer vested in a water authority by virtue of the provisions of section 20 of the Public Health Act 1936 as amended by section 40 and paragraph 33 of the 8th schedule to the Water Act 1973.

Receiving water

Inland and coastal water receiving treated effluent to which pollution control legislation applies generally.

Red list

List of potentially dangerous substances whose discharge to watercourses is controlled under integrated pollution control.

Screenings

The gross solids including rags and plastics in sewage are intercepted by screens and removed manually or by raking mechanisms.

Sedimentation

The process by which settleable solids are removed from sewage by passing it through a tank at a rate that allows the solids to gravitate to the floor to form sludge.

Sensitive areas

A water body or area where more than secondary treatment is required for waste waters discharged under UWWTD 91/271/EEC.

Septic tank

A type of sedimentation tank in which the sludge is retained sufficiently long for the organic content to undergo anaerobic digestion. When sludge is eventually removed to a sewage treatment works, some is left in the tank to act as a 'seed' to initiate further digestion. Used for receiving the sewage from houses and other premises which are too isolated for connection to a foul sewer.

Service reservoir

A reservoir where treated water is stored.

Sewage (or Waste Water)

Water-borne wastes from domestic uses of water, derived from households or similar uses in trade and industry. Storm sewage is that flowing to a treatment works in wet weather or discharged from storm overflows, when the sewage is diluted to a greater or lesser extent with rain water.

Sewage Sludge (also known as Biosolids or Sludge)

A by-product arising from the treatment of sewage or from septic tanks or similar installations. (See Article II of Directive 86/278/EEC for full definition.)

Sewage (treatment) works (STW)

A term for the structures, plant and equipment used for collecting and treating sewage, normally with some sludge drying.

Sewer

A pipe conveying wastewater or sewage discharged into it from two or more house drains.

Sewerage

A system of pipes and mechanical appliances for the collection and transportation of domestic and industrial wastewaters.

Sludge cake

Sludge that has been dewatered to the extent that it can be handled as a solid, usually containing more than 15 per cent dry solids, depending on the type of sludge and method of dewatering.

Soft water

Water which forms an immediate lather with soap and has a total hardness which is typically less than 60 milligrams per litre (as CaCO₃).

Statutory water company

A company authorised immediately before the passing of the Water Act 1973 by any local statutory provision to supply water, or a company in whom the assets of any company so authorised have subsequently become vested.

Statutory Water Quality Objective (SWQO)

Water Quality Objective set down in legislation.

Storage reservoir

A reservoir for storing untreated water.

Storm sewage overflow

A device to prevent overloading of the sewerage system during storm events.

Storm sewage tank

A tank into which, in wet weather, is diverted all the sewage and rain water reaching a treatment works in excess of that which is to receive biological treatment. Its purpose is to store as much of the storm sewage as possible, for return to the works inlet after the flow has returned to normal, and to remove settleable solids from the remainder which overflows from the tank to a receiving water.

Streptococci

Bacterial indicator of faecal contamination of water.

Supply pipe

That portion of pipe which conveys water from the main to the customer's house and which is on the customer's property.

Surface water

The run-off from paved and unpaved roads, buildings and land.

Suspended solids

In sewage analysis, those solids retained after filtration.

THM

Trihalomethanes: by-products of chlorination.

Total dissolved solids (TDS)

The concentration of dissolved solids in a waste water or effluent, ie the residue after evaporation and drying, expressed in milligrams per litre of sample.

Trade effluent

Waste water produced by trade and industry – not domestic sewage.

Transfer (water)

System where drinking water or raw water is moved around a region.

Trunk sewer

A sewer which receives many tributary branches or discharges from other large sewers and serves a large area.

Turbidity

Interference with the passage of light rays through a liquid, caused by the presence of suspended matter.

Ultraviolet (UV) treatment

Treatment of drinking water or effluent with UV rays to neutralise bacteria.

Upper tier limit

An absolute numerical limit in a consent to discharge.

Water table

Upper surface of the saturated zone in the ground.

Water treatment

The process of converting raw untreated water to a public water supply safe for human consumption. Can involve, variously, screening, initial disinfection, clarification, filtration, pH correction, final disinfection.

Water (treatment) works (WTW)

Works which treat raw water to produce potable water for public supply.

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Here are ours !

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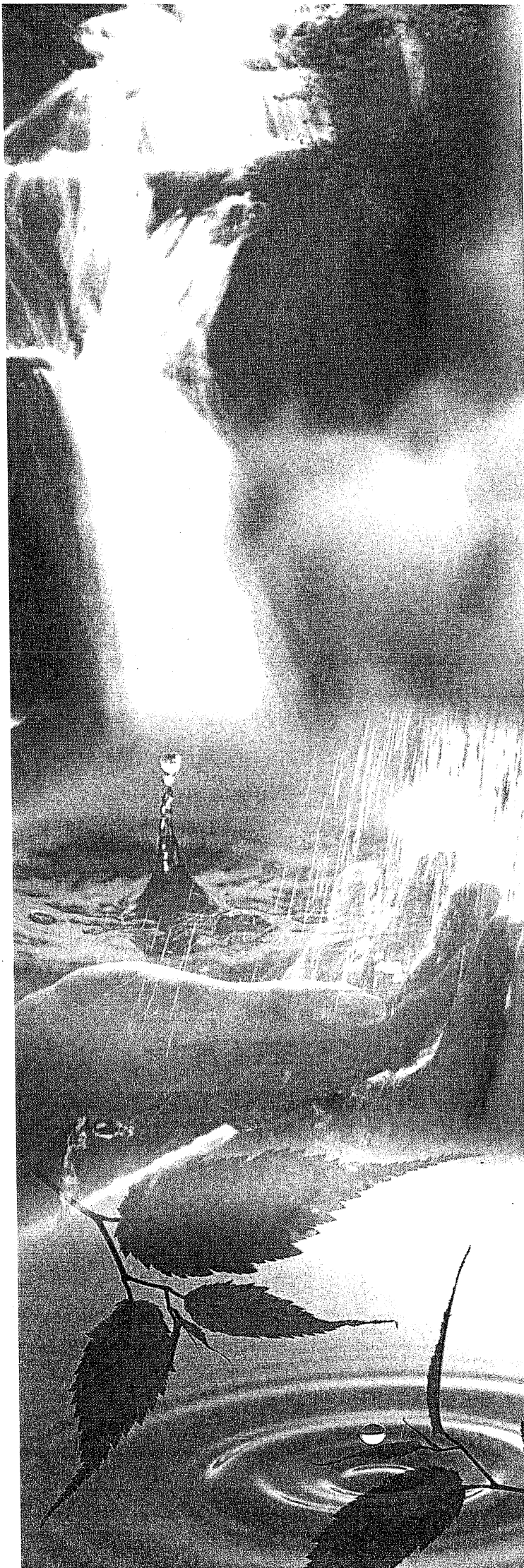
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Please make cheques payable to Water UK.

FORM G/90

General conditions of contract for water industry lump sum plant contracts which are based on Model Form 'A' General Conditions of Contract, recommended by the Institution of Mechanical Engineers, the Institution of Electrical Engineers and the Association of Consulting Engineers.
Published 1990, 45 pages, price £10

FORM P

Although no longer supported by Water UK Form P is still widely used and provides standard amendments to the Model form of conditions of contract for process plants suitable for lump-sum contracts in the United Kingdom, 1981 edition ('Red Book') as published by the Institution of Chemical Engineers.
Published 1991, 6 pages, price £10

GUIDANCE ON THE HEALTH HAZARDS OF WORK INVOLVING EXPOSURE TO SEWAGE

Prepared by the WSA Health and Safety Technical Group in consultation with the Health and Safety Executive Utilities National Interest Group. It will be of interest to employers and managers in water companies, local authorities, the civil engineering and plumbing industries and to others whose work may involve contact with sewage.
Published 1995, 10 pages, price £10

RADON IN AIR OCCASIONAL GUIDANCE NOTE

Prepared by the Water Services Association Health and Safety Technical Group, in consultation with the Health and Safety Executive Utilities National Interest Group, representatives of the water industry and the National Radiological Protection Board (NRPB). The publication offers guidance on radon in air which is specifically for circumstances in the water industry. It would also be of interest to other utilities and organisations, consultants, contractors and designers involved with a work force who enter enclosed spaces under ground.
Published 1997, 20 pages, price £20

PRINCIPLES OF WATER SUPPLY HYGIENE AND TECHNICAL GUIDANCE NOTES

A series of principles developed by the industry to be used as a framework in which to apply their own good practice.
Published 1998, 8 pages, price £5

WATERFACTS '98, '97, '96, '95, '94, '93, '92, '91, '90, '89

Brings together basic statistics, including water supply, charges, income and expenditure, manpower as well as describing the structure and regulation of the water industry.
Published: 1998 (80 pages, £30) 1997 (70 pages, £20), 1996 (70 pages, £15), 1995, 1994, 1993, 1992, 1991, 1990, 1989, 60 pages, price £10

THE WATER INDUSTRY MAP

Published 1999, poster size, £25

WRc publishes a range of books, manuals, reports, software and multimedia products. A number of titles are produced in association with Water UK including:

- Civil Engineering Specifications for the Water Industry (CESWI)
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- Managing Leakage
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