

**REVIEW OF PUBLIC WATER
SUPPLY YIELDS
Supplementary Report No 2
April 1994**

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Water Resources Development Strategy
Review of Public Water Supply Yields - Supplementary Report No 2
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REVIEW OF PUBLIC WATER SUPPLY YIELDS

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REFERENCES

INTRODUCTION

This report is the second in a series of nine supplementary reports which provide supporting information for the National Rivers Authority Water Resources Development Strategy document:

"An Environmentally Sustainable Water Resources Development Strategy for England and Wales".

The other reports in the series are as follows:

- 1 Methodology and Assumptions for Demand Scenarios;
- 3 Marginal Demands;
- 4 'Other' Options;
- 5 Hydrological Modelling;
- 6 Resource Scheme Costings;
- 7 RESPLAN Modelling;
- 8 Comparative Environmental Appraisal of Strategic Options;
- 9 National Strategy Overview

This report describes the methodology and results of the assessment of existing and future public water supply (PWS) reliable source yields, carried out by the NRA regions.

The ten NRA regions were asked to assess on a common basis:

- estimated yields of public water supply sources;
- bulk transfers of water across NRA regional boundaries;
- possible cutbacks in source yields due to environmental constraints; and
- potential future regional resource development schemes

The data were assembled by the regions in association with the water companies, and have been reviewed and collated by Halcrow; In so doing every effort has been made to ensure, through communications with the regions, that they are reported in a consistent manner with minimal anomalies.

The common approach specified for data collection by the regions is described in Section 2 of this report, including definitions of source yield and water transfer. Section 2 also describes the data provided and the methods adopted by Halcrow in reviewing the information.

The remaining Sections, one for each NRA region, detail any variations in approach adopted and present the data supplied in common format tables. Each regional section also contains descriptions of possible environmental cutbacks, any inter-regional transfers, an assessment of potential future regional resource schemes and a projection of available future resources taking all these factors into account.

2 APPROACH

2.1 Definitions

2.1.1 Definition of Yield

The Problem Definition Study Specification⁽³⁾ (PDSS) details the method for assessment of the yield of PWS sources for this study, whilst highlighting the need for more research on the subject.

Appendix 2 of the PDSS specifies that the estimated yield should be the average rate of supply which can be maintained from a source, or sources, in a 1 in 50 year drought or historic drought of similar severity. It has been assumed that a critical drought duration for each source type has been used for yield assessment.

The yields for different source types are further defined in the PDSS as follows:

- impounded storage - yield is the available output constrained by the licence conditions, except where the storage capacity is already installed and the upward variation of a licence to utilise the whole yield of the reservoir could not reasonably be withheld. In such cases the full yield of the source should be quoted unconstrained by the licence limit;
- groundwater sources - the yield quoted should be the lesser of the licence entitlement or the average rate of supply which could be met from the installed well field during the design drought conditions;
- direct river intakes or intakes and pumped storage reservoirs - the quoted yield should be constrained by the present licence conditions.

Yield definition is the largest area for possible discrepancies between the NRA regions. It is apparent that many of the yield estimates have not been assessed according to the PDSS. In many cases, particularly for smaller sources, the NRA regions do not have a clear picture of how the yield figures supplied to them by water companies have been derived. In most cases it has been assumed that they are based on a 1 in 50 year drought event. For example, Thames region's figures have generally been calculated on a target level of service method, whilst South West region's figures are peak four week period reliable yields. Neither of these approaches is in accordance with the PDSS.

The regions were also asked to supply, where relevant, information on such aspects as operational yield constraints, environmental constraints, and water quality problems etc. Cutbacks in yield due to alleviation of low flows (ALF) and water quality (WQ) considerations are included separately.

The yield summaries include all water company owned sources which are used to supply treated water for public supply and sources used to supply non-potable water to industrial users.

Resource accounting for a particular NRA region has been carried out according to the water company supply boundaries within that NRA region. Table 2.1 shows which water companies are under each NRA region's jurisdiction. The existing resource yield of a particular NRA Region is calculated by the summation of all resources licensed by that NRA Region to water companies under its jurisdiction, plus any imports, minus any exports.

2.1.2 Imports and Exports

Imports and exports are defined as:

Imports: An import is a water resource used by a water company which is not under the jurisdiction of the NRA region which licenses the resource.

Exports: Conversely, an export is a water resource licensed by a particular NRA Region but which is used by a water company not under that NRA's jurisdiction.

The application of this rule is illustrated by the examples below:

a) Derwent Valley Reservoirs

These reservoirs are owned and operated by Severn Trent plc which is under the jurisdiction of NRA Severn Trent. However, 40 MI/d of the yield of this resource is supplied (from Ladybower) to Yorkshire Water plc which uses the water to meet demands in Sheffield. Yorkshire Water plc is under the jurisdiction of NRA Yorkshire region. Therefore NRA Yorkshire's return includes this 40 MI/d as an import from Severn Trent region and Severn Trent include it as a 40 MI/d export to Yorkshire.

b) Doncaster Boreholes

These sourceworks are owned and operated by Yorkshire Water plc which is under the jurisdiction of NRA Yorkshire, although it is situated in, and licensed by NRA Severn Trent Region. The boreholes' yield is therefore included in NRA Yorkshire Region's return as an import, and in NRA Severn Trent Region's return as an export.

c) **Ogston Reservoir**

This reservoir is owned by Severn Trent plc and situated in and licensed by NRA Severn Trent Region. Some of the water from this source is supplied by Severn Trent plc to consumers in Chesterfield, which is actually within the NRA Yorkshire Region. The yield of this source is not included as a transfer; there is a transfer across an NRA boundary, but it does not cross a boundary between water companies falling under the jurisdiction of different NRA regions and is therefore not a transfer as defined.

2.2 Data Provided

Standard proformas were issued as part of the Project Definition Study and completed by the regions, providing data on existing source yields and potential future schemes. Possible cutbacks in yields due to alleviation of low flow (ALF) measures were collated separately and updated following discussions with each region. Other possible cutbacks, for example due to water quality problems, were estimated by each region where relevant.

The yield data were cross-checked with information from other sources including:

- Water Resources Planning - Strategic Options, December 1991;
- individual Regional Water Resource Strategies;
- "Section 143 Report", March 1991

Generally the degree of detail given by each region varied considerably, particularly with regard to the degree of aggregation of sources.

2.3 Method of Review

2.3.1 General

This report draws together the data provided by the regions in a consistent way, to provide information for the present water resources development strategy and as a reference document for the future.

Information on source yields were provided by each region according to water company internal records and methods of calculating yields. Variation in the presentation and consistency of the data may partially be explained by the differing source types in the regions. For instance regions in the south east tend to rely more heavily on groundwater sources and hence have large numbers of smaller borehole sources which, in many cases, have been aggregated. Regions in the north and west tend to depend more on surface water sources, which are often operated in more complex river regulation systems.

Regions also vary with regard to the amount of transfer activity. A region such as Severn Trent has large transfers of resources, acting as a 'hub' for transfers between regions. Others such as Northumbria and South West are relatively self sufficient.

The number and detail of possible future schemes also varies between regions, being dependent upon forecast demand and existing resources in the region. In regions such as the North West where no demand deficit is generally forecast in the planning horizon, there has been relatively little investigation into potential future resources.

The method used to review the data is outlined below.

2.3.2 Data Consistency

The consistency of the data provided was assessed by three means.

- i) comparison of the method actually used to calculate the yield figures with the method laid down in the problem definition study specification;
- ii) comparison of the data with those given in earlier regional water resource reports;
- iii) checking transfer information by cross-referencing with data supplied by neighbouring regions.

Specific queries and comments were produced for each region and comparison tables assembled which highlighted any inconsistencies in the data. The comments were sent to the regions so that checks could be made and anomalies resolved.

This was achieved through direct contact between Halcrow and NRA. The process for arriving at the best estimate of yield was often iterative, with several passes of the data required before consistent figures could be adopted.

The regions were commonly asked:

- if the methodology for calculating the source yields conformed to the specification;
- if there were any cases of yields being constrained by operational considerations (such as pump, pipeline or treatment works size) rather than the hydrological, hydrogeological or licence constraints;
- what the reasons were for any differences in transfer figures between the regions;

- if the ALF figures given by NRA HQ were reasonable for the region concerned;
- if there were any cutbacks in yield anticipated in the foreseeable future due to environmental or water quality concerns (eg ALF schemes or nitrate pollution of groundwater);
- the status of each potential future scheme on a grading of 1 to 4, where

Status 1 = Possible future development

Status 2 = Programmed for future development

Status 3 = Currently under investigation/development

Status 4 = Licence determination pending

The additional data provided by the above exercise have been incorporated into the regional tables.

2.3.3 Evaluation of Potential Future Schemes

In order to determine the potential future yields available within a region, ideally the feasibility of potential resource development options needs to be assessed. To classify the schemes solely in terms of their status would be over simplistic, conversely to try to assess the schemes on an individual basis is beyond the scope of the present study. A compromise methodology has therefore been devised.

It is suggested that potential future schemes are divided into classes A to D, based upon the type, size and status of development, with each class being associated with a date by which the schemes in that class are forecast to have been developed. The development dates chosen are: 2001, 2011 and 2021. The development classes are as follows:

Class	Description	Development Date
A	Conjunctive use schemes, operational improvements and control rule revisions	2001
B	Local schemes and groundwater wellfields below 20 MI/d. Partially developed schemes	2001
C	Larger conventional schemes whose development status is given as either 3/4	2011
D	Larger conventional schemes whose development status is given as either 1/2	2021

The following additional conventions have been applied in assessing potential future developments:

- where the NRA has expressed particular concern over a scheme's promotability it has been discounted;
- the available yields in 2021 have been calculated with and without the addition of Class D schemes, where relevant, in order to reflect their uncertainty.

There is, of course, uncertainty with the development of all classes of schemes and therefore the resulting calculated available resources should be taken as the high forecast.

The future available resources presented in each regional section have been calculated by subtracting any environmental cut-backs, which have been assumed to be fully implemented by 2001, from the existing source yield and then adding any potential future schemes in each class for each development date.

Transfers are not included independently in the calculations since they have already been taken into account by the regions in their assessments of existing source yields.

Table 2.1

WATER COMPANIES LISTED UNDER NRA REGION JURISDICTION

ANGLIAN REGION	SOUTH WEST REGION
Anglian Water Services Ltd	South West Water Services Ltd
Essex Water Company	
Cambridge Water Company	THAMES REGION
Tendring Hundred Waterworks Company	Thames Water Utilities Ltd
Suffolk Water Company	Three Valleys Water Services Plc
	North Surrey Water Company
NORTHUMBRIA REGION	East Surrey Water Plc
Northumbrian Water Ltd	Mid Southern Water Company
North East Water	Sutton District Water Plc
Hartlepoons Water Company	
NORTH WEST REGION	WELSH REGION
North West Water Ltd	Dwr Cymru/Welsh Water Plc
	Wrexham & East Denbighshire Water Company
	Chester Waterworks Company
SEVERN TRENT REGION	
Severn Trent Plc	WESSEX REGION
South Staffordshire Water Company	Wessex Water Plc
East Worcestershire Waterworks Company	Bournemouth & District Water Company
	Bristol Waterworks Company
SOUTHERN REGION	Cholderton & District Water Company
Southern Water Services Ltd	West Hampshire Water Company
Portsmouth Water Plc	
South East Water	YORKSHIRE REGION
Mid Kent Water Company	Yorkshire Water Services Ltd
Folkestone & Dover Water Services	York Waterworks Plc

3 ANGLIAN REGION

3.1 Existing Source Yields

The existing source yields presented in Table 3.1 have been taken from NRA Anglian region's draft Water Resources Strategy report. Full details of individual sources however could not be included because of reasons of commercial confidentiality. The total source yield in the Anglian region is calculated to be 2230 MI/d.

3.2 Transfers

Anglian region is a net importer of water, from the Thames and Severn Trent regions (see Table 3.2). If the increase in the export from Grafham to the Three Valleys Water Company in NRA Thames region occurs in 2001 as planned, however, Anglian's net import would be reduced from about 90 MI/d to about 50 MI/d.

3.3 Possible Cutbacks in Yields

Anglian region are currently researching the costs and benefits of restoring artificially reduced flows, as are other NRA regions, and nationally the NRA have been investigating methods to assess objectively low flow problems. These investigations are likely to take some time. NRA Anglian region have indicated that they do not currently feel that it is possible, therefore, to determine what low flow alleviation schemes would be worthwhile, or what they would involve.

3.4 Potential Future Resource Developments

Three regional resource developments have been identified with a potential yield of 76 MI/d (see Table 3.3).

Increased abstractions from the chalk in Suffolk and East Anglian are estimated to be worth for local use an additional 20 MI/d each. The River Trent at Torksey is estimated to be worth 36 MI/d for supply to Lincolnshire. All three schemes if required can be commissioned by 2001.

In calculating the future resources in the region, Anglian Water Services Ltd have anticipated an additional 108 MI/d being available from increased indirect effluent reuse. This resource would materialise from increased water consumption and subsequent effluent flow through the treatment works and river intakes. It has been estimated that indirect reuse will increase at the rate of 18 MI/d every 5 years, over the thirty year planning period.

3.5 Projected Available Resources

Available regional resources are shown in table 3.4 to rise from a present level of 2230 MI/d to 2378 MI/d by 2011 and to 2414 MI/d by 2021.

A rise in available resources of 112 MI/d between 1993 and 2001 is forecast with development of the local groundwater schemes in East Anglia and Suffolk (40 MI/d) the river Trent abstraction (36 MI/d) and an increase in effluent reuse. Further rises in resources up to 108 MI/d by 2021 are due to increased effluent reuse.

The Fenland reservoir, Great Bradley reservoir, and Chelmsford effluent reuse are strategic resources developments and are not included in the above forecasts.

4 NORTHUMBRIA REGION

4.1 Existing Source Yields

The total public water supply yield in the Northumbria region is estimated to be 2050 MI/d, which includes an unallocated yield from Kielder of 525 MI/d. The individual source yields given in Table 4.1 are based on yield assessments undertaken by the water companies in 1987/88. The NRA have subtracted 25 MI/d from the 1987/88 assessment to take account of the recent drought event.

4.2 Transfers

There are at present no exports from NRA Northumbria to other regions, but there is an import of 5 MI/d from Scaling reservoir in Yorkshire region (see Table 4.2).

4.3 Possible Cutbacks in Yields

No cutbacks in existing source yields have been identified, at present, for the NRA Northumbria region.

4.4 Potential Future Schemes

The proposed 8 MI/d development of the Magnesian Limestone aquifer south east of Durham by Hartlepoons Water Company is the only identified future scheme. The unallocated Kielder yield is large enough to ensure the region remains in surplus beyond the forecast horizon of 2021.

4.5 Projected Available Resources

Only a minor change in existing resources is forecast within the planning horizon (see Table 4.4). The magnesium limestone groundwater development has been taken to be a Class B scheme and the increased resources are calculated to rise to 2058 MI/d by 2001 and beyond.

5 NORTH WEST REGION

5.1 Existing Source Yields

The yields shown in Table 5.1 are available supply values, since in many cases the hydrological yields are not fully available due to various operational constraints. Where relevant the hydrological yield is noted in the comments column. These yields have been derived from the historic record, or based on probability analysis with a reliability of 1% or 2%.

The total existing reliable yield as agreed with North West Water plc is given as 2820 MI/d and the future maximum yield from existing sources is estimated by the NRA as 3001 MI/d.

5.2 Transfers

NRA North West region imports considerable volumes of water from both the NRA Welsh and NRA Severn Trent regions. Severn Trent supplies about 220 MI/d from Lake Vyrnwy and Welsh supplies 685 MI/d from the River Dee, the latter including 80 MI/d for non-potable industrial use. There are a few other minor transfers, both into and out of the region, see Table 5.2. Overall NRA North West is a net importer of 888 MI/d.

5.3 Possible Cutbacks in Yields

In the NRA North West region a cutback of 20 MI/d has been identified with regard to low flow problems in the River Lowther. The solution involves varying the compensation conditions from Haweswater. Agreement has been reached with North West Water and this scheme is now in place. A further cutback is likely with regard to the Lancashire Conjunctive Use Scheme although full details are not available. An overall allowance of 50 MI/d has therefore been made by the region for cutbacks due to environmental constraints.

5.4 Potential Future Schemes

Resources in the North West region are plentiful compared with regions in the south-east and regional supply deficits are not envisaged within the study forecast horizon. The only area where there is cause for concern is West Cumbria, which is isolated from the major supply systems. The undertaker has begun to investigate development options for the area, but as yet no solution has been discussed with the NRA.

Otherwise there has been no need for investigations into potential future schemes. However, following the proposal to reallocate Vyrnwy resources from the North West to the Severn Trent NRA region, some initial investigations have been carried out. North West Water plc and North West NRA have identified the following potential additions to current available supplies:

- River Dee involving
 - a) additional works to enable the full licensed entitlement to be taken up
 - b) enlargement of River Dee regulating reservoirs
- improved transmission from Lancashire conjunctive Use Scheme (LCUS) to enable hydrological yield to be fully utilised.
- pumped augmentation of Rivington reservoir from the river Ribble. Initial modelling studies indicate that the scheme yield is likely to be below 50 MI/d. There may be considerable opposition to this scheme on fishery grounds.

Of the aforementioned schemes only the pumped augmentation of Rivington reservoir is a new North West region resource development.

5.5 Projected Available Resources

The West Cumbria source, is estimated to have a yield of 10 MI/d which is assumed to be available in 2001.

In the rest of the region no developments are anticipated, unless Vyrnwy is reallocated. Projected available resources will therefore fall from 2819 in 1993 to 2779 MI/d in 2001 due to environmental cut-backs associated with the implementation of low flows. Studies into the LCUS and Dee schemes are at the preliminary stages. The estimated yields are:

Dee improvements 74 MI/d
 LCUS improvement 80 MI/d
 Ribble/Rivington up to 40 MI/d

If Vyrnwy were to be reallocated, one or more of the schemes above would need to be developed to maintain resources in the North-West.

6 SEVERN TRENT REGION

6.1 Existing Source Yields

The total resources in the region, including imports are 2620 MI/d. The yields given in Table 6.1 are either the reliable source outputs during drought years or a calculated hydrological yields. The table does not include source licence numbers and some source yields may be limited solely by operational constraints.

6.2 Transfers

Severn Trent region has the greatest number of water transfers both into and out of the region (see Table 6.2) Despite being the recipient of a considerable transfer of water from the Elan Valley reservoirs in Welsh region (327 MI/d), Severn Trent region as a whole is a net exporter of 285 MI/d, transferring 190 MI/d to Wessex region via the Gloucester/Sharpness Canal and about 210 MI/d to North West region from Lake Vyrnwy. There are also substantial exports to Anglian and Yorkshire regions.

6.3 Possible Cutbacks in Yields

An overall yield cutback of 65 MI/d has been identified as the result of possible solutions to low flow problems throughout the Severn Trent NRA region. There are three locations, Rufford Lake, River Warfe and Dover Beck, where substantial cutbacks are anticipated.

At Rufford Lake a possible solution is variation and revocation of two PWS licences which would result in a yield cutback of 15 MI/d. Redistribution or revocation of licences is also a possible solution to the River Worfe low flow problem. This would result in a yield cutback of 12 MI/d. Compensation for this cutback would be provided by groundwater developments in East Shropshire (see Table 6.2).

A further 13 MI/d cutback in yield will result from the solution to the Dover Beck low flow problem, which involves a phased reduction in PWS licences. This has been agreed with the water undertaker and is currently in hand.

In addition to yield cutbacks associated with low flow alleviation measures, Severn Trent Water plan to decommission, in phases a number of high nitrate sources. Although these closures would, in theory, lead to a cutback of 110 MI/d in existing yields this is unlikely to be the case in practice since, in most cases new schemes have been proposed with the objective of replacing such sources, see table 6.3.

The total cut-backs in region by 2021 are estimated to be 175 MI/d.

6.4 Potential Future Schemes

The total planned regional developments in each of Severn Trent Water's supply areas and South Staffs Water Company are given in Table 6.3. The developments are worth a total of 141 MI/d, of which 78 MI/d is supported by developments of the Shropshire groundwater scheme.

The Shropshire groundwater scheme and Carsington/Trent conjunctive use have been identified as strategic resource developments and are dealt with elsewhere.

6.5 Projected Available Resources

The projected available resources in the Severn Trent region are shown in Table 6.4 to rise from 2620 MI/d in 1993 to 2671 MI/d in 2001; following environmental and operational cutbacks of 65 MI/d and 25 MI/d respectively, and the development of 141 MI/d of new resources. Further operational cutbacks will reduce resources to 2629 MI/d in 2011 and 2586 MI/d in 2021.

7 SOUTHERN REGION

7.1 Existing Source Yields

There are 5 water companies under the jurisdiction of Southern NRA region with a total source yield of 1517 MI/d (see Table 7.1). The NRA assume that the yields given are 1 in 50 year drought reliable yields; however, this has yet to be confirmed with the water companies. Not all the yields for Southern Water Services plc have been agreed.

7.2 Transfers

NRA Southern region exports 63 MI/d to water companies in the NRA Thames region, as shown in Table 7.2, and receives no imports from other regions.

7.3 Possible Cutbacks in Yields

A number of sources within the NRA Southern region have been identified where licence revocation or variation could be a possible solution to low flow problems. These are on the Little Stour (10 MI/d), Hamble (5 MI/d), Wallop Brook (5 MI/d) and Darent (30 MI/d).

A total yield cutback of 50 MI/d could result from the proposed solutions to these problems. However, the major cutback 30 MI/d on the River Darent, would actually affect Thames region rather than Southern, because the Darent source is operated by Thames Water Utilities.

7.4 Potential Future Scheme

The yield from ten of the eleven listed developments in Table 7.3 is estimated to be 225 MI/d - the yield for Hardham artificial recharge is unknown. Details of these schemes are to be found in the NRA's recently published resource strategy for the region. Two of the largest schemes, the Rivers Test and Itchen developments are groundwater augmentation schemes, which are being promoted by the NRA. The yield from these schemes would be used to support public water supply and private abstractions from those rivers.

7.5 Projected Available Resources

In the Southern NRA region the available resources are projected to rise from 1517 MI/d in 1993 to 1722 MI/d in 2021 (see Table 7.4). New surface water abstractions at Yalding, Crowhurst bridge and Testwood Lakes, a transmission link between the Rother-Medway, an enlargement of Darwell reservoir and local groundwater schemes are forecast to increase resources to 1588 MI/d in 2001, following environmental cut-backs of 20 MI/d. Detailed work has not yet begun on the remaining regional schemes, which have a total estimated yield of 134 MI/d and would if they went ahead increase the available resource to 1722 MI/d by 2021.

8 SOUTH WEST REGION

8.1 Existing Source Yields

The total source yield in the NRA South West region is 606 MI/d (see Table 8.1). The yields given in table 8.1 provided by South West Water Services Ltd are peak four week period drought reliable yields, and as such do not comply with the study specification.

8.2 Transfers

The only significant transfer from NRA South West region is an export of 32 MI/d to Wessex Water plc from Wimbleball reservoir (see Table 8.2). South West also export a small volume of water, 1.4 MI/d, to Wessex from Shepherd Shore.

8.3 Possible Cutbacks in Yields

NRA South West region are undertaking a number of low flow investigations, although none of the sites identified in the South West appear in the national "top 40" list of low flow problem sites.

About 6.4 MI/d of yield could be lost if the compensation release from Burrator reservoir were increased, however, it is likely that any loss in resources could be made up from elsewhere in the region. There are also some concerns over water quality in East Devon and some small groundwater sources have been shut down because of various quality problems.

Overall, however, NRA South West do not foresee any significant cutbacks in existing source yields.

8.4 Potential Future Schemes

There are presently three potential future schemes identified in the South West region worth a total of 110 MI/d, these are:

- Wimbleball Pumped Storage;
- Roadford Pumped Storage; and
- Colliford Pumped Storage

South West Water have applied for a licence for a Wimbleball pumped storage which would in total be worth approximately 40 MI/d; 30 MI/d to South West Water and 10 MI/d to Wessex Water. The proposals are currently being reviewed by the NRA.

The estimated yields of Roadford reservoir and Colliford pumped storage schemes are estimated to be 50 MI/d and 30 MI/d respectively. Detailed studies of these schemes have yet to be commenced, it has therefore been assumed that they will not be developed before 2021.

8.5 Projected Available Resources

The available resources in the South West NRA region are forecast to increase from the present level of 606 MI/d to 636 MI/d by 2001 and 716 MI/d by 2021.

Wimbleball pumped storage, which is presently under investigation, is assumed to be available by 2001 and Roadford and Colliford pumped storage schemes are assumed to be developed by 2021.

9 THAMES REGION

9.1 Existing Source Yields

The total source yield in the Thames region is 4337 MI/d as detailed in Table 9.1. The yields of the surface water sources have generally been calculated on a target level of service method. They have not, therefore, been calculated according to the problem definition study specification.

All yields have been agreed with the undertakers.

9.2 Transfers

NRA Thames region is a net importer of 105 MI/d of water from Anglian and Southern Regions.

Imports total 202 MI/d and include major transfers from Grafham reservoir (91 MI/d) Bough Beech reservoir (30 MI/d) and groundwater sources (77 MI/d) in the Anglian and Southern regions. Thames exports water to the Severn Trent, Wessex and Anglian regions; of the 96 MI/d exported, 91 MI/d is transferred to Anglian from Lee Valley reservoir and the London ring main.

Imports into Thames are forecast to rise by 45 MI/d by 2001 with the take up of the Grafham reservoir bulk transfer agreement Three Valleys Water Company has with Anglian Water Services.

9.3 Possible Cutbacks in Yields

A possible yield cutback of 67 MI/d has been identified by NRA Thames region of which 9 MI/d has already been subtracted from the existing yield for the River Pang. Other cutbacks being anticipated or considered are on the rivers Darent, Ver, Misbourne and Wey.

A planned cutback of 30 MI/d in relation to the River Darent affects Thames region, because although licensed by NRA Southern the yield is used by Thames Water Utilities.

A cutback of 12 MI/d is anticipated from a variation of the River Ver public water supply licence; the target date for implementation of this variation was April 1993. The preferred solution to the River Misbourne low flow problem involves a reduction of a total 16 MI/d in the licensed abstractions. Selection of the final solution is expected in 1993/94. A further cutback of up to 4 MI/d could result from measures currently being considered for alleviation of low flows in the River Wey.

9.4 Potential Future Schemes

The total yield of the potential regional schemes (not including the Severn to Thames transfer) listed in Table 9.3 is 305 MI/d. This level of investigation into potential future schemes reflects the large supply deficits forecast for the region in the medium to long term.

Development and investigation into the North London artificial recharge schemes have been encouraging and indicate that the scheme, when fully developed will produce a substantial yield gain. The South London scheme, which is presently under investigation, looks less promising. Also under investigation is the prospect of obtaining upto 30 MI/d of water as the need to control rising groundwater levels becomes evident.

An additional 45 MI/d will be available to Three Valleys Water Company through their agreement with Anglian Water to provide a total of 118 MI/d.

The NRA have suggested the yield of the various Thames-side groundwater developments is approximately 70 MI/d, though the stated water company valuation is higher.

There are several large resource schemes, such as a proposed new reservoir in South West Oxfordshire and effluent reuse schemes at Deephams & Mogden STW which have not been included in this yield assessment. These schemes are important enough to be classified as strategic options and have been dealt with elsewhere.

9.5 Projected Available Resources

The available resources in the Thames region as shown in Table 9.4 are forecast to increase from 4337 MI/d in 1993 to 4992 MI/d by 2011. All new listed developments are currently under investigation and have been classified as class C, except for the North London artificial recharge development and the increased supply from Grafham which have been classified as B schemes. The North London artificial recharge scheme is already partially developed and is forecast to be fully operational before 2001. The increased transfer from Grafham is also programmed for 2001.

10 WELSH REGION

10.1 Existing Source Yields

There are 280 public water supply licences in the Welsh region; details of 88% of these are given in Table 10.1. The remaining 12% is made up of small sources with outputs of less than 2 MI/d. The public supply yield of all sources is estimated to be 1633 MI/d.

The yields given in Table 10.1 are source reliable outputs. Most are based upon approximately a 1 in 50 year drought event, except for the River Dee which is a 1 in 100 year reliable output. It has been suggested that an extra 60 MI/d may be obtained from the Dee, if output was to be assessed on the basis of a 1 in 50 year return period drought rather than the 1 in 100 year period.

10.2 Transfers

NRA Welsh region exports the most water of all the NRA regions, as clearly shown in Table 10.2. The exact volumes of water transferred to the North West region from the River Dee and to the Severn Trent region from the Elan Valley reservoirs still need to be resolved. Broadly, however, about 360 MI/d is transferred to Severn Trent and about 750 MI/d to North West making NRA Welsh region a net exporter of about 1,045 MI/d.

10.3 Possible Cutbacks in Yields

A number of low flow problems have been identified in the Welsh NRA region, however, only limited details are available of possible cutbacks in existing source yields as a result of resolving these problems. A licence revocation of 1.7 MI/d is a possible solution to a low flow problem on the Afon Ciywedog, but no date has been set for this reduction.

Other cutbacks, totalling 122.9 MI/d, include for the future abandonment and decommissioning of existing sources and the reduction in licensed entitlements.

10.4 Potential Future Schemes

Future regional developments in the Welsh region are worth a total of 218 MI/d and include:

- local supply developments in central and north Wales, worth 50 MI/d;
- Improvements of the spillway structure on Llyn Celyn, a major regulating reservoir on the River Dee system, to provide an additional 25 MI/d; and

- minor developments on the River Dee, being investigated by Chester Waterworks Company and Wrexham water company worth 10 MI/d and 11 MI/d respectively.

The raising of the spillway at Llyn Brianne has been estimated to be worth an additional 127 MI/d. This water would be used to meet demand in South Wales by either regulation of the River Tywi or the River Wye.

The enlargement of Craig Goch and the conversion of Vrynwy reservoir from direct supply to river regulation have not been included in Table 10.3, since their size and location mean that they could have a strategic importance beyond the boundaries of NRA Welsh region.

10.5 Projected Available Resources

Except for Llyn Brianne, all potential future schemes identified in the Welsh region have been classified as local developments, and have been given a B classification. The available resources are forecast to fall to 1599 MI/d by 2001 from existing resource levels of 1633 MI/d, following the development of these schemes and the implementation of environmental and other cut-backs. If Llyn Brianne were to be developed, resources will recover in 2021 to a level of 1726 MI/d.

11 WESSEX REGION

11.1 Existing Source Yields

The total source yield in the Wessex Region is 1051 MI/d which includes transfers from NRA Severn Trent and South West regions. Full details of the individual source yields are given in Table 11.1.

Following discussions with the undertakers, the yields were calculated according to the study specification.

11.2 Transfers

Imports into the NRA Wessex region total 230 MI/d, principally from NRA Severn Trent region to Bristol Water plc via the Gloucester/Sharpness canal (190 MI/d) and from the Wimbleball reservoir (32 MI/d) in the NRA South West region to Wessex Water plc (see Table 11.2).

11.3 Possible Cutbacks in Yields

Possible reductions and variations in existing licences of 76 MI/d are likely to be sought following low flow alleviation investigations being carried out on the rivers Allen, Malmesbury Avon, Piddle and upper tributaries of the Hampshire Avon. However, of these reductions only 3.7 MI/d in the Piddle catchment is likely to be an absolute reduction. All other reductions can potentially be recovered through alternative resource development, but these may take several years to put into effect.

11.4 Potential Future Schemes

The total yield from the three potential future schemes listed in Table 11.3 is 66 MI/d.

A minor groundwater development worth 1 MI/d is proposed to meet future Cholderton Water Company demands. The estimated yield of 55 MI/d for the Bristol Avon assumes the river water is to be used to augment inflows to Chew Valley Lake. However, if alternatively the source is to be operated as an unsupported river abstraction it is likely to be worth only 30 MI/d. The Wimbleball Pumped Storage scheme is currently under investigation and is estimated to be worth 10 MI/d to Wessex (see Section 8.4)

Further transfers from the River Severn to Bristol Water via the Sharpness Canal will be dependent upon development of resources in either the River Severn or River Wye catchments. This topic is addressed elsewhere.

11.5 Projected Available Resources

The available resources in the region are forecast to rise from 1051 MI/d in 1993 to 1113 MI/d by 2011 with a 4 MI/d environmental cut-back (see Table 11.4). Cholderton groundwater development, estimated to yield 1 MI/d, is a local scheme which will be available by 2001.

Wimbleball pumped storage scheme is assumed to be available by 2001 and the River Avon abstraction ten years later, by 2011.

12 YORKSHIRE REGION

12.1 Existing Source Yields

The drought reliable yield in the Yorkshire region is estimated to be 1664 MI/d. The data given in Table 12.1 is derived from agreed summary of yields prepared by Yorkshire Water and reviewed by the NRA as part of the regional water resource strategy study.

12.2 Transfers

NRA Yorkshire region is a net importer 109 MI/d of water from neighbouring regions as shown in Table 12.2. Imports include 40 MI/d from Ladybower reservoir in the Severn Trent region and a further 83 MI/d currently obtained from the Doncaster Sherwood sandstone wellfield, also in Severn Trent region. The supply from the Doncaster wellfield, however, is planned to be reduced by 18 MI/d to 65 MI/d by 1994 (see Section 12.3 below).

12.3 Possible Cutbacks in Yields

A yield cutback of 18 MI/d is planned at the Doncaster wellfield in order to *reduce current over-abstraction* of the Sherwood sandstone. This reduction has been accounted for in the yield assessment in Table 12.1. At present no further cutbacks in existing source yields have been identified.

12.4 Potential Future Schemes

Yorkshire Water (YW) are also in the process of developing a water resource strategy for the next twenty five years and have identified numerous resource development options. Potential future schemes are shown in Table 12.3.

To meet short term demand deficits YW are investigating the possibility of increased conjunctive use of their river and groundwater sources. In addition to licence changes and operational improvements, the increase in resources which could be achieved in this way is estimated to be about 80 MI/d. Local scheme developments and development of groundwater in the Vale of Pickering and Vale of York could provide up to 55 MI/d. In the long term there are proposals to augment existing Washburn Valley reservoirs, make better use of water resources in the River Aire catchment and develop transfers from Kielder reservoir, however, these studies are only at the preliminary stages.

12.5 Projected Available Resources

The projected available resources in the Yorkshire region are shown in Table 12.3 to rise from an existing level of 1664 MI/d to 1941 MI/d by 2021.

The Class A schemes to be developed by 2001 include local groundwater developments, operational improvements and changes to existing licences on the river Ouse. These schemes are estimated to provide, taking into account environmental cut-backs 1746 MI/d of available resources by 2001. It should be noted that the yield estimated from these schemes has not been agreed with the undertakers.

Development of a York groundwater scheme (35 MI/d) by 2011 would increase resources to 1781 MI/d and development of the Washburn Valley, the River Aire and a Kielder transfer would supply an additional yield of 160 MI/d by 2021, giving total resources of 1941 MI/d.

REFERENCES

1. 'Demands and Resources of Water Undertakers in England and Wales' Preliminary Report under Section 143(2)(a) Water Act 1989, NRA, March 1991
2. 'Water Resource Planning - Strategic Options' Sir William Halcrow & Partners Ltd for NRA, Devenber 1991
3. 'National Water Resources Development Strategy - Problem Definition Study Specification' NRA.

Table 3.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Anglian							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
	<u>Lincs Chalk and Sandstone</u>				Anglian Water Services			
	Northern Chalk	110.00	GW	Y				
	Southern Chalk	7.94	GW	N			7.3 Agreed by undertaker	
	Spilsby Sandstone	31.03	GW	N			28.03 Agreed by undertaker	
	<u>Lincs Limestone</u>							
	Northern Limestone	19.51	GW	N			15.96 Agreed by undertaker	
	Central Limestone	18.45	GW	Y				
	Southern Limestone	80.10	GW	N			76.0 Agreed by undertaker	
	<u>Lincs Minor</u>							
	Lincs Minor	0.00	GW	Y				
	<u>Cambridgeshire Chalk</u>							
	Granta - Unit 5	0.00	GW	Y				
	Cambridge - Unit 6	0.00	GW	Y				
	Lodes - Unit 7	13.03	GW	Y				
	Lark - Unit 8	53.08	GW	Y				
	Little Ouse - Unit 9	26.57	GW	Y				
	Wissey - Unit 10	29.80	GW	N				
	Nar - Unit 11	22.76	GW	Y				
	Babingley/Gaywood - Unit 12	20.20	GW	Y				
	NW Norfolk Chalk - Unit 13 & 14	3.78	GW	Y				
Page Sub-Total =		436.25	*Source Type: GW = Groundwater; SW = Surface Water.					Page 1 of 10

Table 3.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Anglian							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
	<u>Lower Greensand</u> Leighton Buzzard - Unit GS1	9.34	GW	N	Anglian Water Services (Cont'd)		8.0 Agreed by undertaker	
	Sandy - Unit GS2	21.96	GW	Y				
	Cambridge - Unit GS3	4.55	GW	Y				
	Sandringham - Unit GS4	6.76	GW	Y				
	<u>Central Minor</u> Oolites/Gravels	1.50	GW	Y				
	<u>North Norfolk Chalk</u> Stiffkey - 34/03	6.99	GW	N			6.48 Agreed by undertaker	
	Glaven - 34/04	4.11	GW	Y				
	Mun - 34/05	5.08	GW	Y				
	<u>Bure Chalk</u> Bure - 34/06	8.61	GW	N			Development of Aylsham not included	
	Ant - 34/08	5.48	GW	Y			Includes Crag Source at Ludham - in hydraulic continuity with the Chalk	
	Bure/Ant - 34/09							
	<u>Wensum Chalk</u> Wensum - 34/11	10.31	GW	Y				
	Yare - 34/13	17.72	GW	Y				
	Tas - 34/14	9.63	GW	Y				
	Tidal Yare - 34/15a	19.18	GW	Y			Includes Sand and Gravel Source at Kirby Cane - in hydraulic continuity with the Chalk	
	Page Sub-Total =	131.22	*Source Type: GW = Groundwater; SW = Surface Water.					Page 2 of 10

Table 3.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Anglian							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
	<u>Waveney Chalk</u> Waveney - 34/16	8.82	GW	Y	Anglian Water Services (Cont'd)			
	Waveney - 34/18	2.00	GW	Y				
	<u>Deben Chalk</u> Deben - 35/06	41.80	GW	Y			Sources within 35/6 to 35/10 are linked by aggregate	
	Fynn/Lark - 35/07							
	<u>Gipping Chalk</u> Gipping - 35/08							
	Belstead Brook - 35/09							
	Felixstowe Peninsular - 35/10a							
	<u>Stour Chalk</u> Upper Stour - 36/11	10.96	GW	Y				
	Lower Stour - 36/15	34.37	GW	Y				
	Brett - 36/17	8.80	GW	Y				
	<u>Mid Essex Chalk</u> Colne - 37/21	7.40	GW	Y				
	Colne - 37/23	4.11	GW	Y				
	Blackwater/Chelmer - 37/31	19.47	GW	Y				
	Page Sub-Total =	137.73	*Source Type: GW = Groundwater; SW = Surface Water.					Page 3 of 10

Table 3.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Anglian							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
	Saltersford	20.0	SW	N	Anglian Water Services (Cont'd)			
IMPORT	River Trent/Elsham WTW	85.0	SW	N			Import from NRA Severn Trent Region	
	Covenham	64.0	SW	N				
	Rutland	423.0 (532.0 see comments)	SW	N			Ruthamford system. A further 18 Ml/d of yield from Rutland is exported to NRA Severn Trent Region and a further 91 Ml/d yield from Grafham is exported to Thames Region (3 Valleys). 3 valleys have an entitlement to increase this import by 45 Ml/d to 136 Ml/d by 2001. This would produce a corresponding reduction in the yield of this system available to AWS. However, the overall yield of the system will rise over time (assuming that demands rise) due to increasing effluent returns	
	Pitsford							
	Grafham							
	Ravensthorpe/Hollowell	8.0	SW	N				
	Loke Road	0.0	SW	N				
	Marham	8.0	SW	N				
	Stoke Ferry	18.0	SW	Y				
	Foxcote	6.5	SW	N				
	Clapham	27.0	SW	N				
	Costessey/Heigham	46.0	SW	N				
	Alton	30.0	SW	N				
	Ardleigh	13.0	SW	N				
Page Sub-Total =		748.5	*Source Type: GW = Groundwater; SW = Surface Water.					Page 4 of 10

Table 3.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Anglian							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
IMPORTS	Bunter Sandstone	69.0	GW	Y	Anglian Water Services (Cont'd)		Imports from NRA Severn Trent Region	
	Elkesley							
	Everton							
	Grove							
	Ordsall Road							
	Lea Road							
	Newton on Trent							
	Scarle							
		WATER COMPANY TOTAL	1522.7					
Page Sub-Total =		69.0	*Source Type: GW = Groundwater; SW = Surface Water.					Page 5 of 10

Table 3.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Anglian							DATE: APRIL 1993	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
	Thameside Chalk Crouch/Thames - 37/44	0.0	GW	Y	Essex Water Company			
	Crouch/Thames - 37/56	9.06	GW	Y				
	Abberton, Hanningfield and Associated Sources	340.0	SW	Y				
IMPORT	Lee Valley Reservoir/London Ring Main (Chigwell)	91.0	SW	Y			Import from NRA Thames Region	
	WATER COMPANY TOTAL	440.06						

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Anglian							DATE: APRIL 1993	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
	<u>Cambridgeshire Chalk</u> Little Ouse - Unit 9	3.44	GW	Y	Suffolk Water Company			
	<u>Bure Chalk</u> Bure/Ant - 34/09	4.83	GW	Y				
	<u>Waveney Chalk</u> Dove 34/17	4.49	GW	Y				
	Waveney - 34/18							
	Tidal Waveney 34/19a	20.43	GW	Y				
	<u>Blyth/Aide Chalk</u> Blyth - 35/02a	5.71	GW	Y				
	Aide - 35/04a	4.23	GW	Y				
	<u>Suffolk Crag</u> Lothingland - 35/01	1.23	GW	Y				
	Yox & Minsmere - 35/03	4.47	GW	Y				
	Tidal Aide & Ore - 35/05	0.25	GW	Y				
	Shipmeadow	21.0	SW	Y				
	Belaugh & Horning	23.0	SW	Y				
	Lound	5.0	SW	Y				
	WATER COMPANY TOTAL	98.08						
	Page Sub-Total =	98.08	*Source Type: GW = Groundwater; SW = Surface Water.					Page 7 of 10

Table 3.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Anglian							DATE: APRIL 1993	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
	<u>Cambridgeshire Chalk</u> Rhee - Unit 3	24.44	GW	Y	Cambridge Water Company			
	Cam - Unit 4	15.23	GW	Y				
	Granta - Unit 5	16.23	GW	Y				
	Cambridge - Unit 6							
	Lodes - Unit 7	42.33	GW	Y				
	Little Ouse - Unit 9	23.34	GW	Y				
	<u>Lower Greensand</u> Cambridge - Unit GS3	3.49	GW	Y				
	<u>Central Minor</u> Oolites/Gravels	0.00	GW	Y				
	WATER COMPANY TOTAL	125.06						

Table 3.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Anglian							DATE: APRIL 1993	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
	<u>Stour Chalk</u> Brett - 36/17	28.50	GW	Y	Tendring Hundred Waterworks Company		Sources within Brett, Stratford/Flatford and Stour estuary catchments are linked by aggregate	
	Stratford/Flitford - 36/18							
	Stour Estuary - 36/19							
	<u>Tendring Gravels</u> Great Bentley (Tendring Peninsular - 37/25)	2.60	GW	Y			Emergency use only	
	Ardleigh	13.0	SW	Y				
	WATER COMPANY TOTAL	44.1						

Table 3.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Anglian							DATE: APRIL 1993	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
	WATER COMPANY TOTAL	1522.7			Anglian Water Services			
	WATER COMPANY TOTAL	440.06			Essex Water Company			
	WATER COMPANY TOTAL	98.08			Suffolk Water Company			
	WATER COMPANY TOTAL	125.06			Cambridge Water Company			
	WATER COMPANY TOTAL	44.10			Tendring Hundred Waterworks Company			

Table 3.2

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		INTER-REGIONAL TRANSFERS			NATIONAL RIVERS AUTHORITY
NRA REGION: Anglian					DATE: APRIL 1994
From (NRA region)	To (NRA region)	Source	Volume (MI/d)	Comment	
Anglian	Thames	Various chalk boreholes	-45		
Anglian	Thames	Grafham	-91	Programmed to increase to 136MI/d by 2001	
Anglian	Severn Trent	Rutland	-18		
Sub-Total			-154	Programmed to increase to -199 MI/d by 2001	
Severn Trent	Anglian	Bunter Sandstone	+ 70	Reducing to 68 in 2003	
Severn Trent	Anglian (via NRA transfer)	River Trent	+85		
Thames	Anglian	Lee Valley Reservoir/London Ring Main (Chigwell)	+91		
Sub-Total			+246		
TOTAL			+92	Programmed to decrease to +47 in 2001	
Page 1 of 1					

Table 3.3

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		POTENTIAL FUTURE REGIONAL DEVELOPMENTS				NATIONAL RIVERS AUTHORITY	
NRA REGION: Anglian						DATE: APRIL 1994	
Line No	Development Name	Source* Type	Yield (Ml/d)	Yield Est. Agreed with Undertaker (Y/N)	Comment	Status and Class	
1	Increased abstraction from Chalk (Suffolk)	GW	20	Y	Local supplies	2	B
2	Increased abstraction from Chalk (Anglian East)	GW	20	Y	Local supplies	2	B
3	Increased abstraction from R Trent	SW	36	Y		2	B
4	Indirect effluent reuse	SW	108	Y	Estimated increase in effluent through existing intakes, 18 Ml/d increase every 5 years	2	B
TOTAL			184	* Source Type: GW = Groundwater, SW = Surfacewater			Page 1 of 1

Table 3.4

Anglian Region				
Development Date	1993	2001	2011	2021
Existing Source Yield (MI/d)	2230	2230	2230	2230
Possible Yield Cutbacks (MI/d)	0	0	0	0
*Potential Future Schemes (MI/d)	0	112	148	184
TOTAL	2330	2342	2378	2414

Table 4.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Northumbria							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
	Magnesian Limestone	43.5	GW	N	Hartlepoons Water Company		Numerous Licences. Shared with North East Water and Northumbrian Water - 43.5 is the yield for Hartlepoons WC only	
	Minor sources	7.5		N				
	WATER COMPANY TOTAL	51.0						
						</		

Table 4.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Northumbria							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
1/23/3/2 1/23/1/3	River Tyne	182.0	SW	N	North East Water		Kielder Supported (284 Ml/d from Kielder)	
1/23/4/1	Derwent Reservoirs	53.5	SW	Y			Source shared with Northumbrian Water - 53.5 Ml/d each	
	Magnesian Limestone	43.5	GW	N			Numerous Licences. Shared with Northumbrian Water and Hartlepoons WC - 43.5 is the yield for North East Water only	
1/24/5/34	River Wear	45.0	SW	N			Kielder supported	
1/23/1/1	Catcleugh Reservoir	45.0	SW	N				
1/22/3/8 1/22/5/13	River Coquet	22.0	SW	N			Includes Fontburn. Source shared with Northumbrian Water - 22 is the yield for North East Water only	
1/24/1/34	Burnhope Reservoir	20.0	SW	N			Several reservoirs supported by Kielder (34 Ml/d). Source shared with Northumbrian Water - 20 is the yield for North East only	
1/23/1/1	Whittle Dene	27.0	SW	N			Whittle Dene + Colt Crag + Little Swinburn	
	Minor sources	46.0		N				
	WATER COMPANY TOTAL	484.0						
	Page Sub-Total =	484.0	*Source Type: GW = Groundwater; SW = Surface Water.					Page 2 of 4

Table 4.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Northumbria							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
1/25/2/103 1/25/2/109 1/5/4/136	River Tees	632.0	SW	Y	Northumbrian Water Ltd		Supported by Kielder (284 MI/d from Kielder)	
1/25/1/1	Teesdale Reservoirs	145.0	SW	Y			Direct supply (5 reservoirs)	
1/23/4/1	Derwent Reservoirs	53.5	SW	Y			Source shared with North East Water - 53.5 MI/d each	
	Magnesian Limestone	10.0	SW	N			Numerous licences. Sources shared with North East Water and Hartlepoons WC - 10.0 is the yield for Northumbrian only	
1/22/3/8 1/22/5/13	River Coquet	22.0	SW	N			Includes Fontburn. Source shared with North East Water - 22 is the yield for Northumbrian only	
1/24/1/34	Burnhope Reservoir	80.0	SW	N			Several reservoirs supported by Kielder (34 MI/d). Source shared with North East Water - 80 is the yield for Northumbrian only	
	Minor sources	47.5		N				
	WATER COMPANY TOTAL	990.0						
	Page Sub-Total =	990.0	*Source Type: GW = Groundwater; SW = Surface Water.					Page 3 of 4

Table 4.1 continued[illegible]

Table 4.2

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		INTER-REGIONAL TRANSFERS			NATIONAL RIVERS AUTHORITY	
NRA REGION: Northumbria					DATE: APRIL 1994	
From (NRA region)	To (NRA region)	Source	Volume (MI/d)	Comment		
Yorkshire	Northumbria	Scaling reservoir	+5			
Total			+5			
					Page 1 of 1	

Table 4.3

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		POTENTIAL FUTURE REGIONAL DEVELOPMENT				NATIONAL RIVERS AUTHORITY	
NRA REGION: Northumbria						DATE: APRIL 1994	
Line No	Development Name	Source* Type	Yield (M/d)	Yield Est. Agreed with Undertaker (Y/N)	Comment	Status and Class	
1	Magnesian Limestone SE Durham	GW	8	Y		3	B

Table 4.4

Northumbria Region				
Development Date	1993	2001	2011	2021
Existing Source Yield (MI/d)	2050	2050	2050	2050
Possible yield Cutbacks (MI/d)	0	0	0	0
Potential Future Schemes (MI/d)	0	+8	+8	+8
TOTAL	2050	2058	2058	2058

Table 5.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES						NATIONAL RIVERS AUTHORITY
NRA REGION: North West								DATE: APRIL 1994
Licence Number	Source Name/Location	Current Available Yield (Ml/d)	Future Maximum Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Comment	
NOTE: THE YIELDS QUOTED MAY, IN SOME CASES, ONLY BE ACHIEVABLE WITH APPROPRIATE CAPITAL INVESTMENT, FOR EXAMPLE, IN TREATMENT WORKS, AQUEDUCTS, PUMPING STATIONS ETC. SEE COMMENTS COLUMN								
IMPORT	River Dee	635.0	709.0	SW	Y	North West Water Ltd	Licensed import from NRA Welsh Region - includes abstractions at Heronbrige, Huntington and Hurleston via Llangollen Canal. Includes total of 80 Ml/d for non-potable industrial use 74 Ml/d of licensed volume currently unused	
2673705021	Windermere	690.0	700.0	SW	Y		Aqueduct capacity currently limits supplies to 690 Ml/d	
2775009011	Thirlmere							
2776004029	Ullswater							
2776005005	Haweswater/Thirlmere							
2776005011	Haweswater							
2671311004	Stocks Reservoir	180.0	260.0	SW&GW	Y		LCUS - complex conjunctive system with surface and groundwater sources. Reliable yield 260 Ml/d but only 180 Ml/d available at present due to distribution limitations. Yield currently under review by NW-NRA, due to environmental problems	
2672404001	Grisedale Brook							
2672405009	River Wyre							
2672406012	Barnacre Reservoir							
2672526020	River Lune							
Page Sub-Total =		1505.0	1669.0	*Source Type: GW = Groundwater; SW = Surface Water.			Page 1 of 13	

Table 5.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: North West							DATE: APRIL 1994	
Licence Number	Source Name/Location	Current Available Yield (MI/d)	Future Maximum Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Comment	
IMPORT	Lake Vyrnwy	212.5	212.5	SW	Y	North West Water Ltd (Cont'd)	Import from NRA Severn Trent Region - however only 210 MI/d available	
2569010034	Longendale Reservoirs	102.0	102.0	SW	Y		A series of 8 reservoirs includes some underground sources	
2774003008	Ennerdale	53.0	53.0	SW	Y		Only 38 MI/d was available in 1990/91	
2672403014	Langthwaite	46.7	46.7	SW	Y		A complex series of sources	
2672401001	Hareappletree							
2672526008	Lune							

Table 5.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: North West							DATE: APRIL 1994	
Licence Number	Source Name/Location	Current Available Yield (MI/d)	Future Maximum Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Comment	
2569003056	Entwistle	44.5	44.5	SW	Y	North West Water Ltd (Cont'd)		
2670210002	Rivington	43.0	43.0	SW	Y		Only 38 MI/d available for supply	
2671340027 2671314002 2671314004	Dunsop Valley	38.8	38.8	SW&GW	Y		A series of reservoirs and intakes	
2775015012	R Derwent	35.0	35.0	SW	Y		River regulation for supply from Thirlmere	
2569012104	Buckton Castle	33.0	33.0	SW	Y		Greenfield and Swineshaw valleys	
2569009111	Goyt Valley	32.8	32.8	SW	Y			
	Page Sub-Total =	227.1	227.1	*Source Type: GW = Groundwater; SW = Surface Water.			Page 3 of 13	

Table 5.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY
NRA REGION: North West							DATE: APRIL 1994
Licence Number	Source Name/Location	Current Available Yield (MI/d)	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Comment
2776009009 2776009010	Geltsdale	29.7	29.7	SW	Y	North West Water Ltd (Cont'd)	
2775012028	Crummock Water	27.3	27.3	SW	Y		
2674803003	Ulpha	22.0	22.0	SW	Y	North West Water Ltd (Cont'd)	Complex abstraction conditions
2569002197	Greenbooth/Ashworth Moor	18.4	18.4	SW	Y		
2674814005 2673717005	Poaka Beck	15.0	15.0	SW	Y		
2569009110	Kinder	14.1	14.1	SW	Y		
2569001165	Haslingden Grane	14.0	14.0	SW	Y		
2074811008	Schneider Road	13.1	13.1	GW	Y		4 b/holes

Table 5.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY
NRA REGION: North West							DATE: APRIL 1994
Licence Number	Source Name/Location	Current Available Yield (MI/d)	Future Maximum Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Comment
2671326005	Cant Clough	10.3	10.3	SW	Y	North West Water Ltd (Cont'd)	
2671325006	Hurstwood						
2568008018	Prenton	10.0	10.0	GW	Y		
2569002193	Watergrove	10.0	10.0	SW	Y		Complex reservoir system
2569021011	Lymm	9.1	9.1	GW	Y		
2569019040	Woodford	9.1	9.1	GW	Y		
2670101002	Primrose Hill	4.5	4.5	GW	Y		Only 4.5 MI/d of 9.1 MI/d available, for quality reasons
2775006104	Chapel House	9.0	9.0	SW	Y		
2775006018	Overwater						
2775006015	Aughertree Spring						
2775011017	Dash Beck						

Table 5.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: North West							DATE: APRIL 1994	
Licence Number	Source Name/Location	Current Available Yield (Ml/d)	Future Maximum Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Comment	
2569002205	Piethorne	8.1	8.1	SW	Y	North West Water Ltd (Cont'd)	A series of 6 reservoirs	
2569003058	Delph	8.1	8.1	SW	Y			
2569012108	Denshaw Valley	7.4	7.4	SW	Y		A series of 4 reservoirs	
2671322016	Barley Ogdens	6.9	6.9	SW	Y			
2671326003	Worsthorne	6.7	6.7	GW	Y			
2670202010	Worthington	3.6	3.6	SW	Y		Reservoir System	
2569012107	Castleshaw	5.0	5.0	SW	Y		2 reservoirs	

Table 5.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY
NRA REGION: North West							DATE: APRIL 1994
Licence Number	Source Name/Location	Current Available Yield (MI/d)	Future Maximum Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Comment
2673713015	Livers Water	3.3	3.3	SW	Y	North West Water Ltd (Cont'd)	
2569020037	Lower House	6.0	6.0	GW	Y		
2569019044	Adlington	5.9	5.9	GW	Y		
2569018053	Wilmslow	5.9	9.1	GW	Y		Only 5.9 MI/d available
2569025035	Park Rd South	5.7	6.8	GW	Y		Only 5.7 MI/d available
2569002206	Butterworth Hall	5.3	13.6	GW	Y		Only 5.3 MI/d available
IMPORT	Bearstone	5.0	5.0	GW	Y		Import from NRA Severn Trent Region
2569014119	Lyme Park	4.9	4.9	SW	Y		
2569018047	Langley	4.9	4.9	SW	Y		
2569019035	Lamaload	4.8	4.8	SW	Y		
	Page Sub-Total =	51.7	64.3	*Source Type: GW = Groundwater; SW = Surface Water.			Page 7 of 13

Table 5.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: North West							DATE: APRIL 1994	
Licence Number	Source Name/Location	Current Available Yield (MI/d)	Future Maximum Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Comment	
2671309027	Clitheroe	4.5	4.5	GW	Y	North West Water Ltd (Cont'd)		
2569003060	Springs/Dingle	4.6	4.6	SW	Y			
2775011016	The High	4.6	4.6	GW	Y			
2775011027	Mill Beck							
2775010009	Roughten Gill							
2569001163	Clowbridge	4.5	4.5	SW	Y		Excludes Gambleside b/h - 0.7	
2568002138	Hug Bridge	4.5	4.5	GW	Y		Linked to River Dane residual flow	
2674811009	Thornccliffe Road	4.5	4.5	GW	Y			
2569001162	Clough Bottom	4.4	4.4	SW	Y			
2671315001	Langden/Hareden	44.9	44.9	SW&GW	Y		Complex system of stream intakes and reservoirs at Longridge	
2671315002	Losterdale							
2671315003	Smelt Mill Brook							
2671315004	Lane Foot Brook							
2671315005	Penny Brook							
2671315006	Langdon/Smelt Mill b/h							
2671338012	Cowley Brook							
2671338013	Dean Brook							
	Page Sub-Total =	76.5	76.5	*Source Type: GW = Groundwater; SW = Surface Water.			Page 8 of 13	

Table 5.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: North West							DATE: APRIL 1994	
Licence Number	Source Name/Location	Current Available Yield (Ml/d)	Future Maximum Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Comment	
2671321023	Corn Close No 1	3.7	3.7	GW	Y	North West Water Ltd (Cont'd)	Only 3.7 Ml/d available	
2569018050	Tytherington	3.5	3.5	GW	Y			
2569009112	Fernilee	3.1	3.1	GW	Y			
IMPORT	Neston	3.1	3.1	GW	Y		Import from NRA Welsh Region	
2568007014	Hooton	3.0	3.0	GW	Y		Short-term emergency only - not sustainable	
2568008021	Spring Hill	3.0	3.0	GW	Y		Short-term emergency only - not sustainable	
2776004012	Haze Water	3.0	3.0	SW	Y			

Table 5.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: North West							DATE: APRIL 1994	
Licence Number	Source Name/Location	Current Available Yield (MI/d)	Future Maximum Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Comment	
2569001168	Cowpe	3.0	3.0	SW	Y	North West Water Ltd (Cont'd)		
2671321022	Boulsworth Hill	2.7	2.7	GW	Y			
2671333028	Mitchells 1 & 2	2.7	2.7	SW	Y			
2671335018	Churn Clough	2.5	2.5	SW	Y			
2670208006	Dark Lane	2.5	2.5	GW	Y			
2568002156	Rushton Spencer	2.5	2.5	GW	Y			
IMPORT	Ramsden	2.4	2.4	GW	Y		Import from NRA Yorkshire Region	
2569030038	Green Lane/Dudlow Lane	2.9	2.9	GW	Y			
2774006003	Worm Gill	2.3	2.3	SW	Y			
2670101009	Halsall	2.5	2.5	GW	Y			

Table 5.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: North West							DATE: APRIL 1994	
Licence Number	Source Name/Location	Current Available Yield (Ml/d)	Future Maximum Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Comment	
2569002127	Spring Mill	2.3	2.3	SW	Y	North West Water Ltd (Cont'd)		
2671340031	Sunnyhurst	2.3	2.3	SW	Y			
2569025048	Haydock Park	2.3	2.3	GW	Y			
2673718004	Simpson Ground	2.2	2.2	SW	Y			
2674812003	Baystone Bank	2.2	2.2	SW	Y		Only 1.9 available for supply 1992	
2671321040	Corn Close 2	2.2	2.2	GW	Y			
2776007085	Eden Hall	2.2	2.3	GW	Y			
2671336003	Dean Clough	2.0	2.0	SW	Y			
2568002139	Forge Lane	2.0	2.0	GW	Y			
	Page Sub-Total =	19.7	19.8	*Source Type: GW = Groundwater; SW = Surface Water.			Page 11 of 13	

Table 5.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: North West							DATE: APRIL 1994	
Licence Number	Source Name/Location	Current Available Yield (MI/d)	Future Maximum Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Comment	
2569019036	Millbrook	2.0	2.0	GW	Y	North West Water Ltd (Cont'd)		
2671309029	Waddington Fell	2.0	2.0	GW	Y			
2569010040	Hurst	1.9	1.9	SW	Y			
2776002004	Clibum	1.8	1.8	GW	Y		3 b/holes	
2671323024	Coldwell	1.7	1.7	SW	Y			
2671321023	Lane Shaw	1.7	1.7	SW	Y			
2671332013	Altham	1.6	4.5	GW	Y		4 b/holes. Only 1.6 MI/d available	
2569010038	Swineshaw	1.6	1.6	SW	Y			
2776007073	Bowscar	1.5	3.4	GW	Y		2 b/holes. Only 1.5 MI/d available	
2672526007	Tarnbeck	2.0	2.0	SW	Y			
2776014008	Roughton Gill	1.9	1.9	SW	Y			
2776004013	Aira Beck	1.8	1.8	SW	Y			
267309026	Grindleton	1.6	1.6	SW	Y			
Page Sub-Total =		23.1	27.9	*Source Type: GW = Groundwater; SW = Surface Water.			Page 12 of 13	

Table 5.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: North West							DATE: APRIL 1994	
Licence Number	Source Name/Location	Current Available Yield (MI/d)	Future Maximum Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Comment	
2775008007	Bull Fell	1.5	1.5	GW	Y	North West Water Ltd (Cont'd)		
2671322033	Blackmoss	10.5	10.5	SW	Y		Compensation reduced from 3.56 to 2.68 in 1991	
2673602003	Dubbs	1.4	1.4	SW	Y			
2569003072	Longworth Clough	1.4	1.4	GW	Y			
2568002146	Mow Cop	1.4	1.4	GW	Y			
2671325006	Swindens	1.3	1.3	SW	Y		3 reservoirs	
2569020030	Broomedge	1.1	1.1	GW	Y			
2569018049	London Road	1.1	1.1	GW	Y			
2776001012	Bankwood	1.0	1.0	GW	Y			
2673708011	Ghyll Head	1.0	1.0	SW	Y			
	Boreholes in Southern Command Zone	171	171	GW	Y			
	WATER COMPANY TOTAL		3001.3					
	Page sub-Total =	192.7	192.7					
	OVERALL TOTAL =	2819.8	3001.3	*Source Type: GW = Groundwater; SW = Surface Water.			Page 13 of 13	

Table 5.2

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		INTER-REGIONAL TRANSFERS			NATIONAL RIVERS AUTHORITY
NRA REGION: North West					DATE: APRIL 1994
From (NRA region)	To (NRA region)	Source	Volume (Ml/d)	Comment	
North West	Severn Trent	Audley Borehole & Others	-21		
North West	Welsh	Plemstall	-2		
Sub-total			-23		
Severn Trent	North West	Lake Vyrnwy	+212.5		
Severn Trent	North West	Bearstone borehole	+5		
Welsh	North West	River Dee	635	74 Ml/d of licensed entitlement currently unused	
Welsh	North West	River Dee (Nantwich)	+50		
Yorkshire	North West	Fernilee, Neston and Ramsden boreholes	+8.6		
Sub-total			+911.1		
TOTAL			+888.1		
Page 1 of 1					

Table 5.3

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		POTENTIAL FUTURE REGIONAL DEVELOPMENTS				NATIONAL RIVERS AUTHORITY	
NRA REGION: North West						DATE: APRIL 1994	
Line No	Development Name	Source* Type	Yield (Ml/d)	Yield Est. Agreed with Undertaker (Y/N)	Comment	Status and Class	
1	West Cumbria source	GW			Under investigation	3	B
2	R Dee	SW	74	N		1	A
3	Wye/Lune transfer	SW	80	Y	Additional operating costs	1	A
4	Pumped storage of Rivington Res	SW	40		Fishery implications	1	A
TOTAL			194	* Source Type: GW = Groundwater, SW = Surfacewater			Page 1 of 1

Table 5.4

North West Region				
Development Date	1993	2001	2011	2021
Existing Source Yield (MI/d)	2819.5	2819.5	2819.5	2819.5
Possible yield Cutbacks (MI/d)	-50	-50	-50	-50
Potential Future Schemes (MI/d)		+ 10	+ 10	+ 10
TOTAL	2769.5	2779.5	2779.5	2779.5

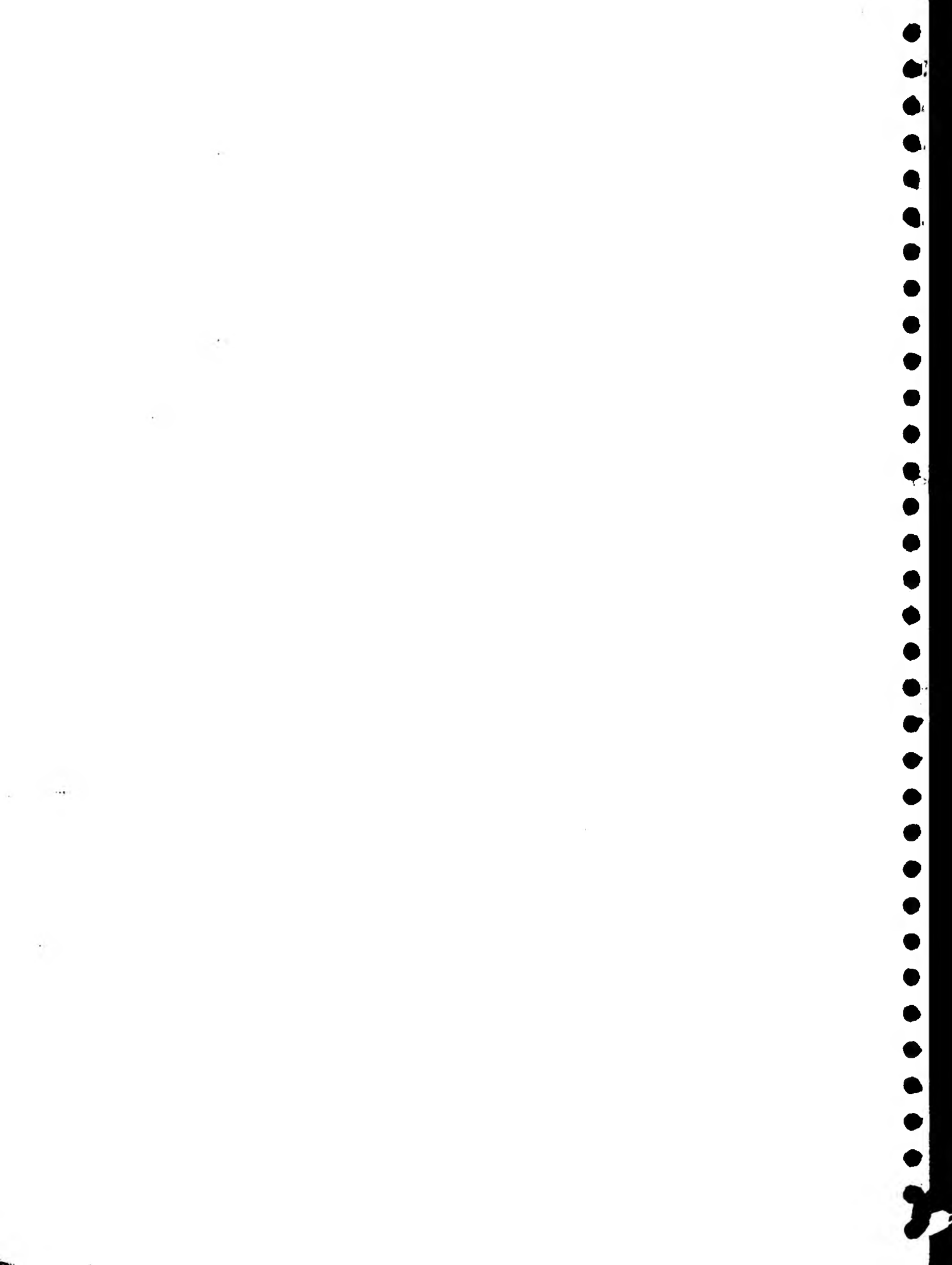


Table 6.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Severn Trent							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment (see explanatory notes)	
	Bellington gws	11.4	GW	Y	East Worcestershire Waterworks Company			
	Bromsgrove group gws	44.0	GW	Y				
	Droitwich group gws	9.0	GW	Y				
PART IMPORT	Cotswold spring sources	3.9	GW	Y			1.5 Ml/d of this yield is imported from Thames Region	
	WATER COMPANY TOTAL	68.3						
Page Sub-Total =		68.3	*Source Type: GW = Groundwater; SW = Surface Water.					
Page 1 of 9								

Table 6.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Severn Trent							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment (see explanatory notes)	
	Mayfield gws	0.4	GW	Y	South Staffordshire Water Company			
	Crumpwood/Hulme Springs gws	9.0	GW	Y				
	Rugeley/Litchfield group gws	25.0	GW	Y				
	Hopwas/Sandfield gws	7.0	GW	Y				
	Trent Valley/Fradley/Chilcote gws	27.0	GW	Y				
	Shenstone unit group gws	36.0	GW	Y				
	Somerford/Slade Heath gws	7.5	GW	Y				
	Stour Valley group gws	85.0	GW	Y				
	Blithfield Resvr	40.0	GW	Y				
	Hampton Loade R Severn	120.0	SW	Y			(1) and (2)	
	WATER COMPANY TOTAL	356.9						
Page Sub-Total =		356.9	*Source Type: GW = Groundwater; SW = Surface Water.					
Page 2 of 9								

Table 6.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Severn Trent							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment (see explanatory notes)		
	Llandinam river gravels	14.3	GW	Y	Severn Trent plc	West Shropshire/ Montgomery			
	Sarn	0.5	GW	Y					
	Oswestry/Ellesmere/N. Montgomery gws	17.0	GW	Y					
	Pen-y-Gwely Resvr	1.4	SW	Y					
	Shelton R Severn	18.0	SW	Y			(1)		
	Shelton gws	13.0	GW	Y					
	Shrewsbury gws	10.4	GW	Y					
Licence exempt	Machynlleth local sources	1.7	GW	Y					
	Whitchurch/Wern gws	8.0	GW	Y		East Shropshire			
	Market Drayton gws	4.0	GW	Y					
	Telford/Newport gws	50.9	GW	Y			(13)		
	Ludlow/Bridgnorth gws	5.6	GW	Y					
IMPORT	Overton Scar	3.0	GW	Y			Import from NRA North West Region		
	Cosford Unit gws	21.4	GW	Y		Wolverhampton	(13)		
	Worfield Unit gws	26.9	GW	Y					
	Wombourne Unit gws	28.5	GW	Y			(13)		
	Hampton Loade R Severn	60.0	SW	Y			(1) and (2)		
Page Sub-Total =		284.6	*Source Type: GW = Groundwater; SW = Surface Water.					Page 3 of 9	

Table 6.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Severn Trent							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment (see explanatory notes)		
IMPORT	Elan Valley Resvr	327.0	SW	Y	Severn Trent plc (Cont'd)	Birmingham	(3) Import from NRA Welsh Region		
	Trimpley R Severn	60.0	SW	Y			(1) and (2a)		
	Stourbridge gws	14.9	GW	Y		Worcester			
	Kidderminster gws	30.1	GW	Y					
	Worcester/Malvern/Tenbury gws	9.4	GW	Y				(15)	
	Barbourne R Severn	31.8	SW	Y				(1) and (14)	
	Mythe R Severn	109.0	SW	Y		Gloucester		(1), (4) and (14) 109 is the current licensed value	
IMPORT	Mitcheldean R Wye	34.0	SW	Y				(5) Import from NRA Welsh Region	
	Cotswold local sources	2.2	SW + GW	Y					
	Dowdeswell Resvr	1.5	SW	Y					
	Newent/Ketford gws	4.6	GW	Y				(15)	
IMPORT	Forest of Dean gws	11.6	GW	Y				(6) Import from NRA Welsh Region	
	Chalford Springs	9.5	SW	Y					
	Caswell/Millend sws	1.8	SW	Y					
	</								

Table 6.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Severn Trent							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment (see explanatory notes)	
	Strensham R Severn	107.8	SW	Y	Severn Trent plc (Cont'd)	Warwickshire	(1)	
	Campion Hills R Leam	22.0	SW	Y			(7)	
	Draycote TW	14.0	SW	Y			(8)	
	Avon TW	16.0	SW	Y			(9)	
	Whitacre TW	25.0	SW	Y			(10)	
	Coventry gws	25.7	GW	Y				
	Meriden gws	10.0	GW	Y				
	S Warks local sources	19.6	GW + SW	Y				
	Derwent Valley Resvr	135.0	SW	Y		East Midlands	(11)	
	Homesford Meerbrook Sough	45.0	SW	Y				
	Little Eaton, R Derwent	38.0	SW	Y				
	Church Wilne, R Derwent	90.0	SW	Y			(12) Yield will increase as treatment capacity is extended to take up the currently unallocated proportion of the yield from Carsington	
	Ogston Resvr	43.0	SW	Y				
	Foremark & Staunton Harold Resvrs	185.0	SW	Y				
	Charnwood Resvrs	15.9	SW	Y				
	NW Derby local sources	9.2	GW + SW	Y				
	Derby local sources	1.5	GW + SW	Y				
	Page Sub-Total =	802.7	*Source Type: GW = Groundwater; SW = Surface Water.					Page 5 of 9

Table 6.1 continued[illegible]

Table 6.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS . AUTHORITY		
NRA REGION: Severn Trent							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment (see explanatory notes)		
	Tittesworth Resvr	24.0	SW	Y	Severn Trent plc (Cont'd)	Stoke			
	Pool End/Highgate/ Wallgrange gws	25.7	GW	Y					
	Forsbrook Unit gws	16.4	GW	Y					
	Greatgate gws	7.2	GW	Y					
	Teanford/Draycott gws	8.5	GW	Y					
	Spot/Blacklake/Moddershall gws	4.5	GW	Y					
	Fulford/Mossgate gws	4.0	GW	Y					
	Swynnerton gws	8.6	GW	Y					
	Hatton/Mill Meece/Whitmore gws	38.0	GW	Y					
	Croxton/Jugbank/Burntwood gws	3.0	GW	Y			Jugbank to be abandoned but no effect on yield		
	Wellings gws	6.8	GW	Y					
	Hollies gws	7.3	GW	Y					
	Weston Jones gws	7.0	GW	Y					
	Bednall/Shugborough/Milford gws	14.4	GW	Y					
	Page Sub-Total =	175.4	*Source Type: GW = Groundwater; SW = Surface Water.					Page 7 of 9	

Table 6.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Severn Trent							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment (see explanatory notes)	
	Upper Hulme gws	2.0	GW	Y	Severn Trent plc (Cont'd)	Stake (Cont'd)		
	Eastwall	0.8	GW	Y				
IMPORT	Audley/Peckforton/Elmhurst	21.6	GW	Y			Imports from NRA North West and Welsh Regions	
IMPORT	Rutland Water	13.5	SW	Y			Import from NRA Anglian Region	
	WATER COMPANY TOTAL	2194.8						
Page Sub-Total =		37.9	*Source Type: GW = Groundwater; SW = Surface Water.					Page 8 of 9

Table 6.1 continued[illegible]

EXPLANATORY NOTES

- (1) Yield of sources on the River Severn is supported by augmentation during low flows from Clywedog Reservoir, Lake Vyrnwy, and the Shropshire Groundwater.
- (2) Reliable yield for Hampton Loade is 180 MI/d made up from 120 MI/d allocated to South Staffs Water and 60 MI/d to Severn Trent Water. This is currently constrained by the licence limit.
- (2a) Trimpley licence is currently 60 MI/d; a licence variation to increase the yield to 95 MI/d is pending.
- (3) Elan Valley Reservoirs are located in Welsh Region and the value quoted in the Table represents the reliable yield of the imported supply to Severn Trent Water.
- (4) Mythe licence is currently 109 MI/d with a licence variation pending to allow a reliable yield of 120 MI/d to be achieved.
- (5) Mitcheldean treatment works is supported by an abstraction from the River Wye at Lydbrook and therefore represents an import to Severn Trent Region from Welsh Region; the quoted yield excludes part of the licensed quantity only available for bulk supply to Dwr Cymru (shown on Table 10.1, Welsh Region).
- (6) A number of boreholes in this group are located in Welsh Region.
- (7) River Leam abstractions are supported during low flow periods by releases from Draycote Reservoir.
- (8) Currently this works is fed from a direct abstraction from Draycote Reservoir; a licence variation is pending to allow for closure of Avon TW and reallocation of resource yield to Draycote TW of Stanford Reservoir and Brownsover; see (9).
- (9) Treatment works fed from Stanford Reservoir, River Avon abstraction at Brownsover and Draycote Reservoir; to be closed and resources reallocated to Draycote TW; see (8)
- (10) Whitacre treatment works is supported by direct abstraction from the Rivers Blythe and Bourne and Shustoke Reservoir; reliable yield of 41 MI/d is temporarily suppressed because of the unavailability for quality reasons of Shustoke Reservoir.
- (11) The total reliable yield of the Derwent Valley system has been assessed at 175 MI/d made up of 135 MI/d for Severn Trent and 40 MI/d exported to Yorkshire Water.

Table 6.2

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		INTER-REGIONAL TRANSFERS			NATIONAL RIVERS AUTHORITY
NRA REGION: Severn Trent					DATE: APRIL 1994
From (NRA region)	To (NRA region)	Source	Volume (MI/d)	Comment	
Severn Trent	Wessex	Gloucester/Sharpness Canal	-190		
Severn Trent	North West	Lake Vyrnwy	-212.5		
Severn Trent	North West	Bearstone Boreholes	-5		
Severn Trent	Yorkshire	Doncaster Boreholes	-83	Planned to be cut-back to -65MI/d by 1994	
Severn Trent	Thames	Brockley	-3.2		
Severn Trent	Yorkshire	Ladybower Reservoir	-40		
Severn Trent	Anglian	Bunter Sandstones	-69		
Severn Trent	Anglian	River Trent	-85		
Severn Trent	Welsh	Leintwardine GW	-0.8		
Severn Trent	Welsh	Whitbourne	-9		
Sub-Total			-697.5		
					Page 1 of 2

Table 6.2 (Cont'd)

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		INTER-REGIONAL TRANSFERS		NATIONAL RIVERS AUTHORITY	
NRA REGION: Severn Trent				DATE: APRIL 1994	
From (NRA region)	To (NRA region)	Source	Volume (Ml/d)	Comment	
Welsh	Severn Trent	Elan Valley Reservoirs	+ 327		
Welsh	Severn Trent	River Wye, Mitcheldean	+ 33.3		
Welsh	Severn Trent	Forest of Dean GW	+ 11.6		
North West	Severn Trent	Audley Borehole & Others	+ 21		
Thames	Severn Trent	Upper Thames (Cotswold Springs)	+ 1.5		
Anglian	Severn Trent	Rutland	+ 18		
Sub-Total			+ 412.4		
TOTAL			-285.1		
				Page 2 of 2	

Table 6.3

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		POTENTIAL FUTURE REGIONAL DEVELOPMENTS				NATIONAL RIVERS AUTHORITY	
NRA REGION: Severn Trent						DATE: APRIL 1994	
Line No	Development Name	Source* Type	Yield (Ml/d)	Yield Est. Agreed with Undertaker (Y/N)	Comment	Status and Class	
	West Shropshire Area Developments		34	Y		2	B
	East Shropshire Area Developments		12.2	Y		2	B
	Wolverhampton Area Developments		13.6	Y		2	B
	Worcester Area Development		2.0	Y		2	B
	Glooucester Area Developments		5.8	Y		2	B
	South Warwickshire/Coventry		21.3	Y		2	B
	Stoke Area Developments		15.1	Y		2	B
	South Staffs Water Company	GW	37	Y		2	B
TOTAL			141	* Source Type: GW = Groundwater, SW = Surfacewater			Page 1 of 1

Table 6.4

Severn Trent Region				
Development Date	1993	2001	2011	2021
Existing Source Yield (MI/d)	2620	2620	2620	2620
Possible yield Cutbacks (MI/d)	0	-90	-132	-175
*Potential Future Schemes (MI/d)	0	+ 141	+ 141	+ 141
TOTAL	2620	2671	2629	2586

Table 7.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Southern							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
511007 and 511002	Walderton	31.70	GW	Y	Portsmouth Water Company			
520101	Woodmancote	3.00	GW	Y				
521502	Fishbourne	8.00	GW	Y				
521301	Funtington	5.00	GW	Y				
522002	Lavant and Brickkiln	20.00	GW	Y				
542108	Eastergate	11.00	GW	Y				
	Slindon	1.00	GW	Y				
	Westergate	14.00	GW	Y				
36.2/1	Havant and Bedhampton	53.00	GW	Y				
33.6/10	Worlds End	12.0	GW	Y				
28.3/15	Soberton	8.0	GW	Y				
25.2/15	Hoe	5.0	GW	Y				
25.2/50	Northbrook	22.0	GW	Y				
33.9/20	Maindell	3.0	GW	Y				
33.1/1	Lovedean	12.0	GW	Y				
28.3/44	West Street	8.3	GW	Y				
28.3/15	West Meon	0.5	GW	Y				
22.10/134	River Itchen	45.0	SW	Y				
	WATER COMPANY TOTAL	262.5						
	Page Sub-Total =	262.5	*Source Type: GW = Groundwater; SW = Surface Water.					Page 1 of 16

Table 7.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY			
NRA REGION: Southern							DATE: APRIL 1994			
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment			
2/220/G	Borough Green	1.30	GW	Y	Mid Kent Water Company					
	Nepicar Lane	1.40	GW	Y						
	Ryarsh and Polsworth	1.40	GW	Y						
	Trosley and Wrotham	7.00	GW	Y						
1/161/G	Ridley	1.20	GW	Y						
1/14//A/GR	Hartley (Chalk)	4.55	GW	Y						
1/148/B/GR	Hartley (Greensand)	1.80	GW	Y						
5/092	Goudhurst (Ashdown Beds)	3.80	GW	Y						
4/269/GR	Charing	2.50	GW	Y						
4/271/GR	Barham	4.55	GW	Y						
4/267/GR	Godmersham	13.64	GW	Y						
4/292/GR	Chilham	13.64	GW	Y						
	Chartham									
	Chilham Gravel									
2/252/G	Boughton	2.00	GW	Y						
	Ospringe	8.09	GW	Y						
	Copton	1.00	GW	Y						
Page Sub-Total =		67.87	*Source Type: GW = Groundwater; SW = Surface Water.				Page 2 of 16			

Table 7.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Southern							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
2/251/G	Newnham	3.90	GW	Y	Mid Kent Water Company (Cont'd)				
	Improved Newnham	2.00	GW	Y					
	Wichling	6.60	GW	Y					
	Wineycock Shaw	4.00	GW	Y					
3/555/G	Thurnham	4.50	GW	Y					
	Hockers Lane	2.00	GW	Y					
2/250/G	Boxley Borehole G/S	0.80	GW	Y					
	Forstal	6.00	GW	Y					
3/383/G (H5)	Cossington Well	0.90	GW	Y					
3/383/GR	Boxley Well Chalk	1.20	GW	Y					
2/250/G (H2)	Cossington Springs	1.20	GW	Y					
2/127/GR	Halling	4.00	GW	Y					
4/438/GR	Hoplands Farm	4.54	GW	Y					
4/0427/G	Howfield	13.64	GW	Y					
4/427/G	Thanington	17.50	GW	Y					
4/281/GR	Ford	2.27	GW	Y					
2/304/G	Stockbury	3.00	GW	Y					
5/091	Bowl Borehole	1.80	GW	Y					
	WATER COMPANY TOTAL	147.72							
Page Sub-Total =		79.85	*Source Type: GW = Groundwater; SW = Surface Water.					Page 3 of 16	

Table 7.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Southern							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
4/60/GR	Otinge	1.40	GW	Y	Folkestone & Dover Water Services			
	Skeete	0.25	GW	Y				
	Worlds Wonder	2.27	GW	Y				
4/65/GR	Lye Oak	12.60	GW	Y				
	Drellingore							
	Lower Standen							
4/62/GR	Cherry Garden Springs	0.24	GW	Y				
	Terlingham Tunnel							
	Shearway	2.90	GW	Y				
4/372/G	St Margarets	4.55	GW	Y				
4/452/G	Lighthouse (DOV/DL)	1.40	GW	Y				
4/248/GR	Connaught Dover	7.50	GW	Y				
4/377/G	South Denton	6.80	GW	Y				
	Tappington North							
	Tappington South							
	Rakeshole North							
	Rakeshole South							
Ladwood								
4/422/G	Poulton	0.10	GW	Y				
4/0180/G	Primrose	1.26	GW	Y				
Page Sub-Total =		41.27	*Source Type: GW = Groundwater; SW = Surface Water.					Page 4 of 16

Table 7.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Southern							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
4/0273/G	North Denton (Broome)	1.60	GW	Y	Folkestone & Dover Water Services			
5/6/GR	Hythe Springs	0.30	GW	Y				
5/71/G	Denge	6.00	GW	Y				
4/497/G	Kingsdown	2.45	GW	Y				
	WATER COMPANY TOTAL	51.62						

Table 7.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Southern							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
1/143/GR	Cramptons Road	16.0	GW	Y	South East Water	West Kent Water Company (Cont'd)			
1/142/GR	Kemsing	2.0	GW	Y					
1/141/GR	Oak Lane	0.9	GW	Y					
3/470/G	Tonbridge	2.5	GW	Y					
3/291/GR 3/474/G	Pembury	8.0	GW	Y					
3/288/GR	St Hill	3.4	GW	Y					
3/473/G	Chase Wood	0.3	GW	Y					
151301	Chalk Groundwater	27.1	GW	Y					
152004	Arlington Reservoir	19.8	SW	Y		Eastbourne Water Company			
155001	Cowbeach	1.5	GW	Y					
120302 122001	Wallers Haven	6.8	SW + GW	Y					
121002	Hazards Green	1.0	GW	Y					
121302	Sweet Willow Wood	1.5	GW	Y					
611661GR 61260/S	Crowhurst Bridge	9.4	GW + SW	Y					
6169/GR 6/285/S	Sedlescombe	1.3	GW + SW	Y					
111201	Powermill	1.6	GW	Y					
Page Sub-Total =		103.1	*Source Type: GW = Groundwater; SW = Surface Water.					Page 6 of 16	

Table 7.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Southern							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
260401	Poverty Bottom	16.4	GW	Y	South East Water (Cont'd)	Mid Sussex Water Company		
	Cowish Bottom							
	Rathfinny							
312505	Offham	0.60	GW	Y				
312504	Saddlescombe	1.13	GW	Y				
	Clayton	1.13	GW	Y				
	Coombe Down	0.32	GW	Y				
	Whitelands	0.32	GW	Y				
284003	Holywell/Cockhaise	4.03	GW	Y				
292003	Hempstead	1.80	GW	Y				
3/375/GR	Forest Row	1.82	GW	Y				
3/374/GR	Hackenden	0.45	GW	Y				
3/380/GR	Groombridge	3.2	GW	Y				
6/164/GR	Coggins Mill	1.36	GW	Y				
271002	Barcombe Mills	39.50	SW	N				
283509	Shell Brook	4.54	SW	Y				
	WATER COMPANY TOTAL	179.7						
	Page Sub-Total =	76.6	*Source Type: GW = Groundwater; SW = Surface Water.					Page 7 of 16

Table 7.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Southern							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
18.16/546	Testwood	132.72	SW	Y	Southern Water Services	Hampshire South		
18.12/384	Timsbury	10.75	GW	Y				
22.6/93	Otterbourne	45.46	SW	Y				
22.7/94	Otterbourne	54.55	GW	Y				
22.6/92	Twyford	16.00	GW	Y				
22.4/80	Easton and Romsey	18.20	GW	Y		Hampshire Winchester		
22.3/55	Tottford	4.55	GW	Y				
18.3/564	Barton Stacey	1.13	GW	Y				
18.8/335	Broughton	4.36	GW	Y		Hampshire Broughton		
18.9/554	Horsebridge	2.88	GW	Y				
18.11/367	West Tytherley	0.50	GW	Y				
18.6.1/481	Andover	16.00	GW	Y		Hampshire Andover		
18.5/173	Chilbolton	0.50	GW	Y				
18.1/48	Overton	1.64	GW	Y				
18.1/47	Whitchurch	1.64	GW	Y				
18.2/101	Ibthorpe	2.50	GW	Y				
IMPORTS	Kingsclere	5.70	GW	Y		Hampshire Kingsclere	Imports from NRA Thames Region	
	East Woodhay	3.00	GW	Y				
Page Sub-Total =		322.08	*Source Type: GW = Groundwater; SW = Surface Water.					Page 8 of 16

Table 7.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Southern							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
3/G/41	Carlsbrooke	9.00	GW	Y	Southern Water Services (Cont'd)	Isle of Wight		
3/G/42	Bowcombe	2.00	GW	Y				
2/G/10	Ashey	0.30	GW	Y				
1/G/76	Knighton	6.50	GW	Y				
3/G/39	Chillerton	2.10	GW	Y				
3/G/40	Broadfields	1.00	GW	Y				
7/G/10	Ventnor	1.70	GW	Y				
7/G/8	St Lawrence	0.43	GW	Y				
4/G/8	Calbourne	1.00	GW	Y				
4/G/9	Shalcombe	0.40	GW	Y				
6/G/20	Brightstone	0.24	GW	Y				
1/G/75	Niton	0.25	GW	Y				
7/G/7	Shanklin Greatwoods	0.10	GW	Y				
7/G/9	Luccombe	0.05	GW	Y				
5/G/8	Freshwater	0.34	GW	Y				
1/S/63	Sandown (Eastern Yar)	17.00	GW + SW	Y			These licences represent groundwater augmentation and river intakes involved in the River Eastern Yar.	
3/S/32								
3/G/50								
	Page Sub-Total =	42.41	*Source Type: GW = Groundwater; SW = Surface Water.					Page 9 of 16

Table 7.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Southern Region							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
4/279	Deal	3.00	GW	Y	Southern Water Services (Cont'd)	Kent Thanet			
4/56/GR	Flemings	8.40	GW	Y					
4/57/GR	Woodnesborough	2.49	GW	Y					
4/337/G	Martin Gorse	5.00	GW	Y					
4/272/GR	Martin Mill	0.90	GW	Y					
4/437/G	Ringwould	3.00	GW	Y					
4/341/G	Sutton	4.40	GW	Y					
4/49/GR	Sparrow Castle	2.30	GW	Y					
	Lord of Manor Whitehall	7.50	GW	Y					
	Rumfleds	0.90	GW	Y					
4/58/GR	Wingham	20.00	GW	Y					
4/441	Minster A + B	4.40	GW	Y					
	Page Sub-Total =	62.29	*Source Type: GW = Groundwater; SW = Surface Water.					Page 10 of 16	

Table 7.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Southern							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
310210	Anmering	3.50	GW	Y	Southern Water Services (Cont'd)	Sussex Central		
	Patching	5.00	GW	Y				
	Burpham	3.00	GW	Y				
	Northbrook	2.00	GW	Y				
	Stanhope Lodge	6.50	GW	Y				
	Broadwater	13.00	GW	Y				
	Findon	6.00	GW	Y				
	Sompting	7.50	GW	Y				
	Clapham	3.50	GW	Y				
	Madehurst	9.10	GW	Y				
	Arundel	4.0	GW	Y				
Page Sub-Total =		63.1	*Source Type: GW = Groundwater; SW = Surface Water.				Page 11 of 16	

Table 7.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Southern							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
260103	Southover	17.00	GW	Y	Southern Water Services (Cont'd)	Sussex Central (Cont'd)		
	Balsdean	13.50	GW	Y				
	Newmarket	14.80	GW	Y				
	Falmer	7.50	GW	Y				
	Patcham	7.50	GW	Y				
	Surrenden	3.30	GW	Y				
	Shoreham	5.50	GW	Y				
	Mile Oak	7.50	GW	Y				
	Goldstone	18.30	GW	Y				
	Lewes Road	5.80	GW	Y				
	Housedean	6.70	GW	Y				
	Mossy Bottom	3.80	GW	Y				
310009	Aquadom	0.20	GW	Y		Sussex East		
111001	Filsham	0.62	GW	Y				
110202	Buckshole	0.50	GW	Y				
6/160/G	Cadborough	0.50	GW	Y				
6/157/G	Brede	2.26	GW	Y				
6/163/SR	Darwell	19.00	SW	Y				
6/159/SR	Powdermill	2.10	SW	Y				
Page Sub-Total =		136.38	*Source Type: GW = Groundwater; SW = Surface Water.					Page 12 of 16

Table 7.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Southern							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
311008	Steyning	0.70	GW	Y	Southern Water Services (Cont'd)	Sussex West		
431301	Haslingbourne	1.50	GW	Y				
432308	Lodsworth	2.14	GW	Y				
433006	Easebourne (Rotherfield)	1.36	GW	Y				
434007	Rogate	2.27	GW	Y				
431002	Hardham (Ground)	18.0	GW	Y				
431001	Hardham (Surface)	27.5	SW	Y				
3/387	Weirwood	13.50		Y				
1/511/G	Hazells	3.50	GW	Y		Kent Medway		
	Hazells Improvement	3.40	GW	Y				
	Northfleet (CK)	8.00	GW	Y				
	Northfleet (GR)	1.00	GW	Y				
	Higham	0.70	GW	Y				
	Three Crutches	0.50	GW	Y				
	Strood	3.80	GW	Y				
	Cuxton	6.10	GW	Y				
	Luddesdown (CK)	2.80	GW	Y				
	Luddesdown (GR)	1.80	GW	Y				
	Windmill Hill	3.00	GW	Y				
	Page Sub-Total =	101.57	*Source Type: GW = Groundwater; SW = Surface Water.				Page 13 of 16	

Table 7.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY				
NRA REGION: Southern							DATE: APRIL 1994				
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment				
1/150/GR	Fawkham	5.10	GW	Y	Southern Water Services (Cont'd)	Kent Medway					
2/236/G	Nashenden	4.80	GW	Y							
	Snodhurst	3.50	GW	Y							
	Luton	4.60	GW	Y							
	Capstone CK and GR	4.10	GW	Y							
	Rainham Mark	0.90	GW	Y							
2/237/G	Keycol	1.20	GW	Y							
	Highsted	6.50	GW	Y							
	Improved Highsted	3.00	GW	Y							
	Matts Hill	13.20	GW	Y							
	Gore	3.30	GW	Y							
	Sheerness East	0.80	GW	Y							
	Wallend	1.00	GW	Y							
2/238	Belmont	7.0	GW	Y							
	Throwley	7.30	GW	Y							
	Throwley Improvement	1.70	GW	Y							
	Selling	8.00	GW	Y							
Page Sub-Total =		76.0	*Source Type: GW = Groundwater; SW = Surface Water.					Page 14 of 16			

Table 7.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Southern							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
1/511/G(1)	Dean Farm	4.00	GW	Y	Southern Water Services (Cont'd)	Kent Medway (Cont'd)		
2/237	Danaway	3.40	GW	Y				
2/114	Medway Scheme	64.02	SW	Y				
	WATER COMPANY TOTAL	875.25						
Page Sub-Total =		71.42	*Source Type: GW = Groundwater; SW = Surface Water.					
Page 15 of 16								

Table 7.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Southern							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
	WATER COMPANY TOTAL	262.5			Portsmouth Water Company			
	WATER COMPANY TOTAL	147.72			Mid Kent Water Company			
	WATER COMPANY TOTAL	51.62			Folkestone & Dover Water Services			
	WATER COMPANY TOTAL	179.7			South East Water			
	WATER COMPANY TOTAL	875.25			Southern Water Services			

Table 7.2

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		INTER-REGIONAL TRANSFERS			NATIONAL RIVERS AUTHORITY
NRA REGION: Southern					DATE: APRIL 1994
From (NRA region)	To (NRA region)	Source	Volume (Ml/d)	Comment	
Southern	Thames	Bough Beech Reservoir	30		
Southern	Thames	Paines, Tatefield, Westwood Boreholes	-8		
Southern	Thames	North Park, Flower, Duckpit Boreholes	-4		
Southern	Thames	Oakshott, Mean, Hawkley, Sheet, Greatham, Woodgarston Boreholes	-20.3		
TOTAL			62.3		
					Page 1 of 1

Table 7.3

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		POTENTIAL FUTURE REGIONAL DEVELOPMENTS				NATIONAL RIVERS AUTHORITY	
NRA REGION: Southern						DATE: APRIL 1994	
Line No	Development Name	Source* Type	Yield (Ml/d)	Yield Est. Agreed with Undertaker (Y/N)	Comment	Status and Class	
1	Darwell Reservoir Enlargement	SW	42	Y	Abstraction licence applied for	4	A
2	Yalding	SW	29	Y	Abstraction licence granted 1992	4	A
3	Rother-Medway link	SW	5	N	Being investigated by water companies	1	A
4	Test groundwater scheme	GW	25	N	NRA Scheme	1	D
5	River Itchen Development	GW/SW	70	N	NRA scheme	1	D
6	Testwood Lakes	SW	5			2	A
7	Hardham	GW	unknown	N	Potential being reassessed by WCo's	1	A
8	Local groundwater	GW	6	N	Small scale development unlikely to be approved	1	A
9	Crowhurst Bridge	SW	4	Y	Abstraction licence granted 1992	3	A
10	Chillerton Reservoir	SW	9	N	(After 2021)	1	D
11	Havant Thicket Reservoir	SW	30	N	(After 2021)	1	D
TOTAL			225	* Source Type: GW = Groundwater, SW = Surfacewater			Page 1 of 1

Table 7.4

Southern Region					
Development Date	1993	2001	2011	2021 incl Class D schemes	2021 excl Class D schemes
Existing Source Yield (MI/d)	1517	1517	1517	1517	1517
Possible yield Cutbacks (MI/d)	0	-20	-20	-20	-20
Potential Future Schemes (MI/d)	0	+91	+91	+225	+91
TOTAL	1517	1588	1588	1722	1588

Table 8.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY			
NRA REGION: South West							DATE: APRIL 1994			
Licence Number	Source Name/Location	Yield** (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment			
24/S/31	Drift reservoir	11.6	SW	N	South West Water Services	Colliford				
24/G/75	Polteggan well	0.0	GW	N						
26/G/201	Fortescue shaft	0.0	GW	N						
231/S/14	Argal + College reservoirs	38.7	SW	N						
232/S/14	River Cober (Wendron)									
252/S/22	River Hayle									
22/S/23	Stithians reservoir									
22/S/29	Kennal vale									
26/S/35	Cargenwyn res (stream + springs)	2.1	GW & SW	N						
26/S/45	Carwynnen stream									
26/S/55	Roseworthy stream									
26/S/57	Boswyn stream									
26/G/189	Boswyn shaft + Cooper Hill adit									
272/S/9	River Porth and Porth Reservoir	8.2	SW	N						
272/G/50	Trewollack mineshaft	0.0	GW	N						
281/S/23	Crowdy reservoir	6.0	SW	N						
Page Sub-Total =		66.6	*Source Type: GW = Groundwater; SW = Surface Water.					Page 1 of 7		

** Four week peak yield

Table 8.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY						
NRA REGION: South West							DATE: APRIL 1994						
Licence Number	Source Name/Location	Yield** (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment						
18/S/32	River Fowy at Trekeivesteps	104.2	SW	N	South West Water Services (Cont'd)	Colliford (Contd)							
18/S/35	Colliford Lake												
18/S/40	River Fowy, Restormel												
283/S/3	De Lank river												
18/S/34	Siblyback reservoir												
141/S/26	Withybrook, Bastreet												
07/0135	Gammaton reservoir	0.0	SW	N		Roadford, N Devon & Plymouth							
07/0136	Red-a-ven/Black-a-ven	0.0	SW	N									
07/0141	Melbury reservoir	0.0	SW	N									
07/0167	West Okement/Meldon reservoir	25.6	SW	N									
07/0173	River Torridge	0.0	SW	N									
08/0535	Holywell reservoir	0.0	SW	N									
08/0563	Taw Marsh boreholes	0.0	GW	N									
08/0713	River Taw, Newbridge	0.0	SW	N									
08/0725	Spreycott stream	0.0	SW	N									
09/0056	West Ilkerton river	1.1	SW	N									
09/0057	Slade reservoir	1.6	SW	N									
Page Sub-Total =		132.5	*Source Type: GW = Groundwater; SW = Surface Water.						Page 2 of 7				

** Four week peak yield

Table 8.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: South West							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield** (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
07/0186	Jennetts reservoir	0.0	SW	N	South West Water Services (Cont'd)	Roadford, N Devon & Plymouth (Contd)			
07/0187	River Yeo								
08/0536	River Yeo, Loxhore	6.4	SW	N					
08/0670	Bratton stream								
08/0694	River Bray, Leehamford	9.2	SW	N					
08/0695	Wistlandpound reservoir								
08/0696	Brockenburrow intake								
8/S/2	Upper Tamar Lake	6.3	SW	N					
42/G/14	Wheal Lucky adit + springs	0.0	GW	N					
Page Sub-Total =		21.9	*Source Type: GW = Groundwater; SW = Surface Water.					Page 3 of 7	

** Four week peak yield

Table 8.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: South West							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield** (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
2/S/31	Burrator reservoir	202.5	SW	N	South West Water Services (Cont'd)	Roadford, N Devon & Plymouth (Contd)		
2/S/32	Devonport leat, Dousland intake							
2/S/33	River Meavy, Stanlake intake							
04/0555	Devonport leat							
04/0558	W.Dart/Cowsic/Blackbrook- drain to Devonport Leat							
13/S/20	River Tamer, Gunnislake							
41/S/39	River Tavy, Lopwell							
52/S/6	Roadford reservoir	4.9	SW	N				
1/S 25	River Yealm/Broadall lake/ Fordbrook							
06 0074	Erme intake/Red lake/Left lake							
06 0075	Butterbrook reservoir	0.0	GW	N				
03/0599	Chagford springs							
03 0605	Mylor borehole							
03 0762	Brixham spring							
04 0541	Halsanger springs							
04 0542	Old mill reservoir, Dartmouth							
04 0546	Brockhill Mire + Lambsdown springs							
Page Sub-Total =		207.4	*Source Type: GW = Groundwater; SW = Surface Water.					Page 4 of 7

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Four week peak yield

Table 8.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: South West							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield** (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
04 0572	Littlehempston radial collector and boreholes	39.9	GW	N	South West Water Services (Cont'd)	Roadford, N Devon & Plymouth (Contd)			
04 0586	River Dart		SW						
02 1921	Thorns intake	1.9	SW	N					
02 2139	Duckaller borehole (+ compen.bh)								
02 2301	Vennbridge borehole (+ compen.bh)								
03 0614	Fernworthy reservoir	14.2	SW	N					
03 0615	Kennick, Tottiford + Trenchford res								
04 0651	Swincombe Intake	8.20	SW	N					
04 0652	Venford reservoir								
05 0114	Avon reservoir	12.4	SW	N					
05 0115	Bala brook intake								
Page Sub-Total =		76.6	*Source Type: GW = Groundwater; SW = Surface Water.					Page 5 of 7	

** Four week peak yield

Table 8.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY				
NRA REGION: South West							DATE: APRIL 1994				
Licence Number	Source Name/Location	Yield** (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment				
01 0414	Greatwell 4b borehole	10.0	GW	N	South West Water Services (Cont'd)	Wimbleball, East Devon					
01 0426	Greatwell boreholes										
01 0505	Greatwell No 5 borehole										
01 0478	Colaton Raleigh boreholes 2 & 4	15.7	GW	N							
01 0518	Harpford boreholes										
01 0519	Dotton boreholes										
01 0520	Dotton boreholes										
00 0669	Wilmington springs	1.1	GW	N							
00 0676	Hook springs + Cotley springs	1.7	GW	N							
00 0677	Couchill springs	0.3	GW	N							
00 0678	Holyford ponds	0.9	GW	N							
00 0679	Bovey Lane boreholes	0.8	GW	N							
00 0790	Pinhay springs	2.1	GW	N							
00 0835	River Axe, Whitford bridge	0.0	SW	N							
01 0417	St Cyres spring	0.0	GW	N							
01 0418	Sidford 3 borehole	0.0	GW	N							
01 0425	Kersbrook springs	1.0	GW	N							
Page Sub-Total =		33.6	*Source Type: GW = Groundwater; SW = Surface Water.					Page 6 of 7			

** Four week peak yield

Table 8.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: South West							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield** (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
01 0422	A Squabmoor res + Yettington intakes	0.90	SW	N	South West Water Services (Cont'd)	Wimbleball East Devon (Contd)		
01 0494	A Budleigh brook							
01 0544	Otterton 1a and 4 boreholes	4.0	GW	N				
02 1861	River Exe, North Bridge intake	60.4	SW	N		Wimbleball Allers & Pynes		
02 2019	River Exe, North Bridge							
02 2336	Bolham leat							
02 2101	Pynes leat							
02 0083	Aller springs	0.0	GW	N				
02 1825	Brampford Speke borehole	0.0	GW	N				
02 1863	Stoke Canon borehole	0.0	GW	N				
02 1881	Sheldon springs	0.6	GW	N				
02 1894	Uton borehole	1.0	GW	N				
02 2314	Coleford borehole	0.0	GW	N				
02 2332	Knowle borehole	0.0	GW	N				
08 0537	Clannaborough Adit	0.4	GW	N				
	WATER COMPANY TOTAL	605.9						
	Page Sub-Total =	67.3						
	OVERALL TOTAL =	605.9	*Source Type: GW = Groundwater; SW = Surface Water.				Page 7 of 7	

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Four week peak yield

Table 8.2

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		INTER-REGIONAL TRANSFERS		NATIONAL RIVERS AUTHORITY	
NRA REGION: South West				DATE: APRIL 1994	
From (NRA region)	To (NRA region)	Source	Volume (Ml/d)	Comment	
South West	Wessex	Wimbleball Reservoir	-32		
South West	Wessex	Shepherd Shore	-1.4		
TOTAL			-37.5		
				Page 1 of 1	

Table 8.3

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		POTENTIAL FUTURE REGIONAL DEVELOPMENTS				NATIONAL RIVERS AUTHORITY	
NRA REGION: South West						DATE: APRIL 1994	
Line No	Development Name	Source* Type	Yield (Ml/d)	Yield Est. Agreed with Undertaker (Y/N)	Comment	Status and Class	
1	Wimbleball Pumped storage	SW	30	y	Assumes a 10 Ml/d transfer to Wessex	4	A
2	Roadford Pumped storage	SW	50	N		1	D
3	Colliford Pumped storage	SW	30	N		1	D
						</	

Table 8.4

South West Region					
Development Date	1993	2001	2011	2021 incl Class D schemes	2021 excl Class D schemes
Existing Source Yield (MI/d)	606	606	606	606	606
Possible Yield Cutbacks (MI/d)	0	0	0	0	0
Potential Future Schemes (MI/d)	0	+30	+30	+110	+30
TOTAL	+606	+636	636	716	636

Table 9.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
28/39/27/33	Chertsey	22.0			North Surrey Water Company			
28/39/30/64	Clandon	1.24						
28/39/30/65	West Horsley	0.68						
28/39/M/6A	Egham	131.0	SW				A further 47 MI/d of yield from the Egham source is transferred to Mid Southern Water Company	
28/39/M/6A	Chertsey							
28/39/M/6A	Walton							
Intra-regional transfer	Kempton	24.0	SW				Intra-regional transfer from TWU	
Intra-regional transfer	Ladymead, Dapdune & Millmead	2.27	GW				Intra-regional transfer from TWU	
	WATER COMPANY TOTAL	181.19						
					</			

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Thames							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
IMPORTS	Tatsfield	7	GW		East Surrey Water plc		Imports from NRA Southern Region		
	Westwood								
	Bough Beech	30.0	SW						
	Paines Hill	1.0	GW						
	Warwick Wold & Brewer Street	9.0	GW						
	North Park, Flower Lane & Duckpit Wood								
28/39/41/36D	Smitham	27.0	GW						
38/39/41/37D	Kenley & Purley								
28/39/32/29	Buckland & the Clears	3.0	GW						
28/39/32/32C	Leatherhead		GW						
28/39/32/59C(N)	Leatherhead	40.0	GW						
28/39/32/30B	Fetcham	8.0	SW						
28/39/32/31B			GW						
28/39/32/33	Dorking	8.0	GW						
28/39/32/67C(N)	Leatherhead		GW						
	WATER COMPANY TOTAL	133.0							
	Page Sub-Total =	133.0	*Source Type: GW = Groundwater; SW = Surface Water.					Page 2 of 24	

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
28/39/40/8A	Sutton	36.0	GW		Sutton District Water plc			
	Nonsuch Park							
	Langley Park							
	Cheam							
	Secombe Centre							
28/39/41/27B	Oaks	9.0	GW					
28/39/M/5B	Woodcote							
28/39/M/5C	Holly Lane	24.0	GW					
28/39/M/5C	Perrotts Farm							
28/39/41/28C	Woodmansterne							
	WATER COMPANY TOTAL	69.0						
Page Sub-Total =		69.0	*Source Type: GW = Groundwater; SW = Surface Water.					Page 3 of 24

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Thames							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
IMPORTS	Greatham	6.27			Mid Southern Water Company		Imports from NRA Southern Region		
	Woodgarston	6.81							
	Hawkley	1.10							
	East Meon	0.86							
	Sheet	5.21							
	Oakshott Springs								
28/39/30/77	Tilford Meads	7.09	GW						
28/39/26/58	Cookham	15.0	GW						
28/39/26/60D	Hurley	29.53	GW						
28/39/26/76D									
28/39/26/114	Bray	45.0	SW						
28/39/24/108	Greywell	6.84	GW						
28/39/24/265B	West Ham, Hants	21.14	GW						
38/39/34/110B									
28/39/30/76	Headley Park	9.1	GW						
28/39/26/87	Bray (gravels)	17.2	GW						
28/39/26/59	College Ave	18.68	GW						
28/39/24/112C	Boxalls	13.14	GW						
28/39/34/113C									
28/39/30/73	Oakhanger	4.96	GW						
28/39/30/273	Lasham	14.95	GW						
	Page Sub-Total =	222.88	*Source Type: GW = Groundwater; SW = Surface Water.					Page 4 of 24	

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
28/39/24/107	Itchell	4.34	GW		Mid Southern Water Company (Cont'd)			
28/39/30/78G	Britty Hill	4.92	GW					
28/39/30/302G								
28/39/30/79	Tower	0.0	GW					
28/39/30/74	Woodhanger	0.0	GW					
28/39/24/160	Cliddesden	0.53	GW					
28/39/30/257	Hindhead & Tower	0.47	GW					
28/39/30/222	Windmill & Weyspring	4.55	GW				Subject to ALF proposals	
28/39/24/111	Tongham	2.24	GW					
28/39/30/228	The Bourne	3.73	GW					
28/39/24/106A	Toutley	4.16	GW					
28/39/24/109A	Beenham's Heath							
28/39/30/303	Rushmoor	4.17	GW					
28/39/30/71	Tilford	4.23	GW					
28/39/30/72	Hindhead	0.0	GW					
Intra-regional transfer	Egham	47.0	SW				Intra-regional transfer from North Surrey Water Company	
	WATER COMPANY TOTAL	303.22						
	Page Sub-Total =	80.34	*Source Type: GW = Groundwater; SW = Surface Water.					Page 5 of 24

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
28/39/27/64	Sunnymeads	71.6	SW		Three Valleys Water Services	Colne		
28/39/28/270	The Grove & Waterford Field	20.0	GW				Aggregated sources	
28/39/28/336B	Poors Field	0.0						
28/39/28/336B	Netherwild	28.5						
28/39/28/336B	Eastbury	25.4						
28/39/28/336B	Bricketwood	18.2						
28/39/28/336B	Wall Hall	17.0						
28/39/28/336B	Bushey	10.6						
28/39/28/336B	Berrygrove	6.6						
28/39/28/336B	Ruislip	0.0						
28/39/28/336B	Northwood	0.0						
28/39/28/336B	Tolpits	0.7						
28/39/28/337A	Shakespeare Rd	1.4						
28/39/28/337A	Redbourne	1.2						
28/39/28/337A	Hollywell	7.7						
28/39/28/337A	Stonecross	2.6						
28/39/28/337A	Mud Lane	9.5						
28/39/28/339B	Bushey Hall	9.3						
29/38/1/40D	Wheathampstead	3.1	GW					
29/38/1/41D	East Hyde	2.5						
Page Sub-Total =		235.9	*Source Type: GW = Groundwater; SW = Surface Water.					Page 6 of 24

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
IMPORTS	Dunmow	1.2	GW		Three Valleys Water Services (Cont'd)	Lee	Imports from NRA Anglian Region	
	Slip End	0.0	SW				3 Valleys have an entitlement to increase this import to 136 MI/d by 2001	
	Grafham	91.0						
	Offley Bottom	1.14						GW
	Oughton Head	4.54						
	Hempstead	1.5						
	Debden Road	3.41						
	Temple End	4.54						
	Well Head	2.27						
	Newport	1.0						
	Thaxted	1.2						
	Wenden	2.3						
	Therfield	3.41						
Armitage BR	1.1							
28/39/27/64	Sunnymeads	42.0	SW					
28/39/28/130G	Friars Wash	15.9	GW			Subject to ALF proposals		
28/39/2//130G	Kemsworth Lynch	6.8						
28/39/28/130G	Bow Bridge	5.7						
Page Sub-Total =		189.01	*Source Type: GW = Groundwater; SW = Surface Water.				Page 7 of 24	

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Mi/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
28/39/28/225	North Mymms	6.0	GW		Three Valleys Water Services (Cont'd)	Lee		
28/39/28/226A	Roestock	8.6	GW					
28/39/28/226A	Tyttenhanger	6.8						
29/38/1/61A	Hatfield (Roe Green)	7.7						
29/38/1/10	Runley Wood	0.0	GW					
29/38/1/11	Periwinkle Lane	4.2	GW					
29/38/1/60	Essendon	9.09	GW					
29/38/1/62	Water Hall	1.09	GW					
29/38/1/67H	Albert Road	24.0	GW					
29/38/1/8H	Crescent Road							
29/38/1/9	Runley Wood	6.8	GW					
29/38/2/20	School Lane	0.5	GW					
29/38/2/45	Codicote	0.65	GW					
29/38/2/46B	Digswell	6.9	GW					
29/38/2/47B	Fulling Mill	9.09						
29/38/2/73B								
29/38/2/70	Kings Walden	1.8	GW					
29/38/3/1C	Watton Road	0.5	GW					
29/38/3/43C	Whitehall	22.23						
29/38/3/37	Aston	1.7	GW					
Page Sub-Total =		117.65	*Source Type: GW = Groundwater; SW = Surface Water.					
								Page 8 of 24

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
29/38/3/38	Broomin Green	0.0	GW		Three Valleys Water Services (Cont'd)	Lee		
29/38/3/41E	Sacombe	11.0	GW					
29/38/4/35E	Thundridge	9.09						
29/38/5/17E	Hadham Hill	1.8						
29/38/3/47	Molewood	0.9	GW					
29/38/3/52	Porthill	1.9	GW					
29/38/4/33	Chipping	2.3	GW					
29/38/4/34	Standon	3.6	GW					
29/38/4/36	Wadesmill	5.9	GW					
29/38/4/55	Hare Street	1.36	GW					
29/38/6/2K	North Stortford	5.8	GW					
29/38/6/3K	Stanstead	1.3						
29/38/6/93	Causeway	1.9	GW					
29/38/6/95	Roydon	8.7	GW					
29/38/6/96	Redricks Lane	4.4	GW					
29/38/6/97	Stanstead	1.3	GW					
29/38/7/33	Musley Lane	3.0	GW					
29/38/8/169	Northaw	0.4	GW					
Page Sub-Total =		64.65	*Source Type: GW = Groundwater; SW = Surface Water.					Page 9 of 24

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Thames							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
29/38/9/101	East Barnet	0.0	GW		Three Valleys Water Services (Cont'd)	Lee			
IMPORTS	Uttlesford	6.0	GW				Imports from NRA Anglian Region		
	Springwell								
	Baldock Road	10.0	GW						
	William Road								
	Queens Road	1.2	GW						
	Londons Road								
Intra-regional transfer	Fortis Green	6.0	SW				Intra-regional transfer from TWU		
	Page Sub-Total =	23.2	*Source Type: GW = Groundwater; SW = Surface Water.					Page 10 of 24	

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Thames							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
28/39/25/47	Hughenden	2.27	GW		Three Valleys Water Services (Cont'd)	Rickmansworth			
28/39/28/334A	Great Missenden	5.68	GW				Subject to ALF proposals		
28/39/28/334A	Bulstrode	2.2							
28/39/28/334A	Chafont St Giles	3.0							
28/39/28/334A	Amersham	13.0							
28/39/28/334A	Gerrards Cross	5.6					Subject to ALF proposals		
28/39/28/335B	Little Gaddesden	0.54	GW						
28/39/28/335B	Berkhampstead	7.95							
28/39/28/335B	Hunton Bridge	7.2							
28/39/28/335B	Chartridge	0.72							
28/39/28/335B	Piccotts End	18.0							
28/39/28/335B	Marlowes	1.0							
28/39/28/104	Alma Road	5.2	GW						
28/39/28/480C	Chorley Wood	8.8	GW						
28/39/28/480C	Batchworth	18.3	GW						
28/39/28/480C	Mill End	10.6	GW						
28/39/28/480C	Stockers	7.27	GW						
28/39/28/480C	Springwell	0.0	GW						
28/39/28/480C	West Hyde	8.9	GW						
Page Sub-Total =		126.23	*Source Type: GW = Groundwater; SW = Surface Water.					Page 11 of 24	

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
28/39/28/480C	Northmoor	9.7	GW		Three Valley Water Services (Cont'd)	Rickmansworth		
28/39/28/480C	Blackford	6.8						
28/39/28/480C	Ickenham	9.7						
28/39/39/27/64	Sunnymeads	113.6						
	WATER COMPANY TOTAL	896.44						
Page Sub-Total =		139.80	*Source Type: GW = Groundwater; SW = Surface Water.					Page 12 of 24

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
28/39/14/234	R Thames, Bodicote	4.55	SW		Thames Water Utilities	Banbury	To be returned to service - yield to be assessed	
28/39/14/240	R Thames, Grimsbury	6.5	SW					
IMPORT	Brockley	3.2	GW			Cotswold	Import from NRA Severn Trent Region	
28/39/10/30	Seven Springs	3.0	GW					
28/39/10/31D	Upper Swell	3.2	GW					
28/39/10/38D	Lower Swell							
28/39/2/18A	Baunton	6.3	GW					
28/39/2/63A								
2/39/6/13	Fairford	1.1	GW					
28/39/6/14C	Syreford	1.1	GW					
28/39/6/72C								
28/39/6/15B	Bibury	6.0	GW					
28/39/6/62B								
28/39/22/4411	Ashdown Park	2.0	GW			Faringdon		
28/39/22/811								
28/39/9/8	Broadwell Grove	0.0	GW					
28/39/12/25	Chalford Springs	0.9	GW		Oxford			
	Page Sub-Total =	37.85	*Source Type: GW = Groundwater; SW = Surface Water.					Page 13 of 24

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Thames							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
28/39/15/6	R Thames, Culham	0.0	SW		Thames Water Utilities (Cont'd)	Oxford	Emergency use		
28/39/15/53H	R Thames, Swinford & Kings Weir	129.5	SW				Buscott licence now transferred to Farmor licence		
28/39/16/54H	R Thames, Farmoor								
28/39/16/59H									
28/39/23/173	Gatehampton	55.0	GW			Swindon			
28/39/1/9	Ashton Keynes	8.6	GW						
28/39/22/27	Axford	9.3	GW						
28/39/22/75	Ogbourne	3.0	GW						
28/39/3/2	Wroughton	1.2	GW						
28/39/5/39F	Meysey Hampton	9.0	GW						
28/39/5/41F									
28/39/21/10	Latton	24.7	GW						
28/39/19/186L	Chinnor	4.4	GW				Watlington		
28/39/19/40L	Lewknor & Kingston Blount								
28/39/42L	Watlington								
28/39/19/90L	Britwell								
28/39/10/131G	R Thames, Worsham	11.36	SW			Witney			
28/39/10/40G									
Page Sub-Total =		256.06	*Source Type: GW = Groundwater; SW = Surface Water.					Page 14 of 24	

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
28/39/23/10	Harpsden	4.0	GW		Thames Water Utilities (Cont'd)	Henley Zone		
28/39/23/121	Witheridge Hall	1.8	GW					
28/39/23/134	Playhatch	4.0	GW					
28/39/23/60	Cleeve	12.0	GW					
28/39/23/9								
23/39/23/601	Grey's Road	4.0						
28/39/22/420G	Mariborough	1.5				Malborough		
28/39/22/55G								
28/39/22/56	Bedwyn	1.1	GW					
28/39/22/73H	Clatford	1.25	GW					
28/39/22/419H								
28/39/22/74	Ramsbury	1.25	GW					
28/39/21/9	Bradfield	1.6	GW			Newbury Zone		
28/39/22/33C	Bishops Green	12.0	GW					
28/39/22/35D	Chieveley	0.0	GW					
28/39/22/426D								
28/39/22/375E	Fognam Down	2.5	GW					
28/39/22/41E								
28/39/22/43	Cold Ash	1.0	GW					
Page Sub-Total =		48.0	*Source Type: GW = Groundwater; SW = Surface Water.					
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Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
28/39/22/44	Hungerford	1.6	GW		Thames Water Utilites (Cont'd)	Newbury Zone		
28/39/22/47	Speen	11.4	GW					
28/39/22/480C	East Woodhay	0.0	GW					
28/39/22/33C								
28/39/22/488	Leckhamstead	2.0						
28/39/22/435	Fobney	72.8	SW			Reading & Silchester		
28/39/21/7	Pangbourne	30.0	GW					
28/39/21/72	Theale	5.0	GW					
28/39/22/172B	Ufton Nervet	10.0	GW					
28/39/22/415B								
28/39/22/32	Mortimer	3.0	GW					
28/39/24/20	Sheeplands	18.2	GW					
28/39/18/6	Hendred	0.5	GW					
28/39/20/10	Aston Tirrold	1.3	GW			South Oxfordshire		
28/39/20/11F	Woods Farm	1.8	GW					
28/39/20/38F								
28/39/20/4	Upton	1.2	GW					
28/39/20/5	Cholsey	0.3	GW					
28/39/20/6	Blewbury	0.0	GW					
28/39/20/8	West Hagbourne	0.50	GW					
Page Sub-Total =		159.60	*Source Type: GW = Groundwater; SW = Surface Water.					Page 16 of 24

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames - Kennet/Reading Reliable Yields							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
28/39/21/3	Compton	5.0	GW		Thames Water Utilities (Cont'd)	South Oxfordshire	River Pang ALF Scheme : Reduced from 13.6 MI/d licence	
28/39/23/173	Gatehampton	15.0	GW					
28/39/24/14	Aborefield	0.0	GW					
28/39/17/22	Childrey Warren	3.5	GW			Wantage	ALF Scheme but no reduction in yield	
28/39/17/6	Manor Road	2.5	GW					
Page Sub-Total =		26.0	*Source Type: GW = Groundwater; SW = Surface Water.					Page 17 of 24

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY			
NRA REGION: Thames							DATE: APRIL 1994			
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment			
28/39/19/104	Dancers End	1.0	GW		Thames Water Utilities (Cont'd)	Aylesbury				
28/39/28/238A	Hampden	3.41	GW				Subject to ALF proposals			
28/39/28/238A	Wendover	4.2	GW				Subject to ALF proposals			
28/39/28/238A	New Ground	6.36	GW							
28/39/28/238AA	Hawridge	7.0	GW							
28/39/28/394AA										
28/39/26/109	Taplow	35.0	GW				Slough			
28/39/27/23	Burnham	3.0	GW							
28/39/27/3	Datchet	15.0	GW							
28/39/27/92	Eton	3.5	GW							
28/39/27/97	Dorney	15.0	GW				Wycombe			
28/39/23/110	Medmenham	35.0	GW							
28/39/23/67	Marlow	5.5	GW							
28/39/23/69B	Bourne End	20.0	GW							
28/39/23/7B			GW							
28/39/25/42	Pann Mill	17.0	GW							
28/39/25/44D	Mill End	17.0	GW							
38/39/25/55D										
28/39/25/43C	Bennetts End	2.0	GW							
28/39/25/51C	Radnage									
Page Sub-Total =		189.97	*Source Type: GW = Groundwater; SW = Surface Water.					Page 18 of 24		

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
28/39/30/289	Cotterells Farm, Albury & Shere Heath	6.0	GW		Thames Water Utilities (Cont'd)	Guildford		
28/39/30/319	Shalford	30.0	SW					
28/39/30/66								
28/39/30/86	Sturt Road	2.5	GW					
28/39/30/88	Netley Mill	4.6	GW					
28/39/30/89	Mousehill & Rodborough	5.0	GW					
28/39/30/89	Rodborough							
28/39/30/92	Ladymead, Dapdune & Millmead	18.23	GW				A further 2.27 MI/d of yield from this source is transferred to North Surrey Water Company	
Intra-regional transfer	Haselmere	0.8	GW				Intra-regional transfer from Mid Southern Water Company	
	Page Sub-Total =	67.13	*Source Type: GW = Groundwater; SW = Surface Water.					Page 19 of 24

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
28/39/33/12G	Epsom (Nonsuch)	0.5	GW		Thames Water Utilities (Cont'd)	Central		
28/39/33/15G	Epsom (Langley Vale)	4.56	GW					
28/39/33/8G	Epsom (Pt A)	10.0	GW					
28/39/33/8G	Epsom (Pt B)							
28/39/41/10G	Surrey St	15.0	GW					
28/39/41/11G	Selhurst	1.5	GW					
28/39/41/12	Waddon	7.59	GW					
28/39/41/39D	Merton Abbey & Streatham	3.5	GW					
28/39/43/15D	West Wickham	7.58	GW					
28/39/43/16D	Honor Oak	2.2	GW					
28/39/43/17E	Jewels Wood	0.0	GW					
28/39/43/18D	Shortlands	17.12	GW					
28/39/43/19D	Deptford	22.82	GW					
28/39/43/5G	Stroud Green	1.4	GW					
28/39/43/6G	Addington	6.73	GW					
28/39/M/2† (part)	R Thames between Datchet & Hampton	1596.72 (total)	SW				Lower Thames Reservoir intakes, controlled by operating agreement. See also New Gauge & Chingford	
IMPORT	Wilmington (9/40/1/118E)	15.0	GW		Import from NRA Southern Region			
IMPORT	Westerham (9/40/1/119E)	1.1	GW		Import from NRA Southern Region			
Page Sub-Total =		1713.32	*Source Type: GW = Groundwater; SW = Surface Water.					Page 20 of 24

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
IMPORTS	Green St. Green (9/40/1/120E)	4.2			Thames Water Utilities (Cont'd)	Central	Imports from NRA Southern Region	
	Horton Kirby (9/40/1/121E)	13.0						
	Lullingstone (9/40/1/122E)	6.0						
	Sundridge (9/40/1/23E)	12.4						
	North Orpington (9/40/1/124F)	7.6						
	Eynsford (9/40/1/125E)	12.0						
	Wansunt (9/40/1/126F)	15.0						
	Orpington (9/40/1/127F)	1.5						
	Crayford (9/40/1/129F)	1.4						
	Bexley P. (9/40/1/130F)	6.73						
	Brasted (9/40/1/131E)	2.75						
	Dartford (9/40/1/132E)	3.3						
	Darenth (9/40/1/133E)	20.0						
29/38/7/34I	Amwell End	3.9				Lee		
29/38/7/35I	Amwell Hill	9.3						
29/38/7/36I	Amwell Marsh	2.0						
29/38/7/37I	Broadmead	5.2						
29/38/7/38I	Chadwell Spring	0.0						
29/38/7/39† (part)	New Gauge (S)	{1596.72} (total)					River Thames source. See also Datchet/Hampton & Chingford	
Page Sub-Total =		126.28	*Source Type: GW = Groundwater; SW = Surface Water.					Page 21 of 24

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
29/38/7/42H	Middlefield Road	0.0	GW		Thames Water Utilities (Cont'd)	Lee		
29/38/7/49H	Rye Common	15.0	GW					
29/38/8/170H	Broxbourne	14.5	GW					
29/38/8/172J	Darnicle Hill	0.0	GW					
29/38/8/173I	Hoddesdon	16.5	GW					
29/38/8/178I	Turnford	8.9	GW					
29/38/8/194† (part)	Chingford + other Lee intakes	[1596.72] (total)	SW				Lee Valley Reservoir Intakes from R Thames. See also Datchet/Hampton and New Gauge	
29/38/8/215J	Lea Bridge	4.3	GW				Aggregated sources	
29/38/8/215J	Park	2.6						
29/38/8/215J	Chingford Mill	4.0						
29/38/8/215J	Waltham Abbey	5.5						
29/38/8/215J	Ponders End	5.0						
29/38/8/215J	Coppermills	8.0						
29/38/8/216K	Greaves Pumping Station	6.0	GW				Lee Valley Artificial Recharge Scheme	
29/38/8/216K	Warwick Reservoir	10.0						
29/38/8/216K	Flanders Weir	4.0						
29/38/8/216K	King George Reservoir	2.5						
29/38/8/216K	Lockwood Reservoir	7.0						
29/38/8/216K	Chingford South	3.5						
	Page Sub-Total =	117.3	*Source Type: GW = Groundwater; SW = Surface Water.					Page 22 of 24

Table 9.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
29/38/8/216K	Sewardstone Road	2.6	GW		Thames Water Utilities (Cont'd)	Lee	Lee Valley Artificial Recharge Scheme)	
29/38/89/108J	Hadley Road	2.6	GW					
29/38/9/110I	Hornsey (Campbourne Well)	0.0	GW					
29/38/9/127J	Hoe Lane	2.0	GW					
8/37/87/24J	East Ham	2.0	GW					
8/37/54/25J	Wanstead	3.9	GW					
	WATER COMPANY TOTAL	2754.61						
							</	

† River Thames sources used conjunctively. Total reliable yield = 1596.72 Ml/d

Table 9.1 continued[illegible]

Table 9.2

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		INTER-REGIONAL TRANSFERS			NATIONAL RIVERS AUTHORITY
NRA REGION: Thames					DATE: APRIL 1994
From (NRA region)	To (NRA region)	Source	Volume (Ml/d)	Comment	
Thames	Severn Trent	Upper Thames (Cotswold Springs)	-1.5		
Thames	Anglian	Lee Valley Reservoir/London Ring Main	-91		
Thames	Wessex	Shepherd Shore	-3.6		
Sub-Total			-96.1		
Southern	Thames	Paines, Tatsfield, Wetwood Boreholes	+8		
Southern	Thames	North Park, Flower, Duckpit Boreholes	+4		
Southern	Thames	OakshotT, Meon, Hawkley, Sheet, Greatham, Woodgarston Boreholes	+20.3		
Southern	Thames	Bough Beech Reservoir	+30		
Anglian	Thames	Various Chalk Boreholes	+45		
Anglian	Thames	Grafham	+91	Programmed to increase to +136Ml/d in 2001	
Severn Trent	Thames	Brockley	+3.2		
Sub-Total			+201.5	Programmed to increase to +246.5 Ml/d in 2001	
TOTAL			+105.4	Programmed to increase to +150.4 Ml/d in 2001	
Page 1 of 1					

Table 9.3

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		POTENTIAL FUTURE REGIONAL DEVELOPMENTS				NATIONAL RIVERS AUTHORITY	
NRA REGION: Thames						DATE: APRIL 1994	
Line No	Development Name	Source* Type	Yield (Ml/d)	Yield Est. Agreed with Undertaker (Y/N)	Comment	Status and Class	
1	Artificial Recharge N London	GW	90	Y	Under development	3	B
2	Artificial Recharge S London	GW	90	Y	Under investigation	3	C
3	Rising GW London	GW	30	Y	Under investigation	3	C
4	Increased supply from Gratham	SW	45	Y		1	A
5	Thames-side GW - Harpsden	GW	10	Y	Under investigation	3	C
6	Thames-side GW - Reading	GW	20	Y	Under Investigation	3	C
7	Thames-side GW - Remenham	GW	10	Y	Under Investigation	3	C
8	Thames-side GW - West Mollow	GW	10	Y	Under Investigation	3	C
TOTAL			305	* Source Type: GW = Groundwater, SW = Surfacewater			Page 1 of 1

Table 9.4

Thames Region				
Development Date	1993	2001	2011	2021
Existing Source Yield (MI/d)	4337	4337	4337	4337
Possible yield Cutbacks (MI/d)	0	-67	-67	-67
Potential Future Schemes (MI/d)	0	135	305	305
TOTAL	4337	4405	4575	4575

Table 10.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Welsh							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
67-9-3	Dee-Barrelwell Hill, Chester	34.1	SW	Y	Chester Waterworks Company		Susceptable to saline intrusion over Chester weir	
	Plumstall Boreholes	2.2	GW	Y				
	WATER COMPANY TOTAL	36.3						

Table 10.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Welsh							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
67-7-5	Dee-Twll, Bangor-is-y-Coed	40.91	SW	Y	Wrexham & E Denbighshire Water Company		Combined licence	
67-7-182	R Dee at Bangor							
67-7-36	Ty Mawr & Cae Llwyd Reservoirs	3.41	SW	Y				
67-7-35	Park Day Level/Speedwell Shaft	2.50	GW	Y			Poor quality and implicated as an ALF site	
67-8-10	Pendinas Reservoir & Llyn Cyfynwy	2.27	SW	Y				
67-5-3	Penycae Reservoir	2.18	SW	Y				
67-5-2	Trefnant Brook	0.15	SW	Y				
65-5-7	Vivod	0.90	SW	Y				
67-5-24	Newhall Spring	0.15	SW	Y				
67-6-33	Tregeiriog	0.06	SW	Y				
67-7-37	Talwrn Borehole	1.00	GW	Y				
67-8-3	Nant-y-frith Reservoir	0.80	SW	Y				
	WATER COMPANY TOTAL	54.33						
	Page Sub-Total =	54.33	*Source Type: GW = Groundwater; SW = Surface Water.				Page 2 of 8	

Table 10.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Welsh							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
56-13-17	Llandegfedd Reservoir	234.00	SW	Y	Dwr Cymru - Welsh Water	South East	Inc Llantrisant intake & Usk reg.storage	
55-18-408	R Wye - Monmouth intake	125.00	SW	Y		South East	Supported by Elan Rd	
57-21-2	Taf Fechan Reservoirs	70.50	SW	Y		South East		
57-21-1	Taf Fawr Reservoirs	46.00	SW	Y		South East		
56-41-7	Talybont Reservoir	46.00	SW	Y		South East		
55-15-246	R Wye at Broomy Hill	44.70	SW	Y		South East		
57-24-1/4/7	Llyn Fawr Res & Upper Rhondda sources	7.30	SW	Y		South East		
56-65-14	Shon Sheffrey Reservoir	5.20	SW	Y		South East		
57-24-25	Castell Nos and Lliest Wen Reservoirs	11.00	SW	Y		South East		
57-23-2/5	57-23-48/49/50 Bwlfa and Nanty Moel sources	2.00	SW	Y		South East	Yield figure is for licence No 57-23-2	
55-21-108	Great Spring well shaft	10.90	GW	Y		South East	Industrial supply	
56-34-18	Grwyne Fawr Reservoir & Grwyne Springs	6.90	SW	Y		South East		
56-64-3	Upper and Lower Carno Reservoirs	5.20	SW	Y		South East		
57-11-1	Rhumney Bridge Reservoirs	3.80	SW	Y		South East		
56-72-18	Wentwood Reservoir	4.00	SW	Y		South East		
57-12-33	Streams to Lisvane Storage Reservoir	5.50	SW	Y		South East	Industrial supply	
56-63-11	Cwmteillery Reservoir	2.00	SW	Y		South East		
56-65-13	Conduit at Argoed	2.00	SW	Y	South East			
Page Sub-Total =		632	*Source Type: GW = Groundwater; SW = Surface Water.				Page 3 of 8	

Table 10.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY;	
NRA REGION: Welsh							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
57-25-1/2	Clydach and Perthcelyn Reservoirs	2.90	SW	Y	Dwr Cymru - Welsh Water (Cont'd)	South East		
56-11-5	Pant-yr-Eos, Henllys Brooks & Ynysyfro Reservoir	1.50	SW	Y		South East		
56-11-7	Pant-yr-Eos Reservoir & springs	2.00	SW	Y		South East		
55-6-76	R Wye & Llan-Bwch-Llyn Lake	3.60	SW	Y		South East		
55-17-451	Vowchurch boreholes	3.00	GW	Y		South East		
55-8-179	Four boreholes	3.80	GW	Y		South East		
56-33-4	Ffynnon Gistaen Springs	2.40	SW	Y		South East		
56-12-51	Four intake chambers to Penrheol Res	2.00	SW	Y		South East		
55-3-38	R Wye at Builth	3.70	SW	Y		South East		
55-18-220	Coughton boreholes	3.60	GW	Y		South East		
56-44-16	Boreholes at Brecon	5.80	GW	Y		South East	Includes R Usk at Brecon	
55-18-201	R Wye	3.40	SW	Y		South East		
55-21-56	Rogerstone Grange borehole	3.40	GW	Y		South East		
55-9-330	Dunfield boreholes	3.30	GW	Y		South East		
55-12-431	Well at Mid Summer Meadow, Leominster	3.30	GW	Y		South East		
60-3-35	Tywi at Nantgaredig	227.30	SW	Y		South West		
61-4-10	Llysyfran Reservoir at Canaston Bridge intake	57.70	SW	Y	South West	After 1992 raising of the dam		
56-53-2	Cray Reservoir	20.40	SW	Y	South West			
Page Sub-Total =		353.1	*Source Type: GW = Groundwater; SW = Surface Water.				Page 4 of 8	

Table 10.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Welsh							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
60-1-68	Tywi - Manorafon abstraction	36.40	SW	Y	Dwr Cymru - Welsh Water (Cont'd)	South West		
56-54-1	Usk Reservoir	12.70	SW	Y		South West		
58-44-6	Schwyl PS	21.80	GW	Y		South West		
61-3-1	W Cleddau at Crowhill	10.00	SW	Y		South West	Part of Pembs conj. use	
59-4-65	Lliw Reservoirs	10.30	SW	Y		South West		
58-71-1	Ystradfellte Reservoir	15.20	SW	Y		South West		
59-3-22	Cwn Lledi Reservoir	4.40	SW	Y		South West	Industrial supply	
59-3-23	Upper Lledi Reservoir	6.50	SW	Y		South West		
61-4-1	Prescelly No 1 Reservoir	7.40	SW	Y		South West	Includes Pont Hywel (licence No 61-4-3)	
62-3-5	Teifi at Llechryd	19.00	SW	Y		South West		
60-1-1	Llynfan Reservoir	4.00	SW	Y		South West		
62-1-57	Teifi Pools	6.70	SW	Y		South West		
59-2-50	Headwaters of Loughor	6.80	SSW	Y		South West	WTW constraint	
58-11-2	Biglis Wells	5.00		Y		South West		
63-1-29	Parcel Ganol borehole - Lovesgrove	2.90	GW	Y		South West		
66-10-1/2	Llyn Cowlyd, Llyn Dulyn & Melynllyn	34.20	SW	Y		North West		
106-6-6	Alaw Reservoir, Rhos-y-Bol, Ynys Mon	23.70	SW	Y		North West		
65-15-18	Afon Gwyfrai at Llyn Cwellyn & Nant Mill	12.00	SW	Y		North West		
Page Sub-Total =		239	*Source Type: GW = Groundwater; SW = Surface Water.				Page 5 of 8	

Table 10.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Welsh							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
102-2-7	Cefni Reservoir	10.00	SW	Y	Dwr Cymru - Welsh Water (Cont'd)	North West		
66-6-7	Plas Uchaf and Dolwen Reservoirs	11.82	SW	Y		North West	Aled system yield	
65-8-19	Llyn Cwmystadrlllyn	12.70	SW	Y		North West	Includes Dolbenmaen (licence No 65-8-16)	
66-3-48	Llannerch Park Boreholes	13.60	GW	Y		North West		
66-8-10	Ffynnon Llugwy, Capel Curig	9.00	SW	Y		North West	Includes Marchlyn Bach (licence No 65-16-64)	
65-18-8	A Llafar & Cefnllusg & stream at Gwern Saeson Bach	1.10	SW	Y		North West		
64-12-1	Llyn-Craig-y-Pistyll	3.00	SW	Y		North West		
66-7-34	Ffynnon Asaph	1.90	SW	Y		North West		
66-1-1	Llyn Conwy	3.40	SW	Y		North West		
65-16-9	Afon RhythalIt, Llanrug, Caernarfon	3.40	SW	Y		North West		
67-4-16	Alwen Reservoir	35.50	SW	Y		North East		
67-9-148	Dee - Poulton, Chester	23.60	SW	Y		North East		
67-8-56	4 Reservoirs & Mill Pond at Cilcain, Mold	1.50	SW	Y		North East		
							</	

Table 10.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Welsh							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
55-18-375	R Wye at Lydbrook (Mitcheldean)	12.0	SW	Y	Dwr Cymru - Welsh Water (Cont'd)	South East	A further 33.3 Ml/d of yield from this source is exported to NRA Severn Trent Region	
	Various licenced sources <2 Ml/d	33.5				North West		
	Various licenced sources <2 Ml/d	29.2				North East		
	Various licenced sources <2 Ml/d	28.2				South West		
	Various licenced sources <2 Ml/d	70.5				South East		
Licence exempt area	Various small GW sources	14.5	GW					
	WATER COMPANY TOTAL	1542.52						
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Table 10.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Welsh							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
	WATER COMPANY TOTAL	36.3			Chester Waterworks Company			
	WATER COMPANY TOTAL	54.33			Wrexham & East Denbighshire Water Company			
	WATER COMPANY TOTAL	1542.52			Dwr Cymru Welsh Water			

Table 10.2

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		INTER - REGIONAL TRANSFERS			NATIONAL RIVERS AUTHORITY	
NRA REGION: Welsh					DATE: APRIL 1994	
From (NRA region)	To (NRA region)	Source	Volume (Ml/d)	Comment		
Welsh	Severn Trent	Elan Valley Reservoirs	-327	Welsh figure/ST figure - to be resolved		
Welsh	Severn Trent	River Wye, Mitcheldean	-33.3			
Welsh	Severn Trent	Forest of Dean GW	-11.6			
Welsh	North West	River Dee (Nantwich)	-50			
Welsh	North West	River Dee	-635	Welsh figure/NW figure - to be resolved		
Sub-Total			-1056.9			
Severn Trent	Welsh	Leintwardine GW	+0.8			
Severn Trent	Welsh	Whitbourne	+9			
North West	Welsh	Plemstall	+2			
Sub-Total			+ 11.8			
TOTAL			-1045.1			
Page 1 of 1						

Table 10.3

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		POTENTIAL FUTURE REGIONAL DEVELOPMENTS				NATIONAL RIVERS AUTHORITY	
NRA REGION: Welsh						DATE: APRIL 1994	
Line No	Development Name	Source* Type	Yield (MI/d)	Yield Est. Agreed with Undertaker (Y/N)	Comment	Status and Class	
1	Local supplies in Hereford & Radnor	GW/SW	20	Y		1	B
2	Local supplies in N Dyfed area	GW/SW	10	Y		1	B
3	Local supplies in Merionnydd	GW	20	Y		1	B
4	Llyn Celyn	SW	20	Y	Spillway Improvements	1	B
5	Dee Developments	SW	10			1	B
6	Dee Developments	SW	11			1	B
7	Brianne Phase II	SW	127	Y	Spillway raising - maximum yield	2	D

Table 10.4

Welsh Region				
Development Date	1993	2001	2011	2021
Existing Source Yield (MI/d)	1633	1633	1633	1633
Possible yield Cutbacks (MI/d)	124.6	124.6	124.6	124.6
Potential Future Schemes (MI/d)	0	91	91	218
TOTAL	1508.4	1599.4	1599.4	1726.4

Table 11.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Wessex							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
13/43/24/G/110	Cholderton	0.77	GW	Y	Cholderton & District Water Company			
	WATER COMPANY TOTAL	0.77						
	Page Sub-Total =	0.77	*Source Type: GW = Groundwater; SW = Surface Water.					Page 1 of 13

Table 11.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Wessex							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
13/43/28/S/052	Matchams	63.6	SW	N	Bournemouth & District Water Company			
13/43/35/G/109	Stanbridge	25.0	GW	N			Excludes river support	
13/43/37/G/118	Longham	31.8	GW SW	N			Potential to increase to 68 MI/d	
13/43/37/S/117								
13/43/37/S/029								
13/43/35/G/066	Wimborne	3.2	GW	Y				
	WATER COMPANY TOTAL	123.6						
Page Sub-Total =		123.6	*Source Type: GW = Groundwater; SW = Surface Water.					
Page 2 of 13								

Table 11.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Wessex							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
13/43/28/S/051	Knapp Mill	90.9	SW	N	West Hampshire Water Company		42 Ml/d of this yield is transferred to Fawley refinery	
13/43/26/G/052	Hale	10.0	GW	N				
IMPORT	Ampress	2.37	GW	N			Import from NRA Southern Region	
	WATER COMPANY TOTAL	103.27						
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Table 11.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Wessex							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
17/53/14/S/014	Line of Works	92.0	SW	Y	Bristol Waterworks Company		Sources used conjunctively		
16/52/12/S/043	Cheddar Yeo		GW						
16/52/14/S/013	Blagdon Lake								
16/52/15/S/013	Dundry & Elwell (Barrow)								
16/52/14/G/014	Blagdon Spring								
16/52/15/G/017	Cold Bath Barrow								
16/52/12/G/051	R Axe, Brinscombe								
17/53/06/G/007& 008	Shipton Moyne, Long Newton	14.5	GW	Y					
16/52/15/G/018	Chelvey	12.9	GW	Y					
16/52/13/G/011	Banwell	10.2	GW	Y					
18/54/23/S/013	Alderley	4.83	SW	Y					
17/53/11/G/094	Oldford	14.4	GW	Y					
17/53/11/G/013	Sherbourne Springs	4.79	SW	Y					
Page Sub-Total =		153.62	*Source Type: GW = Groundwater; SW = Surface Water.					Page 4 of 13	

Table 11.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Wessex							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
17/53/06/G/006	Tetbury	3.0	GW	Y	Bristol Waterworks Company (Cont'd)				
17/53/12/G/097	Gurney Slade	2.97	GW	Y					
16/52/12/G/047	Rodney Stoke	2.87	GW	Y					
16/52/12/G/044	Chaterhouse Spring	2.53	GW	Y					
16/52/12/G/046	Winscombe	2.33	GW	Y					
16/52/15/G/017	Clevedon	2.2	GW	Y					
16/52/10/G/047	Shepton Mallet	2.0	GW	Y					
16/52/12/G/050	Holes Ash, Wells	0.93	GW	Y					
16/52/10/G/043	Athletic Ground, Wells	0.78	GW	Y					
16/52/10/G/047	West Compton, Pilton	0.75	GW	Y					
17/53/12/S/016	Downhead (Standby)	0.5	SW	Y					
18/54/23/G/009	Kilcott	0.43	GW	Y					
16/52/12/G/052	Priddy Well	0.3	GW	Y					
17/53/12/G/015	Egford	4.94	GW	Y					
IMPORT	Gloucester/Sharpness Canal	190.0	SW	Y			Import from NRA Severn Trent Region. This figure includes 23 Ml/d raw water supply to ICI at Avonmouth, and 11.3 Ml/d that Bristol Water is committed to supply Wessex Water from the licence.		
	WATER COMPANY TOTAL	370.0							
Page Sub-Total =		216.53	*Source Type: GW = Groundwater; SW = Surface Water.					Page 5 of 13	

Table 11.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Wessex							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
17/53/01/G/410E	Rodbourne)	33.4	GW	Y	Wessex Water plc		Malmesbury Avon Scheme. Yield excludes river support abstractions		
17/53/01/G/400D	Park Road)								
17/53/01/G/410C	Charlton)								
17/53/01/G/410F	Cowbridge)								
13/43/34/G/149	Corfe Mullen	22.8	GW	Y					
13/44/43/G/004	Briantspuddle	18.18	GW	Y					
16/52/07/S/070	Durleigh	18.0	SW	Y					
13/43/34/S/229	Sturminster Marshall	16.0	SW	Y					
16/52/05/S/230	Clatworthy	15.8	SW	Y					
16/52/02/S/130	Sutton Bingham	15.2	SW	Y					
13/43/23/G/212	Chitterne & Codford	13.5	GW	Y					
13/44/58/G/105	Empool	12.5	GW	Y					
13/43/21/G/208	Wyndham Rd, Deans Farm	11.8	GW	Y					
13/43/26/G/104	Clarendon	11.0	GW	Y					
13/43/00/G/001	Mere	9.1	GW	Y					
13/43/34/G/216	Shapwick	9.09	GW	Y					
13/43/23/G/238C	Brixton Deverill	9.0	GW	Y					
13/43/23/G/238	Heytesbury	9.0	GW	Y					
13/44/59/G/106	Belhuish/East Lulworth	8.5	GW	Y					
13/43/28/S/129&128	Blashford	0.0	SW	Y			Under development. Possible yield of 50 Ml/d with full storage for peak topping		
Page Sub-Total =		232.87	*Source Type: GW = Groundwater; SW = Surface Water.					Page 6 of 13	

Table 11.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Wessex							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
13/44/60/G/004	Friar Waddon	8.2	GW	Y	Wessex Water plc (Cont'd)			
13/43/34/G/259	Black Lane	8.0	GW	Y				
17/53/01/G/405A	Holt 1&2	8.0	GW	Y				
16/52/07/G/069	Ashford, Bridgwater	7.1	SW	Y				
13/43/22/G/120	Fonthill Bishop	7.0	GW	Y				
13/44/55/G/105	Eagle Lodge, Bridport Rd	7.0	GW	Y				
13/43/24/G/019	Newton Toney	6.5	GW	Y				
17/53/01/G/207	Chippenham, Ivy Field	6.5	GW	Y				
13/44/42/G/101	Dewlish	6.0	GW	Y			Yield may be reduced by future River Piddle ALF scheme. Excludes stream support	
16/52/05/G/228	Fulwood Group	5.5	GW&SW	Y				
13/44/03/S/015	Sutton Poyntz	6.0	SW	Y				
13/44/44/G/100	Milbourne St Andrew	4.5	GW	Y				
17/53/01/G/203	Milbourne	5.7	GW	Y				
13/43/21/G/152	Durrington	4.9	GW	Y				
17/53/10/G/011A&B	Upton Scudamore	4.5	GW & SW	Y				
16/52/02/G/135	Lake	4.3	GW	Y				
16/52/01/G/063	Pole Rue	4.3	GW	Y				
Page Sub-Total =		104.0	*Source Type: GW = Groundwater; SW = Surface Water.				Page 7 of 13	

Table 11.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Wessex							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
13/44/41/G/005	Alton Pancras	3.7	GW	Y	Wessex Water plc (Cont'd)			
17/53/11/S/090	Corsley-Divers Bridge	3.5	SW	Y				
13/44/70/G/112	Litton Cheney	3.4	GW	Y				
13/44/55/G/021	Forston	3.4	GW	Y				
17/53/13/S/090 & 091	Tucking Mill & Midford	3.1	SW	Y				
13/44/56/G/103	Winterbourne Abbas	2.8	GW	Y				
13/43/21/G/137	Compton	2.7	GW	Y				
16/52/05/S/470	Hele Bridge	2.3	GW	Y				
13/43/24/G/101	Leckford Bridge	2.3	GW	Y				
16/51/03/S/013	Nutscale	2.3	SW	Y				
13/43/00/G/001	Stubhampton	2.2	GW	Y				
13/43/21/G/213	Chirton	2.2	GW	Y				
17/53/01/S/303	Monkswood	1.0	SW	Y				
16/52/03/G/079	Compton Durville	3.0	GW	Y				
13/43/21/G/154	Bourton	0.6	GW	Y				
16/52/02/G/128	Castleton	1.8	GW	Y				
13/43/22/G/081	Fovant	1.8	GW	Y				
Page Sub-Total =		42.1	*Source Type: GW = Groundwater; SW = Surface Water.					
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Table 11.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Wessex							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
17/53/11/S/011	Dunkerton	1.6	SW	Y	Wessex Water plc (Cont'd)				
13/44/52/S/001	Hooke	1.5	SW	Y					
16/52/02/G/133	Bradley Head	1.2	GW	Y					
13/43/23/G/101	Shrewton	1.2	GW	Y					
17/53/08/S/017	Calstone	1.1	SW	Y					
13/43/21/G/204	Bishops Cannings	1.1	GW	Y					
17/53/09/S/010	Luccombe	1.0	SW	Y					
17/53/01/S/304	Batheaston	0.95	SW	Y					
13/43/23/G/102	Wylfe	0.8	GW	Y					
17/53/04/S/025	Widdenham	0.8	SW	Y					
16/52/02/G/134	Woolcombe	1.0	GW	Y					
17/53/10/G/009	Wellhead	0.8	GW	Y					
13/43/22/G/075	Bulbridge	0.8	GW	Y					
13/44/51/G/001	Cattistock	0.7	GW	Y					
13/43/22/G/098	Boyne Hollow	0.7	GW	Y					
13/43/23/G/107	Arn Hill	0.7	GW	Y					
16/52/03/G/171	Waterloo Farm	0.7	GW	Y					
Page Sub-Total =		16.65	*Source Type: GW = Groundwater; SW = Surface Water.					Page 9 of 13	

Table 11.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Wessex							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
13/43/31/S/034	Penselwood	0.7	SW	Y	Wessex Water plc (Cont'd)			
16/52/02/G/131	Stockwood	0.6	GW	Y				
13/44/51/G/027	Maiden Newton	0.6	GW	Y				
17/53/08/G/047	Cherhill	0.6	GW	Y				
17/53/01/G/415	Lacock	0.5	GW	Y				
13/43/22/G/098	Barton Hill	0.5	GW	Y				
16/52/08/G/060	Castle Cary	0.3	GW	Y				
13/43/34/S/148	Okeford	0.5	SW	Y				
17/53/01/S/305	Oakford	0.5	SW	Y				
16/52/02/G/127	Milbourne Wick	0.2	GW	Y				
13/43/81/S/001	Langdon	0.4	SW	Y				
13/44/04/G/002	Portesham	0.4	GW	Y				
16/51/05/G/044	Broadwood Dunster	0.25	GW	Y				
17/53/09/G/099	Easterton	0.4	GW	Y				
16/52/04/G/062	Dommett	0.0	GW	Y				
17/53/01/G/201	Goodshill	0.3	GW	Y				
Page Sub-Total =		6.75	*Source Type: GW = Groundwater; SW = Surface Water.				Page 10 of 13	

Table 11.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Wessex							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
13/44/03/G/001	Ullwell	0.3	GW	Y	Wessex Water plc (Cont'd)			
16/52/05/G/060	Wayford	0.3	GW	Y				
13/44/03/G/105	West Lulworth	0.3	GW	Y				
16/52/09/G/076	Kingswood Warren	0.3	GW	Y				
16/52/02/G/011	Corscombe (Somerset)	0.2	GW	Y				
16/52/07/S/111	Dodington, Bridgwater	0.2	SW	Y				
16/52/03/G/080	Maiden Beech	0.2	GW	Y				
16/51/08/G/037	Traphole	0.2	GW	Y				
17/53/01/S/307	Weston	0.3	SW	Y				
17/53/22/G/290	Yatesbury	0.15	GW	Y				
16/52/05/S/227	Westleigh	0.1	SW	Y				
16/52/09/G/075	Pitcombe	0.1	GW	Y				
18/95/05/08/090	Wheddon Cross	0.01	SW	Y				
Intra-regional transfer	Stapley, Churchstanton	0.2	SW	Y				Intra-regional transfer from Bristol Waterworks Company
IMPORT	Tatworth	1.4	GW	Y				Import from NRA South West Region
	Page Sub-Total =	4.26	*Source Type: GW = Groundwater; SW = Surface Water.				Page 11 of 13	

Table 11.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Wessex							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
IMPORT	Bristol Water	11.3	SW	Y	Wessex Water plc (Cont'd)		Treated water import via Bristol Water Works Company NRA from Severn Trent Region	
IMPORT	Wimbleball Reservoir	31.8	SW	Y			Import from NRA South West Region	
IMPORT	Shepherd Shore	3.6	SW	Y			Import from NRA Thames Region	
IMPORT	Ludgershall	0.4	GW				Import from Southern Region	
	WATER COMPANY TOTAL	453.73						

Table 11.1

[illegible]

Table 11.2

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		INTER-REGIONAL TRANSFERS			NATIONAL RIVERS AUTHORITY	
NRA REGION: Wessex					DATE: APRIL 1994	
From (NRA region)	To (NRA region)	Source	Volume (Ml/d)	Comment		
Severn Trent	Wessex	Gloucester/Sharpness Canal	+ 190			
South West	Wessex	Wimbleball Reservoir	+ 32			
South West	Wessex	Tatworth	+ 1.4			
Thames	Wessex	Shepherd Shore	+ 3.6			
TOTAL			+ 227			
					Page 1 of 1	

Table 11.3

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		POTENTIAL FUTURE REGIONAL DEVELOPMENTS				NATIONAL RIVERS AUTHORITY	
NRA REGION: Wessex						DATE: APRIL 1994	
Line No	Development Name	Source* Type	Yield (Ml/d)	Yield Est. Agreed with Undertaker (Y/N)	Comment	Status and Class	
1	Cholderton	GW	<1	N	Location not identified	1	B
2	Wimbleball	SW	10	y	Addition transfer following pumped storage scheme	4	A
3	River Avon at Bath	SW	55	N	NRA to review WCo proposals	2	C

Table 11.4

Wessex Region					
Development Date	1993	2001	2011	2021 incl Class D schemes	2021 excl Class D schemes
Existing Source Yield (MI/d)	1051	1051	1051	1051	1051
Possible yield Cutbacks (MI/d)	0	-4	-4	-4	-4
Potential Future Schemes (MI/d)	0	+11	+66	+66	+66
TOTAL	+1051	+1058	+1113	+1113	+1113

Table 12.1

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Yorkshire							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
2.27.24.078	Acomb Landing	96.0	SW	Y	York Waterworks Company			
	WATER COMPANY TOTAL	96.0						
Page Sub-Total =		96.0	*Source Type: GW = Groundwater; SW = Surface Water.					Page 1 of 12

Table 12.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Yorkshire							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
2.27.20.13	Thorpe Arch (Dam Bridge and New Lane)	6.80	GW	Y	Yorkshire Water Services	Leeds		
2.27.18.19	Eggborough	4.58	GW	Y		Wakefield		
2.27.18.20	Heck	6.82	GW	Y				
2.27.18.21	Pollington	9.73	GW	Y				
2.27.18.22	Roall	5.23	GW	Y				
2.27.18.37	Cowick	13.64	GW	Y				
2.27.18.54	Carlton (Hanger Lane)	12.00	GW	Y				
2.27.18.38	Brayton	10.46	GW	Y				
2.27.24.79	Carlton (Mill Lane)	13.64	GW	Y				
2.27.20.88	Fewston Res Swinsty Res Washburn Thruscross Res Valley	101.0	SW	Y		Harrogate		
2.27.21.15	John O'Gaunt & Beaversdyke	6.84	SW	Y				
2.27.21.16	Scargill Reservoir							
2.27.21.17	Ten Acre Reservoir							
2.27.25.21	Boltby Reservoir	0.91	SW	Y				
2.27.21.18	Eagle Level Adit	5.45	GW	Y				
2.27.21.21	Lothouse Spring	0.02	SW	Y				
Page Sub-Total =		197.12	*Source Type: GW = Groundwater; SW = Surface Water.					Page 2 of 12

Table 12.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Yorkshire							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
2.27.22.27	Roundhill/Lumley Moor Res	2.28	SW	Y	Yorkshire Water Services (Cont'd)	Harrogate (Cont'd)			
2.22.22.29	Charlesmoor Tunnel	0.70	SW	Y					
2.27.22.30	Mickley BH	0.55	GW	Y					
2.27.22.37	Burton Leonard BH	0.26	GW	Y					
2.27.22.38	Lower Dunsforth BH	4.55	GW	Y					
2.27.22.209	Birk Gill, R Burn and Spruce Gill	27.00	SW	Y					
2.27.22.210	Leighton Reservoir								
2.27.23.355	Studforth BH	0.60	GW	Y					
2.27.22.34	Ripon Camp BH	0.91	GW	Y					
2.27.24.158	Moor Monkton-Eccup-Huby	68.00	SW	Y					
2.27.23.26	Kepwick	1.81	SW	Y					
2.27.23.33	Codbeck & Oakdale Reservoir	4.13	SW	Y					
2.27.23.332	Ainderby Steeple	4.82	GW	Y					
2.27.22.20	Addleborough	0.40	SW	Y					
2.27.22.20	Askrigg	0.07	SW	Y					
2.27.22.20	Carperby	0.54	SW	Y					
2.27.22.20	Newbeggan	0.01	SW	Y					
Page Sub-Total =		116.63	*Source Type: GW = Groundwater; SW = Surface Water.					Page 3 of 12	

Table 12.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Yorkshire							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
2.27.22.20	West Burton	0.09	SW	Y	Yorkshire Water Services (Cont'd)	Harrogate (Cont'd)			
2.27.22.21	Countersett	0.12	SW	Y					
2.27.22.21	Gayle		SW	Y					
2.27.22.21	Marsett	0.01	SW	Y					
2.27.22.21	Stalling Busk	0.02	SW	Y					
2.27.22.24	Caldbergh	0.07	SW	Y					
2.27.22.328	Fossdale	0.48	SW	Y					
2.27.23.34	Garland Hill	0.36	SW	Y					
2.27.23.46	Downholme	0.01	SW	Y					
2.27.22.24	Sowden Beck	0.14	SW	Y					
2.27.22.25	Middleham	0.05	SW	Y					
2.27.22.26	Agra	0.145	SW	Y					
2.27.22.26	Ilton	0.30	SW	Y					
2.27.22.26	Ellingstring	0.05	SW	Y					
2.27.22.214	R Ure, Kilgrambridge	10.00	SW	Y					
2.27.23.23	Pickhill	0.88	SW	Y					
Page Sub-Total =		12.73	*Source Type: GW = Groundwater; SW = Surface Water.					Page 4 of 12	

Table 12.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Yorkshire							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (MI/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
2.27.23.32	Bellerby BH	0.00	GW	Y	Yorkshire Water Services (Cont'd)	Harrogate (Cont'd)			
2.27.23.46	Cranehow bottom	0.191	SW	Y					
2.27.23.30	Crumma	0.40	GW	Y					
2.27.23.30	Newsham	1.49	GW	Y					
2.27.23.30	Gandale	0.73	GW	Y					
2.27.23.31	Coalsgarth	0.40	GW	Y					
2.27.23.31	Feldom (Low Zone)	0.95	GW	Y					
2.27.23.340	Catterick Bridge	4.55	GW	Y					
2.26.31.47	R Hull Tophill Low	68.00	SW	Y		Hull			
2.26.32.126	Cottingham BH	66.00	GW	Y					
2.26.32.126	Dunswell BH								
2.26.32.126	Keldgate BH								
2.26.32.126	Springhead BH								
2.26.32.126	Swanland BH								
2.26.31.2	Kilham BH	4.55	GW	Y					
2.26.31.6	Hutton BH	2.18	GW	Y					
Page Sub-Total =		149.4	*Source Type: GW = Groundwater; SW = Surface Water.					Page 5 of 12	

Table 12.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Yorkshire							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
2.26.31.87	Elmswell BH	6.82	GW	Y	Yorkshire Water Services (Cont'd)	Hull (Cont'd)		
2.26.32.124	Etton BH	13.80	GW	Y				
2.26.34.4	Springwells	1.80	GW	Y				
2.26.34.6	Newbald BH	1.60	GW	Y				
2.27.28.4	Millington Spring	1.15	SW	Y				
2.26.30.2	Mill Lane BH	6.80	GW	Y				
2.26.30.3	Halsthorpe BH	15.00	GW	Y				
2.26.30.4	Burton Agnes BH	2.73	GW	Y				
2.27.23.27	Kilburn (Olstead)	0.82	SW	Y		Malton		
2.27.25.12	East Moors	0.03	SW	Y				
2.27.25.15	East Ness BH	11.25	GW	Y				
2.27.25.100	Rudland	0.36	SW	Y				
2.27.25.128	Keld Head BH	7.00	GW	Y				
2.27.27.2	Norton (Howe Hill) BH	3.36	GW	Y				
2.27.27.58	Irton BH	27.27	GW	Y				
2.27.27.136	Cayton (Station Road)	10.91	GW	Y			In contact with R Derwent West Ayton	
2.27.27.136	Cayton Carr							
2.27.29.10	Hazelhead	1.87	SW	Y				
	Page Sub-Total =	112.57	*Source Type: GW = Groundwater; SW = Surface Water.					Page 6 of 12

Table 12.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Yorkshire							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
2.27.29.12	R Esk Russwarp	8.27	SW	Y	Yorkshire Water Services (Cont'd)	Malton (Cont'd)		
2.27.29.14	Westerdale	1.14	GW	Y				
IMPORT	Doncaster Well Field	83.0	SW	Y		Sheffield	Import from NRA Severn Trent Region	
2.27.5.29	Redmires Reservoir	14.0	SW	Y				
2.27.5.29	Rivilin	6.2	SW	Y				
IMPORT	Ladybower Reservoir	40.0	SW	Y			Import from NRA Severn Trent Region	
2.27.5.30	Daledyke & Ogden Reservoirs	26.0	SW	Y				
2.27.5.31	Broomhead Reservoir	27.0	SW	Y				
2.27.5.12	Ingbirchworth Reservoir	9.0	SW	Y				
2.27.5.13	Royd Moor Reservoir							
2.27.5.32	Langsett Reservoir	39.0	SW	Y				
2.27.5.11	Midhope Reservoir							
2.27.5.26	Winscar Group	22.0	SW	Y				
2.27.12.35 2.27.12.254	Baiting, Ryburn and Blackhouse Reservoirs	43.4	SW	Y		Calder		
2.27.12.37	Greenwithen & Ringstone Reservoirs							
2.27.12.36	Withens Clough Reservoir							
2.27.12.41	10 Reservoirs in the Upper Hebden, Luddenden & Hebble Valleys	46.0	SW	Y				
Page Sub-Total =		365.01	*Source Type: GW = Groundwater; SW = Surface Water.				Page 7 of 12	

Table 12.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Yorkshire							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
2.27.12.43	Gorpley Reservoir	2.5	SW	Y	Yorkshire Water Services (Cont'd)	Calder (Cont'd)		
2.27.10.63	Bradshaw and Holme, Digley	21.0	SW	Y				
2.27.10.11	Yateholme, Riding Wood, Ramsden and Brownhill Reservoir	57.0	SW	Y				
2.27.12.261	Deanhead and Scammonden Reservoir							
2.27.11.65	Wessenden Head, Butterley, Deerhill, Blackmoorfoot and High Moor Reservoir							
2.27.11.66	Longwood, Upper and Lower							
2.27.12.39	Ramsden Reservoir							
2.27.16.21	Weechee and Baildon Moor Reservoir and Morton Springs	1.14	SW	Y		Bradford		
2.27.16.22	Graincliffe Reservoir and Springs and Morton Springs	0.67	SW&GW	Y				
2.27.16.26	Moortop and Netherfield Road							
2.27.16.160	Thornton Moor and Stubden Reservoir	9.0	SW	Y				
2.27.19.6	Panorama, Hill top and Old Reservoir	0.37	SW	Y				
2.27.19.8	March Ghyll Reservoir	2.74	SW	Y				
2.27.19.9	Reva Reservoir							
Page Sub-Total =		94.42	*Source Type: GW = Groundwater; SW = Surface Water.					Page 8 of 12

Table 12.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY		
NRA REGION: Yorkshire							DATE: APRIL 1994		
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment		
2.27.19.138	Combined Licence for Panorama Carr Bottom, Weecher, Graincliffe and Reva Reservoirs	3.0	SW	Y	Yorkshire Water Services (Cont'd)	Bradford (Cont'd)			
2.27.14.9	Lower Laithe Reservoir	6.5	SW	Y		Skipton			
2.27.14.10	Keighley Moor Reservoir	12.00	SW	Y					
2.27.14.58	Ponden Reservoir								
2.27.15.41	Watersheddles Reservoir								
2.27.15.27	Whitemoor BH	0.45	GW	Y					
2.27.15.45	Embsay Reservoir and Mill Beck	2.70	SW	Y					
2.27.15.42	Whinny Gill and Henny Gill Reservoir	1.0	SW	Y					
2.27.15.48	Elslack Reservoir								
2.27.15.252	Clogger Lane	0.07	GW	Y					
2.27.15.49	Airton/Malham BHs								
2.27.15.266	Airton/Malham BHs	0.17	GW	Y					
2.27.15.225	Cowling BH								
2.27.15.235	Hodge Clough								
26.71.301.21	Langcliffe/Stainforth	0.05	SW	Y					
26.71.301.22	Helwith Bridge	0.04	SW	Y					
26.71.301.23	Horton In Ribblesdale	0.07	SW	Y					
26.71.302.19	Settle Springs	0.51	SW	Y					
Page Sub-Total =		26.56	*Source Type: GW = Groundwater; SW = Surface Water.					Page 9 of 12	

Table 12.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Yorkshire							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
26.71.302.31	Giggleswick BH	0.55	GW	Y	Yorkshire Water Services (Cont'd)	Skipton (Cont'd)		
26.71.516.9	Ingleton	0.75	SW	Y				
26.72.519.13	Alnwick/Wharfe/Lawkland	0.08	SW	Y				
26.72.519.13	Southern Scales & Swarbeck							
26.72.520.6	Keasden	0.17	SW	Y				
26.72.520.7	Bentham/Burton in Lonsdale	0.53	SW	Y				
26.72.520.13	Burn Moor	1.14	SW	Y				
26.72.520.15	Bentham	0.09	SW	Y				
2.27.19.21	Conlston/Kilnsey	0.05	SW	Y				
2.27.19.22 2.27.19.24 2.27.19.27 2.27.19.30 2.27.19.57	Grassington/Hebden/Linton	1.05	SW	Y				
2.27.19.23	Star Botton	0.01	SW	Y				
2.274.19.25	Buckden	0.03	SW	Y				
2.27.19.28	Oughtershaw	0.01	SW	Y				
2.27.19.53	Burnsall Springs	0.14	SW	Y				
2.27.19.54	Upper and Lower Barden							
	Page Sub-Total =	4.6	*Source Type: GW = Groundwater; SW = Surface Water.					Page 10 of 12

Table 12.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Yorkshire							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
2.27.19.56	Kettlewell	0.03	SW	Y	Yorkshire Water Services (Cont'd)	Skipton (Cont'd)		
2.27.21.92	Scar House and Angram Reservoirs	110.0	SW	Y				
2.27.19.121	Hawkswick	0.04	SW	Y				
2.27.19.5	R Wharfe The Hollins	18.0	SW	Y				
2.27.19.128	R Wharfe, Lobwood	92.0	SW	Y				
2.27.19.129	R Wharfe, Lobwood							
2.27.28.17	Elvington R Derwent	269.0	SW	Y		Grid		
2.27.28.83	Barmby R Derwent							
	WATER COMPANY TOTAL	1568.11						

Table 12.1 continued

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		EXISTING SOURCE YIELD ESTIMATES					NATIONAL RIVERS AUTHORITY	
NRA REGION: Yorkshire							DATE: APRIL 1994	
Licence Number	Source Name/Location	Yield (Ml/d)	Source Type*	Yield Est. Agreed with Undertaker	Water Company Name	Supply Area	Comment	
	WATER COMPANY TOTAL	96.0			York Waterworks Company			
	WATER COMPANY TOTAL	1568.11			Yorkshire Water Services			

Table 12.2

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		INTER-REGIONAL TRANSFERS			NATIONAL RIVERS AUTHORITY	
NRA REGION: Yorkshire					DATE: APRIL 1994	
From (NRA region)	To (NRA region)	Source	Volume (Ml/d)	Comment		
Yorkshire	Northumbria	Scaling Reservoir	-5			
Yorkshire	North West	Fernilee, Neston and Ramsden boreholes	-8.6			
Sub-total			-13.6			
Severn Trent	Yorkshire	Derwent Valley Reservoirs (Ladybower)	+ 40			
Severn-Trent	Yorkshire	Doncaster Boreholes	+ 83	Planned to be cut-back to + 65 by 1994		
Sub-Total			+ 123	Planned to be cut-back to + 105 by 1994		
TOTAL			+ 109.4	Planned to be cut-back to + 91.4 by 1994		
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Table 12.3

NATIONAL WATER RESOURCES DEVELOPMENT STRATEGY		POTENTIAL FUTURE REGIONAL DEVELOPMENTS				NATIONAL RIVERS AUTHORITY	
NRA REGION: Yorkshire						DATE: APRIL 1994	
Line No	Development Name	Source* Type	Yield (Ml/d)	Yield Est. Agreed with Undertaker (Y/N)	Comment	Status and Class	
1	Groundwater developments - York	GW	35	Y	Original scheme proposals are not yet believed promotable	3	C
2	R Ouse licence changes	SW	30	Y	Reallocation of YWW licence	2	A
3	Local groundwater developments	GW	20	N	Being investigated by Yorkshire Water	1	A
4	Operational changes	SW	50	N	Being investigated by Yorkshire Water	3	A
5	Washburn Valley	SW	50	N		2	D
6	River Aire resources	SW	50	N		1	D
7	Transfers from Kielder	SW	60	N		1	D
TOTAL			up to 295	* Source Type: GW = Groundwater, SW = Surfacewater			Page 1 of 1

Table 12.4

Yorkshire Region					
Development Date	1993	2001	2011	2021 incl Class D schemes	2021 excl Class D schemes
Existing Source Yield (MI/d)	1664	1664	1664	1664	1664
Possible yield Cutbacks (MI/d)	0	-18	-18	-18	-18
Potential Future Schemes (MI/d)	0	+ 100	+135	+ 295	+ 135
TOTAL	1664	1746	1781	1941	1781