NRA

National Rivers Authority

Wessex Region

ENVIRONMENT AGENCY

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PUBLIC WATER SUPPLIES IN

THE NRA - WESSEX REGION

INITIAL REPORT 1990

PREFACE

The National Rivers Authority (NRA) has a duty under Section 143(2) of the Water Act 1989 to collate and publish information concerning the demand for water and the provision of water resources. This particular document reports the public water supply situation within the Wessex Region at the outset of water privatisation.

In the NRA Wessex Region there are five supply undertakings which supply the overwhelmingly largest proportion of water to the public. From these suppliers the NRA has sought information about water consumption, available resources, future demands and intentions to meet those demands.

Population data has been supplied by the County Councils in the region. Water supply data has been provided by the individual supply undertakings and the NRA's role has been one of presenting these in a consistent format.

The conclusions arising from this exercise are those of the NRA and may not coincide with those of any one of the constituent supply undertakings.

N F Reader
Regional General Manager

2 July 1990

PUBLIC WATER SUPPLIES IN THE

NRA - WESSEX REGION

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C O N T E N T S

LIST OF FIGURES AND TABLES

1. INTRODUCTION

The Wessex Region of the National Rivers Authority operates across the counties of Avon, Somerset and Dorset and parts of Devon, Gloucestershire, Hampshire and Wiltshire.

Consumers living within the Region are supplied with water by one of nine Supply undertakings. The area of supply of the undertakings is shown in Figure 1.1. To four of these undertakings the region is a very minor part of their areas of supply and is fed by external water resources. These four are not considered in this report. The other five undertakings supply water wholly or in the greater part to consumers living within the Wessex Region. Two of these five companies, the Bournemouth and District Water Company and the West Hampshire Water Company, now have common ownership and management but still operate as separate companies.

This report sets out the position regarding forecast growth in demand and resource development strategy for each of the five supply undertakings, as at 1st September 1989, the date upon which the National Rivers Authority was formed.

Section 2 of this report gives an outline of the population statistics, and of historic and forecast growth in population. The County Councils have provided population data and growth forecasts.

Section 3 reviews the history of recent consumption forecasts. Meetings have been held with four of the supply undertakings, and the fifth has responded to enquiries by letter, enabling a general picture of the demands and resources to be built up.

In Section 4 there is a graph of the actual consumption, forecast consumption and available resources for each of the supply undertakings. Comments of particular significance to the water resources or demands of any company are on matters as have been highlighted in dialogue with each. A description of the area of supply is included.

Section 5 gives an outline description of the recently commissioned Blashford Lakes Scheme, singled out in view of its immediate relevance to the needs of two separate supply undertakings.

Section 6 provides brief summaries of the NRA's perception of the level of resource provision for each supply undertaking while having regard to the development of policies within the NRA for the conservation and proper use of water resources.

In July 1990 a copy of the draft report was sent to each of the five supply undertakings, and comments were sought from each. This final report incorporates the comments received from all the undertakings.

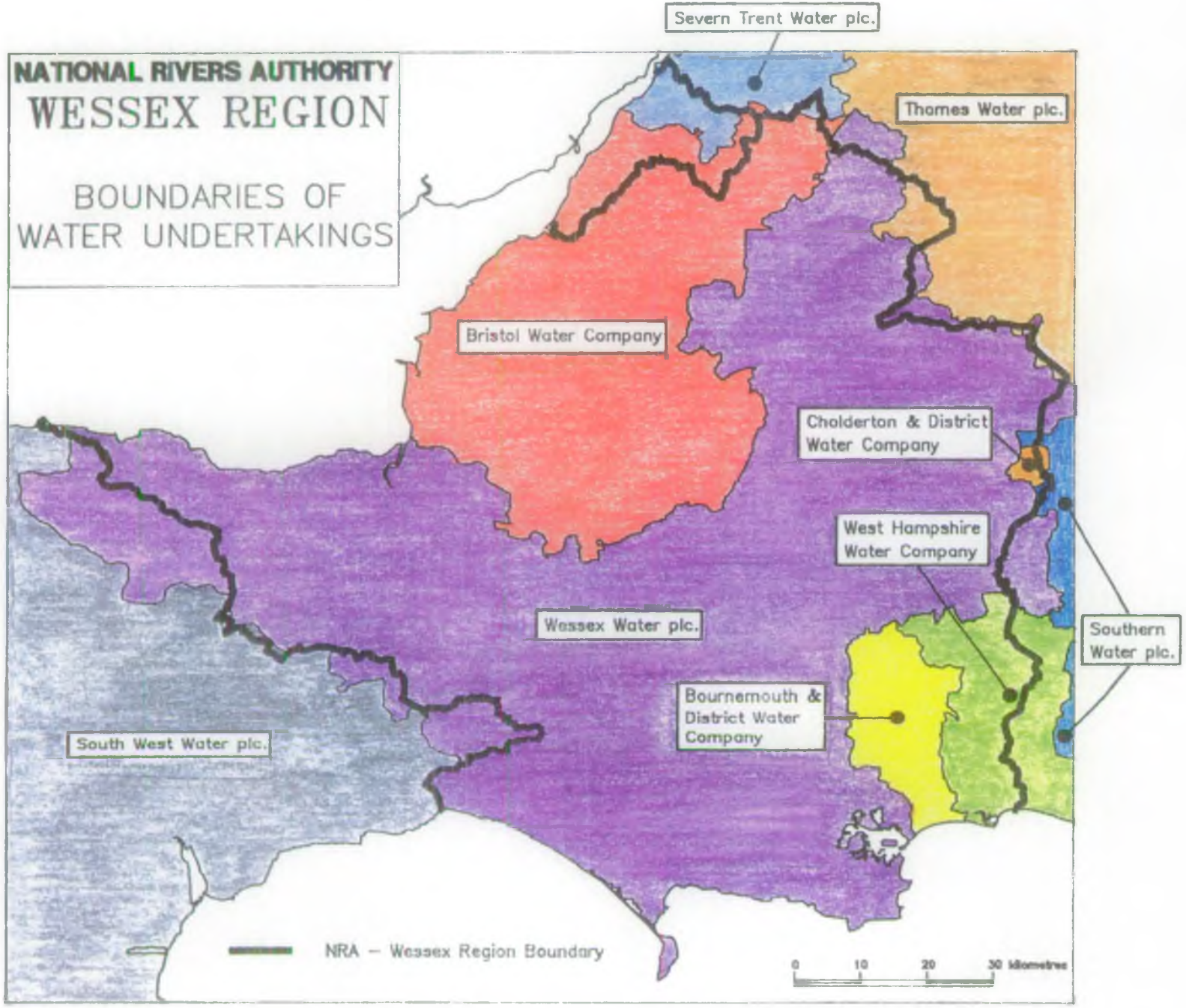

NATIONAL RIVERS AUTHORITY
WESSEX REGION
BOUNDARIES OF
WATER UNDERTAKINGS
Severn Trent Water plc.
Thames Water plc.
Bristol Water Company
Cholderton & District
Water Company
West Hampshire
Water Company
Wessex Water plc.
Southern
Water plc.
Bournemouth &
District Water
Company
South West Water plc.
NRA – Wessex Region Boundary
0
10
20
30 kilometres

Figure 1.1

2. POPULATION

According to a recent publication (1) the population of the South West of England (which includes nearly all of the NRA Wessex Region and all of the NRA South West Region) has since 1981 been increasing at the second highest rate in the country . The total increase between 1981 and 1988 was 5.8%, compared to 7.3% in East Anglia.

This growth is forecast to continue until 2001, with an increase of 7.6% between 1988 and 2001 in the South West of England. Again this is second only to the rate of growth expected in East Anglia.

Estimates of the population within each county which lie within the NRA - Wessex Region are given in Table 1 for 1981 and 1988 and forecasts are given for 2001.

These figures are illustrative only, and are not taken into account in the consumption forecasts given in Section 4.

Statistics from the OPCS show that most of this increase is due to migration into the area rather than natural increase. This suggests that there is a large volume of house building in the region to accommodate these people. Each of these new houses will require a connection to the water supply system.

It is estimated that the population within NRA Wessex Region was 2,438,000 in mid-1988.

TABLE 1

Population Estimates and Forecasts

The figures given are the population for each county which lie within the NRA - Wessex Region.

COUNTY	OPCS FIGURES 1981	1988	COUNTY FIGURES 2001
AVON	929100	954300	974430
DEVON	300	330	400
DORSET	592630	649150	726310
GLOUCESTERSHIRE	17550	18930	20320
HAMPSHIRE	30000	33550	36510
SOMERSET	417540	443670	495750
WILTSHIRE	325260	338070	367680
TOTAL POPULATION IN NRA - WESSEX REGION	2312380	2438000	2621400
RATE OF GROWTH OF POPULATION IN NRA - WESSEX REGION FROM 1981 - 1988			5.43%
FORECAST RATE OF GROWTH OF POPULATION IN NRA - WESSEX REGION FROM 1988 - 2001			7.52%

3. CONSUMPTION FORECASTS

Forecasts of water consumption for the region were previously conducted on a regular basis by Wessex Water Authority. The most recent were made in 1984 and then 1986. The 1984 review was published as a supplement to the 1985 'Wessex Plan' (2), and the forecasts were produced using linear trend analysis.

The 1986 review was published in June 1987 (3) and was based on a more acceptable component analysis. The results remain the most reliable foundation from which to examine competing claims for new resources and the basis of the method is therefore described here in some detail.

Consumption was divided into five key components:-

Domestic
Tourism
Industry (other than Tourism)
Unmeasured non-domestic and miscellaneous
Waste

These five components cover the conventional categories of water use, and different rates of growth can be applied to different components to determine the effect on the consumption forecasts.

The domestic component was calculated using population statistics and the per capita consumption. Studies had been carried out on small groups of houses to determine the per capita consumption, and the growth in this consumption was estimated by sub-dividing into elements of domestic water use, and analysing future use in each category.

Consumption due to tourism is made up of measured and unmeasured consumption. Measured consumption was obtained from customer billing records, and unmeasured consumption was made up by using bed occupancy rates with a per capita allowance. Growth was based on the British Tourist Authority's strategy.

For the 1986 review, consumption for industry, (other than tourism), was obtained from the billing records, and industries were grouped into seven main types. Growth in consumption for each type was based on economic forecasts prepared by Cambridge Econometrics Ltd. These take account of:

- historic and forecast output of each sector of industry
- historic and forecast employment for each sector of industry
- historic trend in water consumption of each industry
- national and international prospects for the world economy.

The Component 'Unmeasured non-domestic and miscellaneous' covers water use in small businesses, shops, offices and building sites which are not metered. Miscellaneous usage provides for firefighting, mains flushing and water lost from burst mains. A per capita allowance was made for this category.

Waste was expressed in terms of litres per property per hour and the figures were derived from night flow measurements reduced for legitimate domestic night use and metered night use.

Components of consumption were totalled and compared with measured actual consumption for the various areas. Where discrepancies occurred the figures were checked and amendments made to reconcile the totals.

There has been no further comprehensive review of consumption forecasts since that published in June 1987, although three undertakings have updated their own forecasts as described in Section 4. The forecasts prevailing at the time of our enquiries are summarised in Table 2 and include the updates provided by the three undertakings.

TABLE 2

Average Daily Consumption Forecasts produced by Supply Undertakings within the Wessex Region of the NRA.

COMPANY	1985/86	1991/92	2001/02	2011/12
Bournemouth and District Water Company	63.64 (64.00)	69.89 (70.84)	81.69 (81.33)	95.49 (87.28)
Bristol Water Company	311.30 (317.00)	326.00 (330.06)	377.00 (364.88)	426.00* (392.45)
Cholderton and District Water Company	0.57 (1.00)	0.65 (1.00)	0.81 (1.00)	1.00 (1.00)
Wessex Water Plc	401.00 (379.60)	433.00 (402.28)	495.00 (458.10)	529.00 (501.47)
West Hampshire Water Company	43.42 (43.42)	47.67 (47.67)	55.83 (55.83)	63.34 (62.34)

NOTE: Figures in Brackets are the Forecasts prepared by Wessex Water Authority using Component Analysis in 1986.

All figures are given in Megalitres per day (Ml/d)

* This is the Forecast for 2008

4. DEMANDS AND RESOURCES FOR EACH WATER COMPANY

This section is a collation of information supplied by the supply undertakings. For each supply undertaking there is a graph showing the actual consumption, the latest forecast consumption and the available resources. The following text focuses on items of particular significance to each undertaking.

4.1 Bournemouth & District Water Company

Area of Supply

Bournemouth and District Water Company supplies water to Bournemouth, the satellite towns to the north, such as Ferndown, Verwood and West Moors, and Wimborne Minster. It also supplies a large rural area to the north of Wimborne Minster and Ferndown, covering the greater parts of the catchments of the River Allen and the Moors River.

The population figure used by the Company is 256,000, and includes the resident population plus an allowance of 10,000 for visitors. The figures are derived from County Council figures and estimates provided by the local tourism office.

Consumption Forecasts

Bournemouth and District Water Company still uses linear trend analysis for their consumption forecasts. It produces a range of values based on different estimates of growth for both average and peak consumption. The most recent forecasts are shown on Figure 4.1, together with the forecasts produced in 1986 by Wessex Water Authority using component analysis.

The Bournemouth and District Water Company monitors the nightline between 3.00 a.m. and 4.00 a.m. each day. The current figure is 8.9 litres/property/hour, but this figure includes legitimate night time use as well as waste. In this holiday area the Company believe that night time usage is higher than average and regard this figure as reasonable.

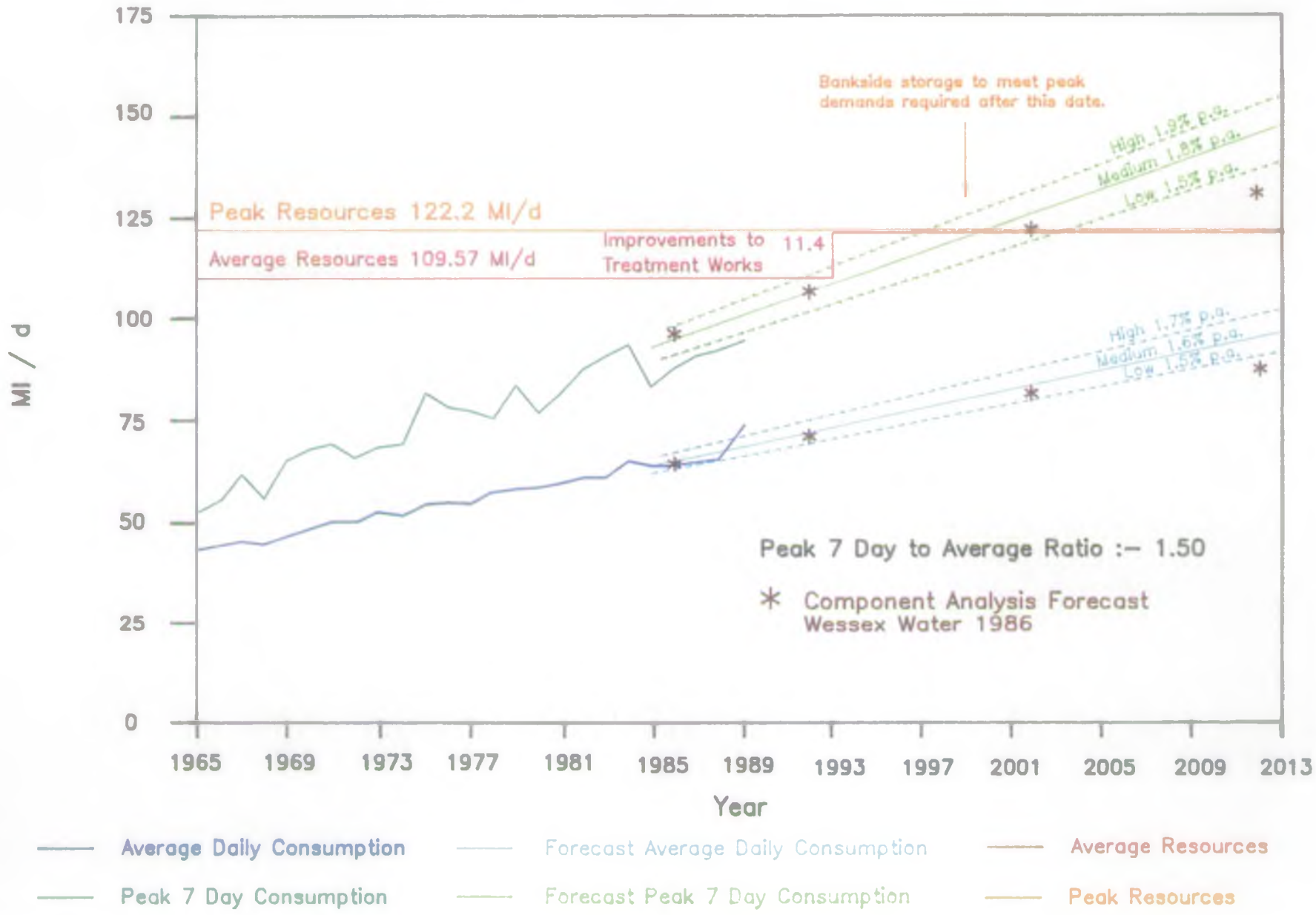
Resources

Bournemouth and District Water Company holds 4 licences for the abstraction of water. Three of these, for the abstractions from the Rivers Avon and Stour, and from a well at Wimborne, are Licences of Right. The fourth, for groundwater abstraction at Stanbridge also includes provision to provide augmentation to the flow in the River Allen.

The Company obtains most of its water from the lower reaches of the rivers Avon and Stour. The reliable yield of all sources available for supply is 122.2 Ml/d, of which 1.3 Ml/d is transferred to the Shaftesbury area of Wessex Water. This leaves 120.9 Ml/day as the reliable yield available in the summer under 2% drought conditions. This yield is sufficient to meet the forecast peak day consumption until the end of this century. The available resources are illustrated on Figure 4.1.

NRA – Wessex Region

Bournemouth & District Water Company – Consumption & Resources



June 1990

Figure 4.1

To meet peak demand beyond this century, the company are investigating the provision of bankside storage lagoons at Longham, at their existing site between Bournemouth and Ferndown. Water from both the Stour and the Avon would be used to fill these lagoons, and investigations are in progress into the quality of the mixed waters. There is no intention to increase abstraction licences.

The company is currently carrying out improvements to the treatment facilities to increase the capacity of the Longham works. Improvements are scheduled to be commissioned at the end of 1993. By then the treatment capacity will match the reliable yield of water sources.

The Company has never in its history had to apply any form of restriction on consumption. It is proud of that record, and feels it has contributed to the success of Bournemouth as a tourist resort. The Company has stated that the impact of tourism is one reason why the per capita consumption in the Company's area is high, and also why there is a ratio of 1.50 for the peak 7 day to average consumption.

4.2 Bristol Water Company

Area of Supply

The Bristol Water Company supplies approximately 1,032,000 people living in an area which includes Bristol, Weston-Super-Mare, Burnham, Street and Glastonbury, Frome and extends to Tetbury in the North. The area includes the Mendip Hills in the South.

Consumption Forecasts

The Company use component analysis to produce their consumption forecasts, and then translate these into an average percentage growth per annum to cover the forecast period.

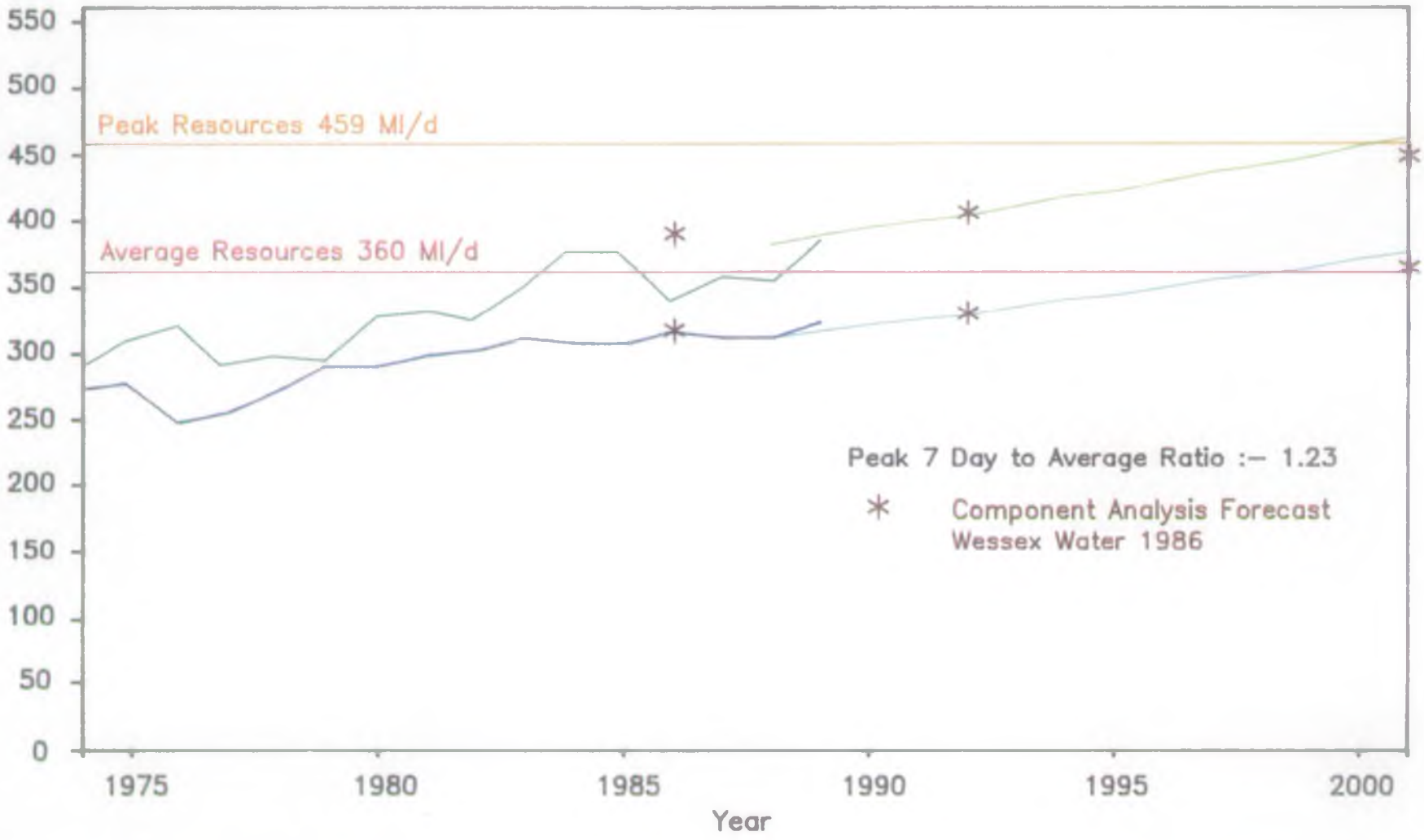
The annual growth in average demand is calculated to be 1.25%, whilst the peak 7 day demand is forecast to grow at 1.5% per annum. This is illustrated in Figure 4.2, which also shows recent consumption and the resources available to the company.

The figures produced by Wessex Water Authority in 1986, using component analysis are also shown on this figure. It can be seen that the forecast growth from this method for average daily consumption diverges by 5% by 2001. The Company is predicting a greater increase than that forecast using component analysis, which might bring forward the date by which the next resource development is required unless alternative distribution or treatment improvements can be introduced.

The Company applies further factors to its forecast average annual consumption. To cover consumption in a dry year the forecast consumption is increased by 3% and a further addition of 3% is made to create a planning margin, which allows for fluctuations in the rate of development within the Company's area of supply.

NRA – Wessex Region

Bristol Water Company – Consumption & Resources



June 1990

Figure 4.2

Resources

The Company has over 38 licensed sources, the majority of them for supplies from boreholes or springs. The Resources available to the Bristol Water Company fall into 3 categories:- impounding reservoirs, river intakes and groundwater. Surface water is drawn from impounding reservoirs in the area south of Bristol, principally Chew Valley, Blagdon and Cheddar. They are capable of producing 105 Ml/day to meet the average annual demand and 204 Ml/d to meet the peak 7 day demand. This latter figure is constrained by the capacity of the Treatment Works.

The Company draws groundwater from springs and boreholes in the Mendips and in the southern Cotswolds, to give an average yield of 90 Ml/d. The yield available to meet the peak 7 day demand is slightly less, estimated to be 83 Ml/d. The reduction is because the peak 7 day demand is assumed to occur in the Summer when the water table is generally lower, and the groundwater has to be raised through a greater height to reach the surface. Consequently the output from the pumps is reduced.

River water is drawn from the Gloucester and Sharpness Canal at Purton. The Company calculate that they will draw 165 Ml/d to meet the average annual demand, which will rise to 172 Ml/d to meet the peak 7 day demand. The river water is used to make up deficits between demands and the resources provided by the groundwater and the impounding reservoirs. A bulk supply agreement exists enabling Wessex Water Plc to take up to 11 Ml/d to augment supplies in the Bath area, from a pipeline fed from the rising main out of Purton. Any water taken from this source is not included in the consumption figures quoted for Bristol Water Company. The Company also provides a non-potable supply to a chemicals factory in Avonmouth.

The available resources are sufficient to meet peak 7 day demands until 1998, and average demands until 2000. However, the introduction of a 'planning margin' to the average annual demand forecasts means that the next source should be commissioned in 1994.

There are currently investigations in progress to determine whether it is possible to use water from the River Avon at Bath to augment Chew Valley Lake. These investigations are particularly concerned with the quality of the mixed water, and its suitability for treatment. The other option under consideration is an increase in the water taken from the Gloucester and Sharpness Canal.

4.3 Cholderton and District Water Company

Area of Supply

The Cholderton and District Water Company is the smallest statutory water company in the country, and was formed to supply the Cholderton Estate. This includes the villages of Cholderton and Shipton Bellinger. It is estimated that the total population served by the company is approximately 2000.

Consumption Forecasts

The amount supplied by the Company is very small, and has little effect on the total consumption within the Wessex Region. It has, therefore, been largely ignored during previous consumption forecasts. In 1986, for example, the forecast was for consumption to remain constant at 1 Ml/d from 1985/86 until 2011/12. In practice, demands are at present somewhat less than this figure, averaging at 0.6 Ml/d at present, with a peak consumption of 0.75 Ml/d.

Figure 4.3 shows the recent actual and average consumption and a forecast of growth. This forecast was produced by NRA Wessex and has been agreed by the water company.

The Cholderton & District Water Company has a passive waste policy.

Resources

The Company holds one licence only for groundwater abstraction from either of two boreholes. The licensed quantity is sufficient to meet average demand until approximately 1999, when the company expect to apply for a further licence to abstract groundwater. The existing daily maximum is sufficient to meet peak demands until beyond 2015.

The Company is particularly concerned about the potential vulnerability of its boreholes to contamination, as both lie within the same catchment area, and are less than 1.5 kilometres apart. Traces of contaminants have been detected by the Company's own monitoring programme, but levels of such contaminants have not been in excess of figures quoted by EEC directives.

In this respect the Company is also keenly aware of development proposals in the locality which may affect the sources. Recent concern has been expressed about a proposal to put a waste disposal site on the boundary of the catchment area.

4.4 Wessex Water Plc

Area of Supply

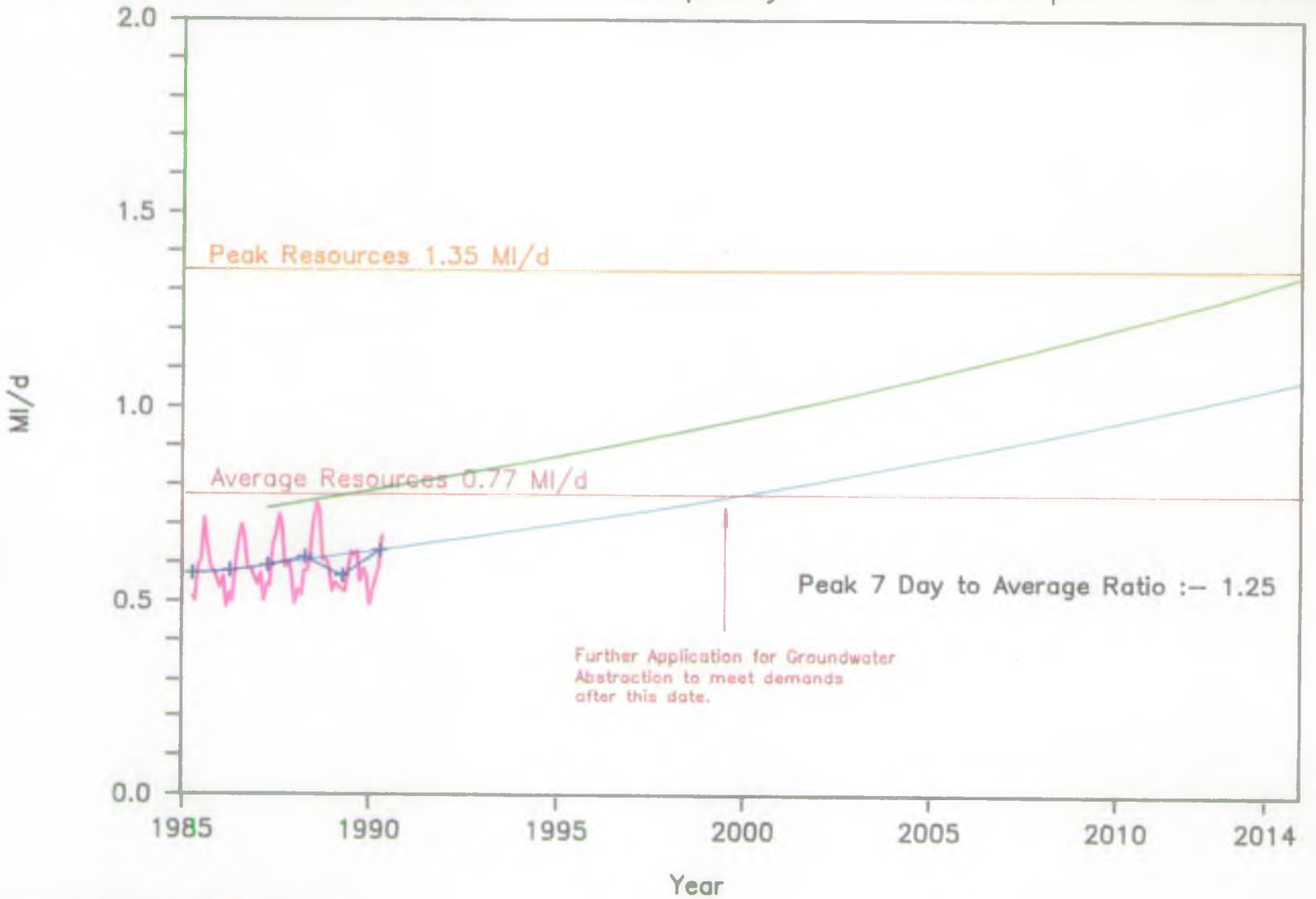
In both area and population supplied, Wessex Water Plc is the largest of the supply undertakings within the Wessex Region of the NRA. The area of supply is diverse, covering Exmoor in the west to Salisbury Plain in the east, and from the south coast to the Cotswolds in the north. It includes Bath and towns to the east, Salisbury, Poole, Weymouth, Yeovil, Taunton and Bridgwater.

The area is now operationally one, following privatisation of the water authorities. Prior to 1 October 1988 the area operated as 3 divisions: Avon & Dorset; Bristol Avon; Somerset.

It is estimated that Wessex Water Plc supply approximately 1,105,000 people.

NRA – Wessex Region

Cholderton & District Water Company – Consumption & Resources



Average Daily Consumption

Actual Consumption

Forecast Average Daily Consumption

Forecast Peak 7 Day Consumption

Average Resources

Peak Resources

June 1990

Figure 4.3

Consumption Forecasts

Prior to privatisation, Wessex Water Plc, in common with all other water undertakings, prepared an Asset Management Plan covering all aspects of the business. As part of this exercise the regional demand forecasts were revised.

Those forecasts are shown on Figure 4.4, as are the historic consumptions and available resources. This produces a slightly false view of the situation with regard to available resources because the trunk distribution system inherited from the three divisions was not designed to permit bulk transfers across the divisional boundaries. Surplus resources in one former division are therefore not readily available to overcome deficiencies in another. However, an accelerated programme of pipelaying has been undertaken by Wessex Water Plc during the past 18 months to reinforce the trunk distribution system.

Resources

Wessex Water Services has over 125 sources of water ranging in size from the Wimbleball Reservoir on Exmoor which is licensed for 31.8 Ml/d throughout the year to small borehole sources which are licensed for less than 0.1 Ml/d.

The total yield of these sources available to meet average annual demands is 510.3 Ml/d. Of this total, 71.4% comes from boreholes, 6.2% from springs, 2.3% from rivers and the remaining 20.1% from impounding reservoirs. In calculating these totals it has been assumed that the yield is the reliable yield under 1 in 50 year drought conditions, or the annual licensed quantity divided by 365, whichever is the less.

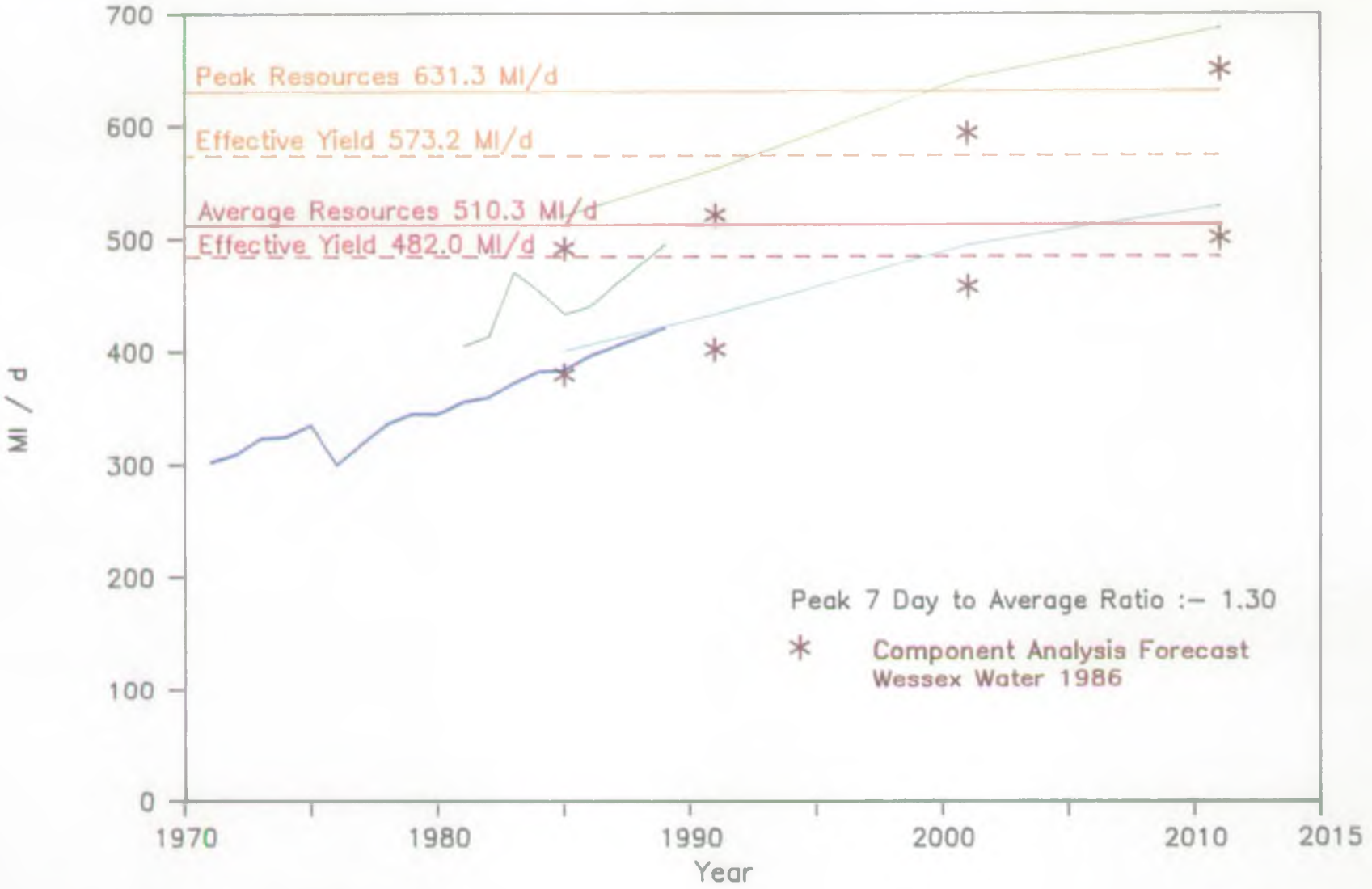
To meet the peak 7 day demand in the summer, Wessex Water Plc has 631.3 Ml/d available. 69.1% of this comes from boreholes, 6.7% from springs, 1.8% from river intakes and the remaining 22.4% from Impounding reservoirs. It has been assumed that the yield is either the summer output during a 1 in 50 year drought, or the peak daily licensed quantity, or if appropriate the summer licensed quantity. The lowest of these figures has been used to determine the total yield.

It should be noted that these figures do not provide a picture of the resource situation of Wessex Water Plc. Many of the sources do not have sufficient pump or treatment capacity to utilise all of the available resource, defined by the licenced quantity or the assessed source yield during a 1 in 50 year drought. The Company therefore use the term 'effective yield' to give an indication of the amounts available to meet forecast consumption.

The Company consider that the effective yield of their sources to meet average annual consumption is 512.1 Ml/d. This is higher than the 510.3 Ml/d calculated by the NRA as the available resource. At several sources (including, but not limited to, Corfe Mullen, Sturminster Marshall, Friar Waddon, Nutscale and Castleton) the Company claim that the annual effective yield is greater than the annual licenced quantity which leads to the divergence in estimates.

NRA – Wessex Region

Wessex Water Services plc – Consumption & Resources



Average Daily Consumption — Forecast Average Daily Consumption — Average Resources

Peak 7 Day Consumption — Forecast Peak 7 Day Consumption — Peak Resources

June 1990

Figure 4.4

The 'Effective Yield' lines shown on Figure 4.4 are as calculated by the NRA from the figures derived from the definitions of available resources given above. These figures are also less than those generally quoted by Wessex Water Plc for effective yields.

The discrepancies appear to be due to differences in definition of the various yields. A review of the yields is expected to be completed in 1991.

Resource developments planned by Wessex Water Plc fall into three categories:-

i) Those which uprate the effective yield, by for example, increasing pump or treatment capacity. These will not increase the licenced quantity or the source yield, and therefore do not appear in Figure 4.4. Examples of this category are Leckford Bridge, where uprating can improve the effective yield by 0.7 Ml/d at peak times and the Shrewton/Wylye boreholes where an increase of 1.9 Ml/d is possible by installing new or additional pumps.

ii) Developments which are fully investigated and planned, and in many instances are in the initial stages of implementation. These would appear on Figure 4.4, as they provide an increase in the source yield available to the water undertaking.

iii) The final category includes developments which have not been investigated and appraised, or which are uncertain in their timing. Further phases of the Blashford Lakes Scheme are in this category, as the implementation of these is dependent on the rate of extraction by the mineral companies and on satisfactory Abstraction Licences. Other examples are a contentious groundwater abstraction proposed near Amesbury, and further development of the Wimbleball Lake source as a replacement for the Avalon Lakes scheme abandoned in December 1989 due to the high estimated cost. None of the projects in this category are included in Figure 4.4.

The available average resources are sufficient to meet forecast average consumption until 2014, while the available peak resources are sufficient until 2007. However, measures to increase the effective yield are necessary before 1995 when otherwise the peak 7 day consumption would exceed the current peak effective yield.

4.5 West Hampshire Water Company

Area of Supply

The West Hampshire Water Company supplies an area straddling part of the eastern boundary of the Region. Approximately half the company's area lies within the Wessex Region of the NRA, including Christchurch, Ringwood, St Leonards, St Ives and the Avon Valley from near to the Ebble confluence to the south coast.

To the east, in NRA Southern's region, the company supplies Lymington, Beaulieu and a large part of the New Forest, and also provides an industrial supply of non-potable water to the oil refinery at Fawley. It is estimated that the total population served by the company is approximately 170,000.

Consumption Forecasts

The West Hampshire Water Company has adopted the component based forecast produced by Wessex Water Authority in 1986 as its preferred forecast. Since this forecast was produced consumption has not diverged from the forecast line by a sufficient margin to require a revision of the consumption forecasts.

Resources

The Company holds 3 licences to abstract water within the Wessex Region of the NRA, and all are Licences of Right.

The largest licence is for the abstraction of water from the River Avon at Knapp Mill, just north of Christchurch. This permits the abstraction of nearly 33,200 Ml in a year, up to a maximum of 113.65 Ml in any one day. Of this, half of the annual total and up to 45.46 Ml in any one day may be supplied to the Oil Refinery at Fawley as a non-potable supply. This supply is not included in the graphs shown on Figure 4.5.

The other two licences are both for groundwater abstraction at Hale and Wood Green. The latter is a very small licence, and has not been used since 1971.

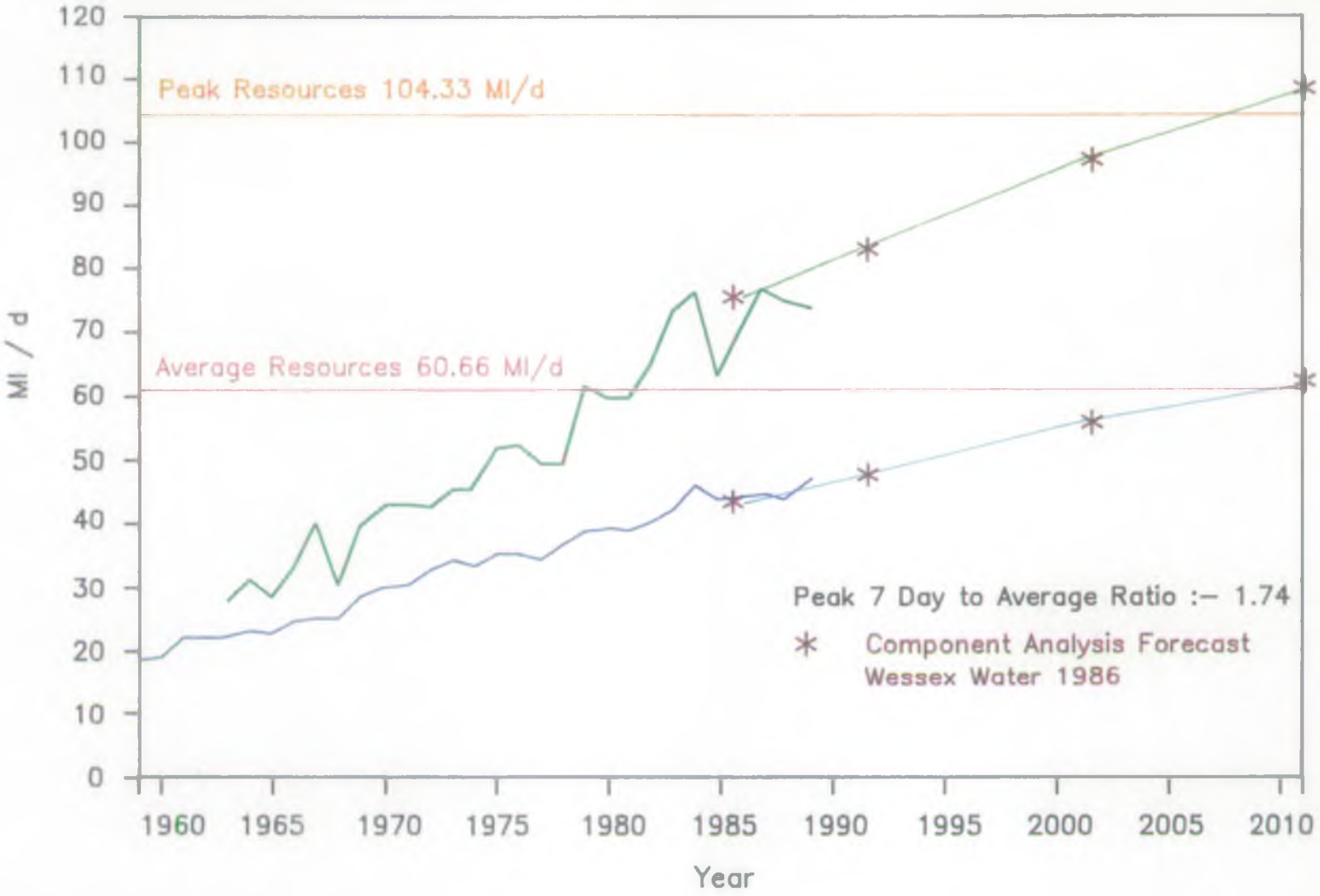
The West Hampshire Water Company also holds one licence for groundwater abstraction at Ampress near Lymington. This lies within the NRA Southern Region. The Ampress licence provides 2.74 Ml/d of the annual resources and 3.55 Ml/d of the peak resources. Before the commissioning of Blashford Lakes the total resources available to the company for potable supply were 60.66 Ml/d under average conditions. For short-term Summer demands in a 1 in 50 year drought they were 89.33 Ml/d.

With the implementation of Phase 1 of the Blashford Lakes the Company is now understood to have the water resources necessary to meet the demands until the year 2006. Beyond this date its interests in new source development may be determined by rationalisation of its connections with Bournemouth District Water Company. There may well remain however, the need for close association with Wessex Water Plc in further developments of the Blashford Lakes.

The peak 7 day to average demand is in the ratio of 1.74. The Company state that this exceptionally high ratio is due to 'Irrigation', including garden watering and cite examples during 1989 when the demand decreased by one third when rain occurred.

NRA – Wessex Region

West Hampshire Water Company – Consumption & Resources



Average Daily Consumption — Forecast Average Daily Consumption — Average Resources

Peak 7 Day Consumption — Forecast Peak 7 Day Consumption — Peak Resources

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Figure 4.5

5 The Blashford Lakes Scheme

The recently commissioned Phase 1 of the Blashford Lakes Scheme provides a source of water for both Wessex Water Plc and the West Hampshire Water Company. Future requirements of both of these undertakings may be closely linked to progress with further Phases of this development. It is the purpose of this section to explain the scheme and how it should operate to benefit both companies.

The Blashford Lakes are formed from worked out gravel pits to the north of Ringwood in the River Avon valley. They lie within the area of supply of the West Hampshire Water Company. The pits have been deepened, and a new treatment works constructed.

Wessex Water Plc hold two licences relating to Blashford Lakes: one for abstraction from the River Avon to the Lakes; the other for abstraction from the Lakes themselves. The river abstraction licence is linked to a Licence of Right held by the West Hampshire Water Company for abstraction from the River Avon downstream at Knapp Mill. The total abstracted at the Blashford river intake and at the West Hampshire site at Knapp Mill must not exceed the daily licenced quantity at Knapp Mill. Thus there is an interdependence between the undertakings: for source water and treated water.

The treatment works will be operated by Wessex Water Plc and they will pump water through a new 800 mm diameter trunk main to Ashley Heath. From there the water is split into two 600 mm diameter mains, one for the West Hampshire Water Company and the other for Wessex Water Plc.

The assessed yield of the Scheme is 35 Ml/d throughout a 1 in 50 year drought. Of this, 20 Ml/d will be utilised by Wessex Water Plc, and 15 Ml/d by West Hampshire Water Company.

Wessex Water Plc consider that the Blashford Lakes Scheme has increased their effective yield under summer conditions by 20 Ml/d, but will not affect the effective yield available to meet average demands. They, therefore, intend to use the Blashford Lakes Scheme as a peak lopping scheme to assist in meeting the summer peaks. Blashford water will be used in the South East of the Wessex area of supply, permitting the displacement of water from other sources, and allowing these to augment supplies elsewhere.

The West Hampshire Water Company has constructed a new pipeline to convey Blashford water to Christchurch, and intends to use the water in the following circumstances:

i) in the Spring and Autumn when the filters at the Knapp Mill treatment works become clogged due to the respective seasonal growths in diatoms and sediment load;

ii) for peak lopping to meet the maximum demand during the summer.

The supply to West Hampshire is effectively a bulk supply from Wessex Water Plc, although the terms are favourable in recognition of the contribution made by West Hampshire Water Company to the construction costs of the Blashford Lakes Scheme. In view of the importance of the concept to both undertakings joint participation might continue in future phases to expand the storage.

6. DISCUSSION AND CONCLUSIONS

6.1 It is the duty of supply undertakings under Section 37 of the Water Act 1989 to "develop and maintain an efficient and economic system of water supply" and "to ensure that all such arrangements have been made for providing supplies of water ..... as are necessary". At the same time the NRA is required under Section 125 of the Act to take such action as is necessary or expedient for the purpose of "securing the proper use of water resources". These separate duties will not always be blessed by a coincident view by the supply undertaking and the NRA of how best they will be served. No better reason is needed for the early establishment of a clear understanding of the potential difficulties in meeting the evidently increasing consumption of water in the NRA Wessex Region.

6.2 At present all water undertakings use different methods of producing consumption forecasts. They also utilise different techniques for assessing the value of their sources in respect of water yields. These are aspects of strategic planning that will require closer consistency in the future when the NRA would expect common techniques to be established after consultation with the supply undertakings. Such techniques would be based on sound 'component analysis' and could reasonably be expected to demonstrate the detail of water distribution operations down to the smallest unit area of water supply management relevant to the need to develop water sources.

6.3 Because of the complexity of the water distribution system over such a large area it is acknowledged that the NRA is not in position to provide a comprehensive analysis which recognises all localised difficulties of delivering water from source to user. This is a job for the supply undertaking. From the broad overview of the water resources strategy the NRA would draw conclusions relating to the general sufficiency of resource developments but would expect the undertakings to highlight the need for new source developments where deficiencies could not otherwise reasonably be met be redeploying surplus resources from elsewhere. Given the resource development policies of its predecessor Authority and its conviction in the principle of developing water near the mouths of rivers, it would need exceptional circumstances to persuade the NRA that a high level of investment in waste detection and improvement of distribution systems should not be the major route to local improvements.

6.4 In the Bournemouth and District Water Company area, licensed resources are adequate to meet average daily demands until well into the next century. The need there is for additional treatment and eventually storage to satisfy the extremely high peak demands. It would be expected that the Company pursue these necessary measures with vigour or alternatively seek to adjust its demand pattern to preclude the need for further Abstraction Licences within the foreseeable future.

6.5 The Bristol Water Company is in need of a new source of water before the turn of the century and has two primary options: an increase in abstraction from the Gloucester and Sharpness Canal or a new intake on the River Avon near Bath to support storage in Chew Valley Lake.

Licensing of the former is a matter for the NRA Severn Trent Region but the general concept of the latter is one which would receive the support of NRA Wessex Region subject to strict safeguards on the River Avon.

6.6 Demands on the Cholderton and District Water Company are small but this should not diminish proper care to conserve against waste. Development of the modest additional resource, required towards the end of the century to sustain average daily demands, can logically only be from groundwater. In this respect the protection of the quality of source water is of particular importance.

6.7 The very size of Wessex Water Plc area of supply makes it imperative that water resource developments are accompanied by a well integrated network of distribution pipelines to eliminate a multiplicity of new sources. Much has been achieved in this direction over the past two decades and in regional terms the Company has sufficient resources to meet forecast demands until the year 2007, but only if authorised resources can be successfully converted to effective use through the provision of appropriate plant.

To meet forecast peak demands there is a need to bridge the gap between 'available' and 'usable' resources if there is to be no shortfall to the 1995 demands. This will be essential during a period when there will be a presumption by the NRA against significant new licences for groundwater in already sensitive river catchments.

For the longer term there is seen to be an urgency in securing arrangements for the successional phases of Blashford Lakes. This is highlighted by the recent upward departure of actual consumption data from earlier forecasts. Given the long period normally required for the planning and construction of new source works it is most important that the next major source for the Company is clearly identified in time and in place.

6.8 West Hampshire Water Company has an exceptionally high peak to average demand ratio (1.74:1). Unless measures can be taken to adjust this then capacity must be found to meet the expected peak consumption by the year 2006. The Company may envisage a further sharing arrangement with Wessex Water in developments of Blashford Lakes to accommodate peak consumption on the forecast scale. The NRA would encourage joint participations of this nature and seek to ensure in its regulatory role that no one Company is unduly disadvantaged by a pre-emptive Licence application by another.

6.9 The presentation in this document of values for 'average' or 'peak' resources is not an acknowledgement that these quantities are immutable. Quite apart from the natural or incidental damage that can occur to water sources there remains the possibility that the NRA may be obliged at any time to make proposals to reduce quantities authorised by certain existing abstraction licences. Proposals of this nature would only be contemplated as a measure to redress clear impairment to the overall balance of water interests. They would also need to be accompanied by plans for replacement public water supplies where necessary. Future strategic planning may need to recognise the vulnerability of existing sources to diminished output.

REFERENCES

1. POPULATION TRENDS 58, Winter 1989; Office of Population Censuses and Surveys.

2. STRATEGY FOR WATER RESOURCES AND SUPPLY, AND FOR SEWAGE TREATMENT AND DISPOSAL; A supplement to the 1985 Wessex Plan, Wessex Water Authority, March 1985.

3. REVIEW OF CONSUMPTION FORECASTS FOR POTABLE WATER SUPPLY 1986-2011; Wessex Water Authority, June 1987.

4 LETTERS FROM EACH OF THE FIVE WATER UNDERTAKINGS, in response to an invitation from the NRA to comment on the report; letters dated July and August 1990, under file ref CP155/2