REVIEW OF WATER COMPANY YIELDS

APPENDIX 2 - RESULTS FOR EACH WATER COMPANY

MARCH 1998

Introduction

This appendix contains the detailed deployable output results for each water company. The appendix is arranged by Environment Agency Region. Each Regional grouping contains an Agency aquifer sustainability map, followed by detailed results for each company, consisting of an Agency commentary, a resource zone map and the breakdown of the results.

Groundwater unit assessment

The Agency has reviewed each of the aquifer units in England and Wales to establish whether:

- long term reductions in groundwater levels are occurring, and whether
- adequate water resources have been reserved for river and other environmental needs.

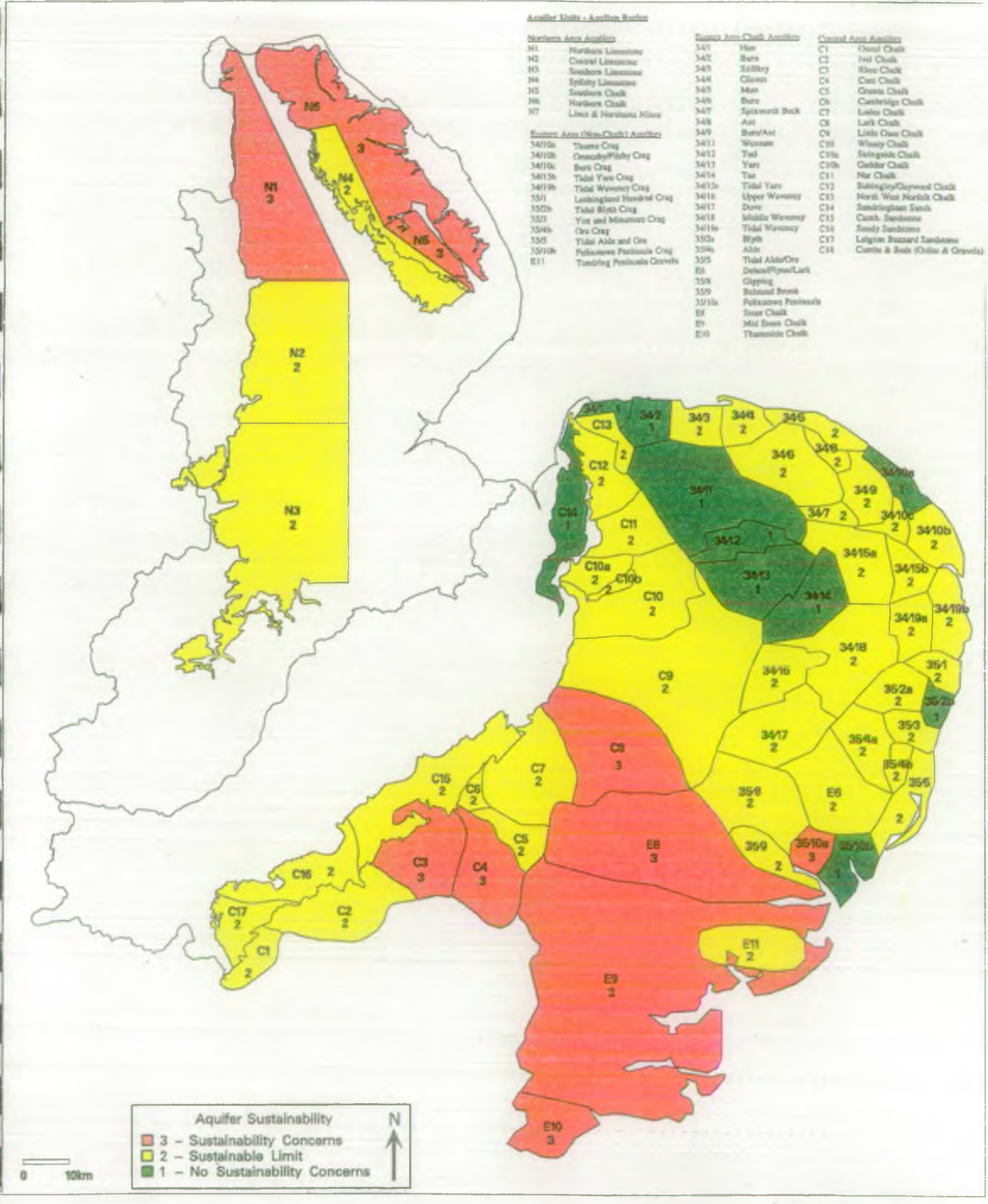
A simple "water accountancy" procedure has been used considering factors such as the natural recharge to the aquifer, the quantity taken by existing licensed abstractions and the environmental requirement for water, primarily for river flows. The procedure allows each aquifer unit to be placed into one of the three categories defined as follows:

Category 1	no overall sustainability concerns
Category 2	at sustainable limit
Category 3	sustainability concerns

This is a generalised approach; the nature of the method means that it is not definitive and more work would be needed to ascertain the environmental needs of any aquifer unit that has been placed in Category 3. Similarly, the overall balance of an aquifer unit may place it in Category 1, but there may be site specific problems associated with particular abstractions.

WATER COMPANIES OF ENGLAND AND WALES

ANGLIAN REGION



AQUIFER SUSTAINABILITY - Anglian Region

Anglian Water Services

Anglian Water Services are the main water service company for the Anglian Region, covering an area from the Humber to the Thames and supplying a population of about 4 million.

The company has identified three resource zones: Northern, Western and Eastern.

The company's supplies are almost evenly split between groundwater and surface water sources overall, but with a greater reliance on surface water systems in the western part of the region and a predominance of groundwater sources in the east with some direct river intakes and smaller reservoirs. In general the surface water systems and associated groundwater sources in the Northern and Western zones are more integrated, whilst groundwater sources in the Eastern zone tend to supply local demand centres with fewer strategic links.

The largest and most integrated surface water system, Ruthamford (based on the three main pumped storage reservoirs of Rutland, Grafham and Pitsford) forms the basis of the Western zone.

Overall there is very little change in the company's average total yields from previous figures, with a decrease of under 1% compared to the previous total.

Groundwater deployable outputs remain virtually unchanged from previous figures, although there are some changes on individual sources. This is not surprising, and reflects the fact that previous figures were assessed by similarly rigorous methods, as well as the extent to which the company have undertaken works to secure or maintain groundwater output capability at licensed abstraction.

Surface water deployable outputs show a slight overall decrease of 3.5% from previous figures, although some individual sources increase and others decrease within this average. The main differences are due to changes in the definition of deployable output and methodology for assessment of direct river intakes. Some minor changes also arise from inclusion of emergency storage and the effects of other abstraction patterns upstream of water company intakes.

Previous estimates of yield for the main reservoir systems were based on methodologies similar to the second scenario. The second and third scenarios show some increase in deployable output compared to scenario 1 as a result of demand management during severe droughts. In some cases there is no difference between the scenarios as the key constraint is infrastructure rather than water availability.

The outage allowances appear reasonable and take account of adequate flexibility and security in the company's supply system.

Key points to note for each zone are:

Northern

The yield of Cadney which is supported by the Agency's Trent Witham Ancholme transfer scheme has decreased compared to previous figures. This is mainly as a result of reassessment of the critical low flows and associated dry weather losses for the transfer scheme. The deployable outputs for potable and non-potable supply from Elsham sourceworks (which relies primarily on water from Cadney) are presented separately as Northern non-potable and Ancholme.

The Agency is concerned about overall sustainability of groundwater abstraction in the Chalk and Limestone aquifers in this zone; Chalk abstraction is currently limited under an agreement with the company.

Western

The yield of Rutland reservoir has decreased as a result of the introduction of Wing treatment works as the limiting constraint on the deployable output. In practice this constraint existed previously and earlier yield figures included an allowance for future potential extension of the works.

The deployable of Grafham reservoir has increased by 3% on the previous assessment and shows a further 5% increase under scenarios 2 and 3 and Pitsford reservoir shows similar small increases.

However deployable outputs of other smaller sources in the zone have decreased, and Foxcote reservoir is currently out of commission.

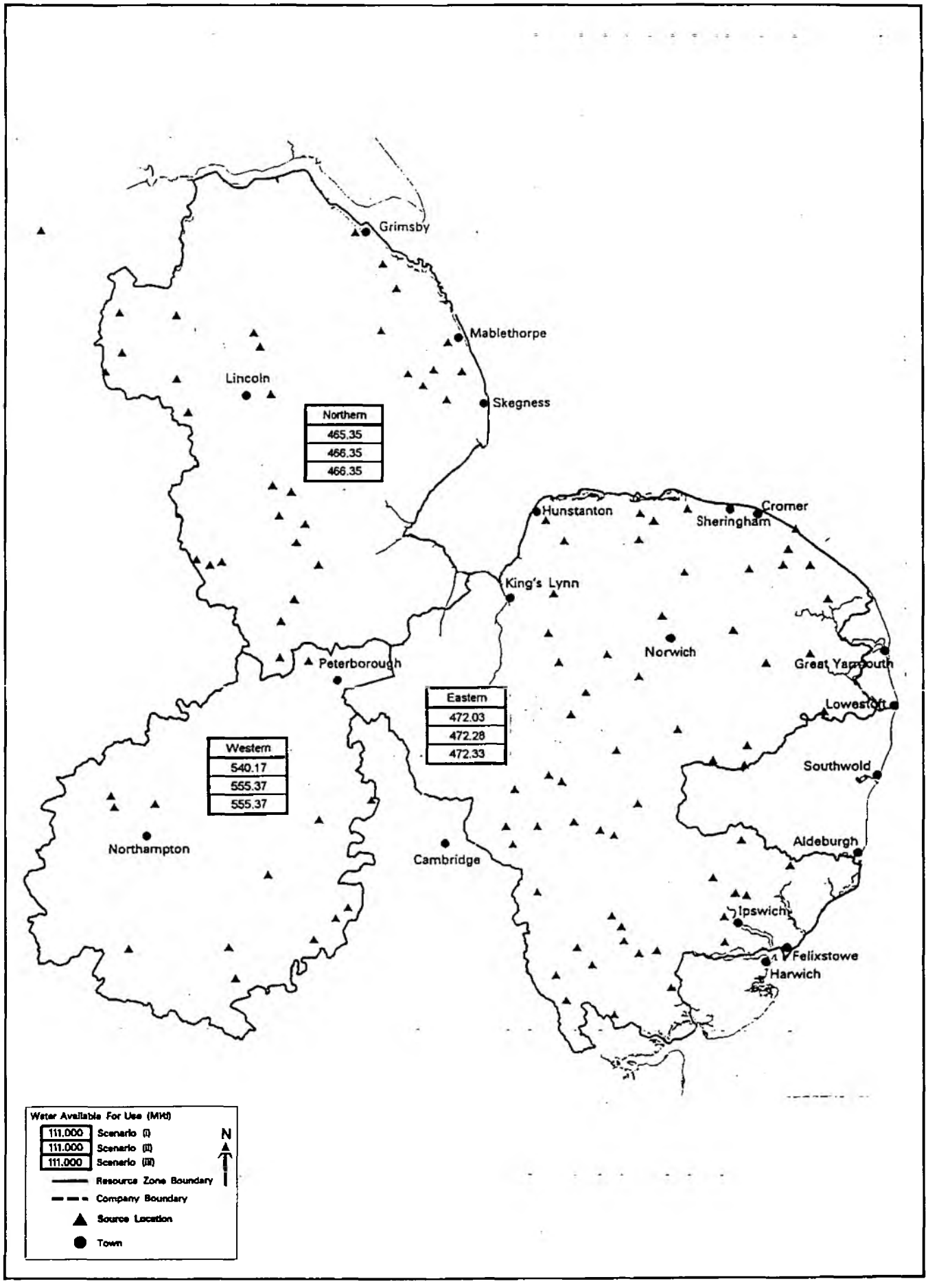
Eastern

Groundwater provides nearly 80% of the deployable output in this zone, with direct surface water intakes forming the other main source.

The deployable outputs of direct river intakes remain unchanged compared to previous yield figures, although the accounting of surface and groundwater conjunctive use leads to some apparent differences in figures.

The yield of Alton reservoir in this zone has decreased significantly compared to previous yield figures mainly as a result of more rigorous analysis than applied previously, particularly the use of an extended flow record including the critical 1930's drought period.

Map 1



Anglian Region
ANGLIAN WATER SERVICES SUPPLY AREA

ANGLIAN WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
EASTERN ZONE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Alton	23.50	23.50	23.50							
Ardleigh	11.05	11.30	11.35							
Run of River Schemes										
Costessy/Heigham				46.58						
Marham				20.95						
Stoke Ferry				18.00						
Groundwater Sources										
Alton					41.78	64.27				
Bury					74.30	109.40				
Stanway					53.20	83.80				
Heigham (Excluding Costessey Pits)					14.38	16.97				
Dereham					32.12	43.55				
Rushall					38.19	43.67				
Sheringham					37.38	51.16				
Isleham					43.98	64.38				
Stoke Ferry (Excluding Marham and Wellington)					48.62	59.61				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	34.55	34.80	34.85	85.53	381.95	536.81	30.00	472.03	472.28	472.33

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	502.03		
	Scenario 2	502.28		
	Scenario 3	502.33		
	Change from Scenario 3 to Scenario 1		0.30 Ml/d	0.06 %
	Change from Scenario 3 to Scenario 2		0.05 Ml/d	0.01 %

NOTES

1. Ardleigh source shared between Tendring Hundred Water Services and Anglian Water Services.

ANGLIAN WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
WESTERN ZONE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Ravensthorpe & Hollowell	7.40	7.60	7.60							
Rutland	220.00	220.00	220.00							
Grafham	255.00	269.00	269.00							
Pitsford	41.50	42.50	42.50							
Foxcote	0.00	0.00	0.00							
Run of River Schemes										
Clapham				16.00						
Groundwater Sources										
Clapham					30.27	36.71				
Imports and Exports										
17 Ml/d Export to Severn Trent Water										
91 Ml/d Export to Three Valleys Water										
RESOURCE ZONE TOTAL	523.90	539.10	539.10	16.00	30.27	36.71	30.00	540.17	555.37	555.37

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	570.17		
	Scenario 2	585.37		
	Scenario 3	585.37		
	Change from Scenario 3 to Scenario 1		15.20 Ml/d	2.67 %
	Change from Scenario 3 to Scenario 2		0.00 Ml/d	0.00 %

ANGLIAN WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
NORTHERN ZONE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Covenham	59.00	60.00	60.00							
Run of River Schemes										
Northern - non potable				50.40						
Ancholme				30.00						
Saltersford				22.36						
Groundwater Sources										
Elsham					30.60	43.55				
Covenham					67.00	95.83				
Gainsborough					15.80	17.88				
Lincoln					65.68	87.32				
Raithby					41.39	58.72				
Saltersford					13.04	21.80				
Bourne					80.08	114.40				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	59.00	60.00	60.00	102.76	313.59	439.50	10.00	465.35	466.35	466.35

TOTAL DEPLOYABLE OUTPUT (Ml/d)		
	Scenario 1	475.35
	Scenario 2	476.35
	Scenario 3	476.35
	Change from Scenario 3 to Scenario 1	1.00 Ml/d 0.21 %
	Change from Scenario 3 to Scenario 2	0.00 Ml/d 0.00 %

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES, 1994	1576.24 Ml/d	
SCENARIO 2 DEPLOYABLE OUTPUT	1564.00 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-12.24 Ml/d	-1 %
1997 WATER AVAILABLE FOR USE	1494.00 Ml/d	

Cambridge Water Company

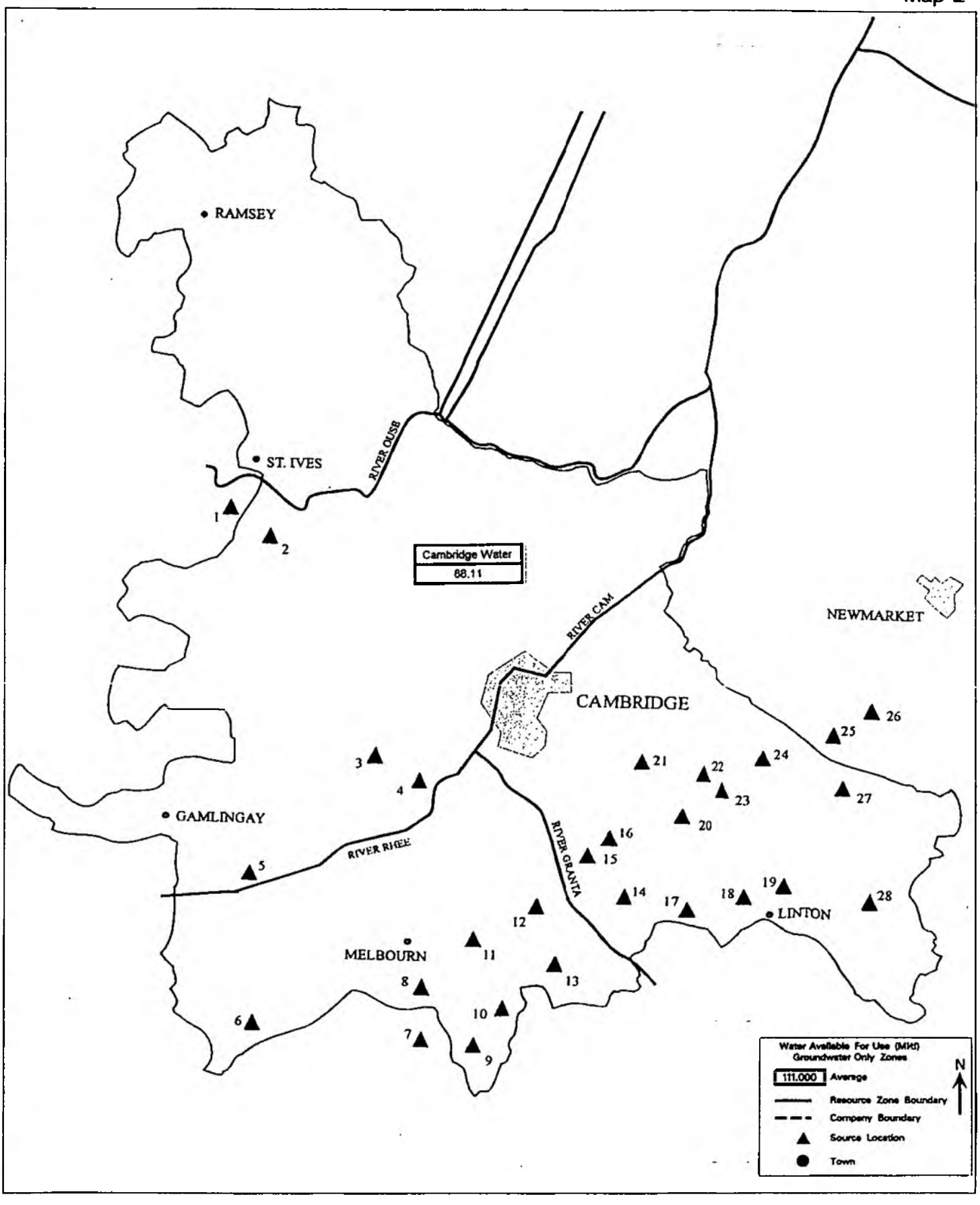
Cambridge Water supplies the city of Cambridge and surrounding parts of the county of Cambridgeshire. It is entirely dependant on groundwater sources, mainly abstracting from the chalk aquifer.

The company has a reasonably integrated system which relies on an overall movement of water predominantly from sourceworks in the south and east towards the north and west of its supply area, and particularly into the city itself. The results are presented as a single resource zone which is acceptable although there may be some weaker links within the network.

The total deployable output is 7% lower than the previous yield estimate, but it must be stressed that this is not a true like-for-like comparison. The decrease reflects changes in the definitions rather than real decreases in the yield of individual sources. The differences are mainly accounted for by the exclusion of undeveloped sources. The previous yield figure included an element of potential yield from future sourceworks development which has not yet taken place, and which is dependant on a time limited licence quantity of 12 Ml/d that expires in 2003. When this aspect is excluded, the total deployable output of the remaining sources has actually increased slightly compared to previous figures.

The outage allowance is based on total loss of the single largest source (Fleam Dyke) to potential pollution risk and at 15% appears excessive, although it is consistent with the broad definition of outage given by the Agency for this work. The Agency believe the outage should be investigated further and on the basis of level of risk, alternatives should be assessed and costed to reduce the potential loss (eg installation of additional treatment capacity or satellite sources).

Map 2



Anglian Region

CAMBRIDGE WATER SUPPLY

CAMBRIDGE WATER COMPANY

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
COMPANY-WIDE	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Reservoirs				
None				
Run of River Schemes				
None				
Groundwater Sources				
Abington Park				
Babraham				
Brettenham				
Croydon				
Dullingham				
Duxford Airfield				
Duxford Grange				
Euston				
Fleam Dyke				
Fowlmere				
Fulbourne/Weston Colville				
Great Chishill				
Great Wilbraham				
Heydon				
Hinxton Grange				
Horseheath				
Kingston				
Linton				
Lowerfield				
Melbourne				
Morden Grange				
Rivey				
St Ives				
Westley				
Imports and Exports				
None				

RESOURCE ZONE TOTAL

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	103.68
	Peak Week	121.50
WATER AVAILABLE FOR USE (Ml/d)	Average	88.11
	Peak Week	105.93

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
Average	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
1.00	4.44			
9.09	9.09			
0.00	0.00			
1.99	2.18			
3.60	4.10			
4.56	4.98			
3.41	3.95			
8.00	10.00			
15.57	15.97			
9.09	11.36			
4.59	4.98			
1.15	1.33			
4.58	4.58			
1.13	2.27			
5.77	6.82			
2.30	2.88			
0.00	0.00			
1.93	2.73			
3.41	4.27			
7.94	9.55			
2.27	2.71			
2.20	2.75			
1.20	1.20			
8.90	9.36			
103.68	121.50	15.57	88.11	105.93

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	111.90 Ml/d
AVERAGE DEPLOYABLE OUTPUT	103.68 Ml/d
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-8.22 Ml/d
1997 WATER AVAILABLE FOR USE	88.11 Ml/d

2 March 1998

.7 %

Essex & Suffolk Water

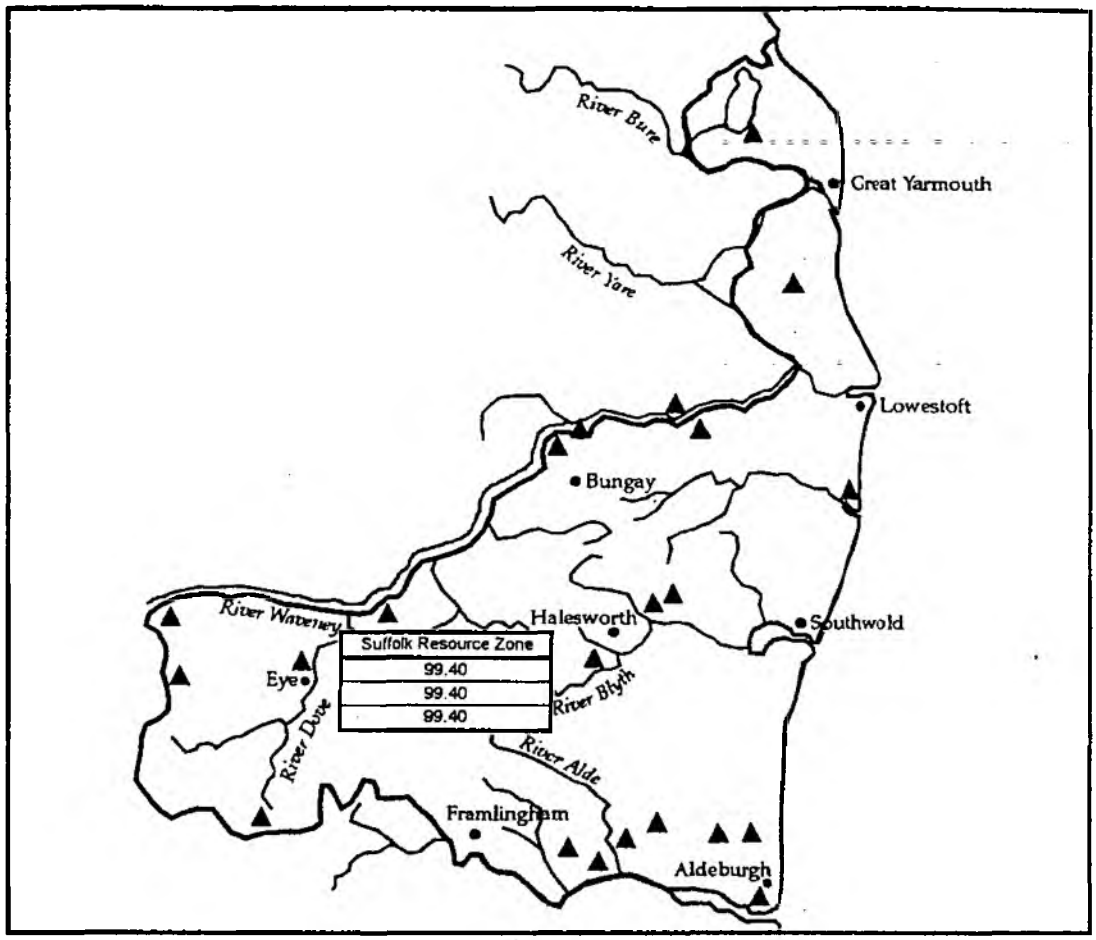
Essex & Suffolk Water supplies parts of the counties of Essex and Suffolk. Supplies to their two resource zones are entirely separate.

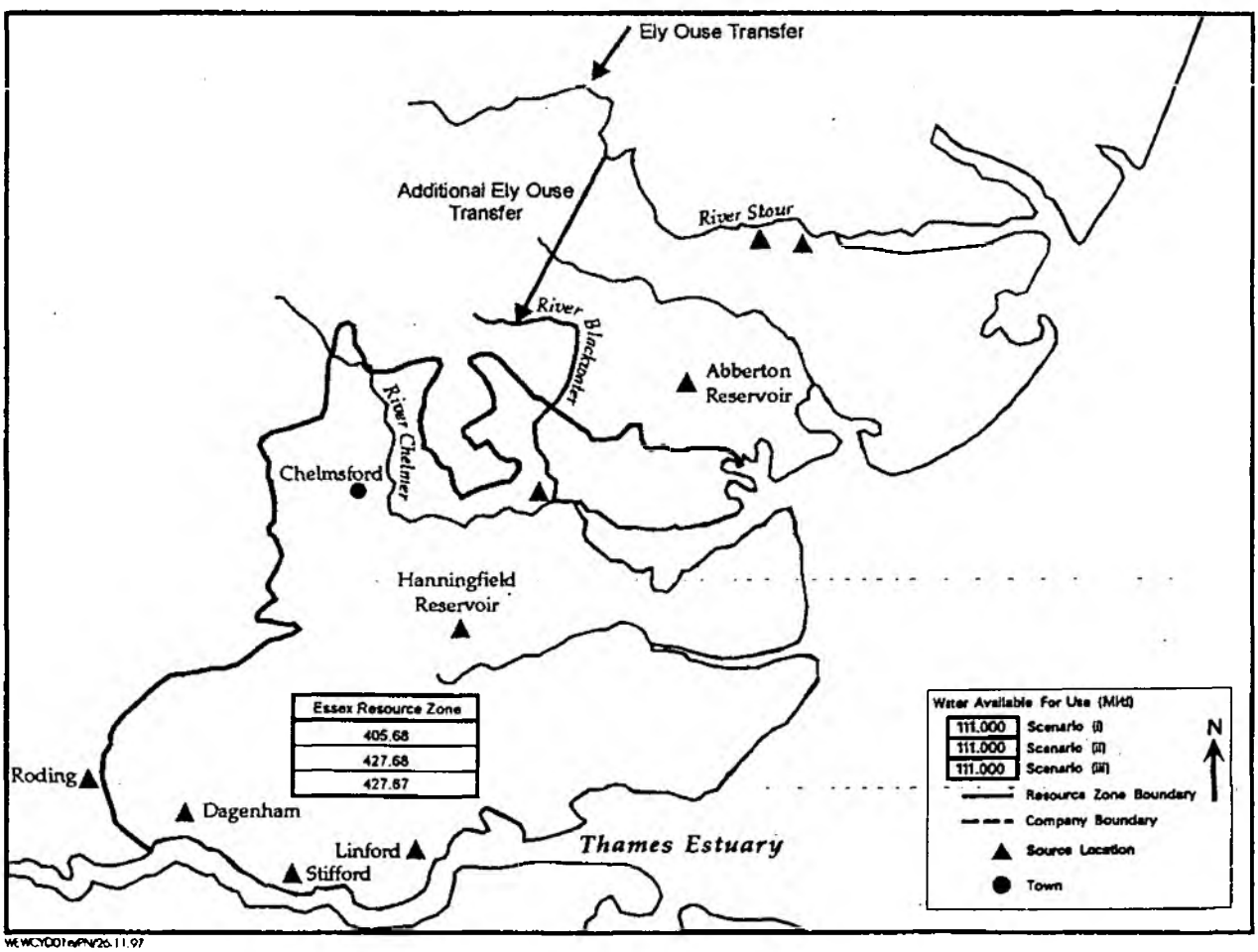
In Essex, the company has a highly integrated system. This consists of the two pump storage reservoirs at Abberton and Hanningfield, some small direct river intakes, and groundwater abstractions in the south of the area. Abberton and Hanningfield are supported by interbasin transfers from the Ely Ouse, and together provide around 75% of the yield of the zone. A bulk water supply from Thames Water provides a further 22% of the zone's water; the balance comes from groundwater sources. The area is highly urbanised, major towns including Chelmsford, Southend-on-Sea and the London boroughs of Dagenham and Barking.

Scenario 1 most closely resembles previous estimates of yield. The new value of deployable output for Scenario 1 is slightly lower than the previous value. This is explained by changes to the way that other abstractors in the catchment operate, and improved information on hydrological losses.

For Essex, Scenarios 2 and 3 are identical. In both cases, the deployable output is about 7% higher than Scenario 1, demonstrating the benefit of restricting demand in the worst droughts on record. However, the water company defined scenario 2 may change following the results of their customer survey currently in progress.

In contrast, Suffolk is a predominantly rural resource zone. Just over half of the yield of the zone is derived from direct surface water intakes, with the rest coming from groundwater abstractions. Sources tend to be close to demand centres, with little integration of the system across the county. The newly calculated deployable output for this zone is around 5% higher than the previous yield value; this is mainly due to the different assumptions made in applying the UKWIR groundwater methodology.





WE WCYDD1\ePN\26.11.97

Anglian Water

ESSEX AND SUFFOLK WATER SUPPLY AREA

ESSEX AND SUFFOLK WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SCURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
ESSEX	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Abberton Reservoir										
Hanningfield Reservoir										
Run of River Schemes										
River Blackwater & Chelmer	315.00	337.00	337.00							
River Stour										
Roman River										
Groundwater Sources										
Roding										
Seven Kings					3.14	5.23				
Dagenham										
Stifford					4.04	4.40				
Linford					4.50	5.95				
Imports and Exports										
Abstraction at Denver, Norfolk (Ely-Ouse Transfer Act, 1968)										
Bulk Supply from Thames Water (Chigwell Bulk Supply Agreement, May 1963.)				91.00						
RESOURCE ZONE TOTAL	315.00	337.00	337.00	91.00	11.68	15.58	12.00	405.68	427.68	427.68

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	417.68		
	Scenario 2	439.68		
	Scenario 3	439.68		
	Change from Scenario 3 to Scenario 1		22.00 Ml/d	5 %
	Change from Scenario 3 to Scenario 2		0.00 Ml/d	0 %

NOTES

1. Many individual source deployable outputs were not available as a result of the conjunctive use scheme.

ESSEX AND SUFFOLK WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
SUFFOLK	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
None										
Run of River Schemes										
Belaugh, River Bure										
Horning, River Bure (Abandoned)										
Ormesby Broad										
Lound										
Shipmeadow, River Waveney										
Groundwater Sources										
Grange Farm										
Juby Farm										
Waveney Chalk										
Central Groundwater Group					24.00	25.80				
Blyth Group					14.70	20.00				
Hartismere					7.30	11.20				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	102.00	102.00	102.00		46.00	57.00	2.60	99.40	99.40	99.40

TOTAL DEPLOYABLE OUTPUT (Ml/d)

Scenario 1	102.00
Scenario 2	102.00
Scenario 3	102.00

Change from Scenario 3 to Scenario 1	0.00 Ml/d	0 %
Change from Scenario 3 to Scenario 2	0.00 Ml/d	0 %

NOTES

1. The deployable output of the sources at Belaugh, Ormesby Broad, Lound, Shipmeadow, Grange Farm, Juby Farm and Waveney Chalk aggregates to 56 Ml/d. This figure is included in the resource zone total.

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	520.28 Ml/d	
SCENARIO 2 DEPLOYABLE OUTPUT	541.68 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	21.40 Ml/d	4 %
1997 WATER AVAILABLE FOR USE	527.08 Ml/d	

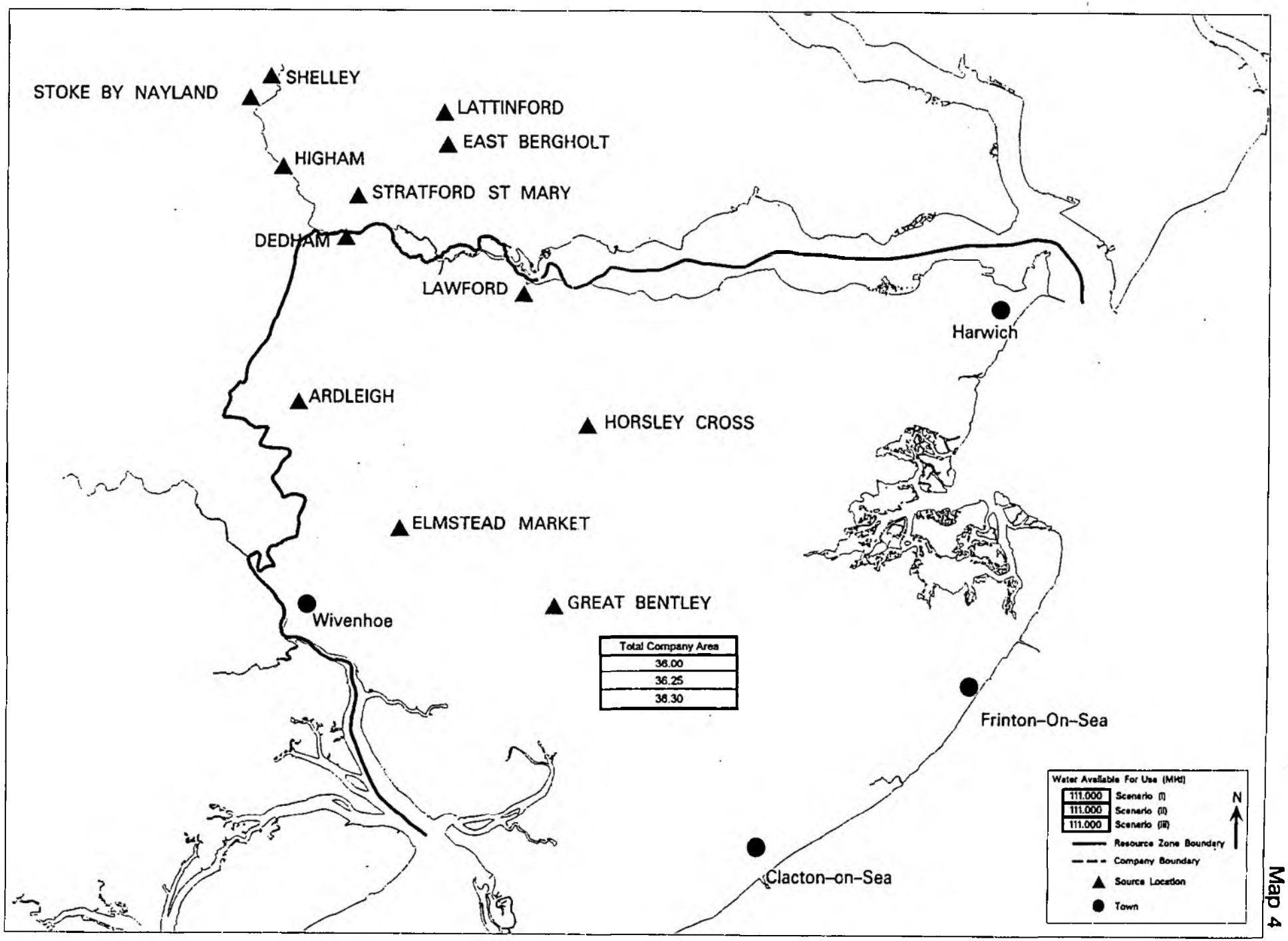
Tendring Hundred Water Services

Tendring Hundred provides supplies to a small part of Eastern Essex which covers the Tendring Peninsula and coastal resorts such as Clacton on Sea.

The company has an integrated system and operates its sources as a single zone. Approximately 75% of the company's yield is from groundwater sources with the remaining 25% provided from Ardleigh pumped storage reservoir. The reservoir yield is shared equally with Anglian Water Services and managed by a joint committee.

The yield from groundwater sources is slightly lower than previously, mainly due to exclusion of an unreliable gravel source from the new figures. However, a new source with a yield of 4 Ml/d has been developed; once licensed it will provide 2 Ml/d long term and an additional 2 Ml/d for the next 10 years bringing groundwater yields back up to similar levels to the previous figure.

The total yield of Ardleigh has reduced by about 10% and hence the company's share is reduced similarly. This change is due to the inclusion of emergency storage and changes to the way other abstractors in the catchment operate. Scenarios 2 and 3 produce deployable outputs about 3% higher than scenario 1, showing some benefit from demand restrictions during drought conditions.



Anglian Region

TENDRING HUNDRED SERVICES SUPPLY AREA

Map 4

TENDRING HUNDRED SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
COMPANY-WIDE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Ardleigh	9.55	9.80	9.85							
Run of River Schemes										
River Colne										
Groundwater Sources										
Chalk Boreholes					28.00	41.00				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	9.55	9.80	9.85		28.00	41.00	1.55	36.00	36.25	36.30

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	37.55		
	Scenario 2	37.80		
	Scenario 3	37.85		
	Change from Scenario 3 to Scenario 1		0.30 Ml/d	1 %
	Change from Scenario 3 to Scenario 2		0.05 Ml/d	0 %

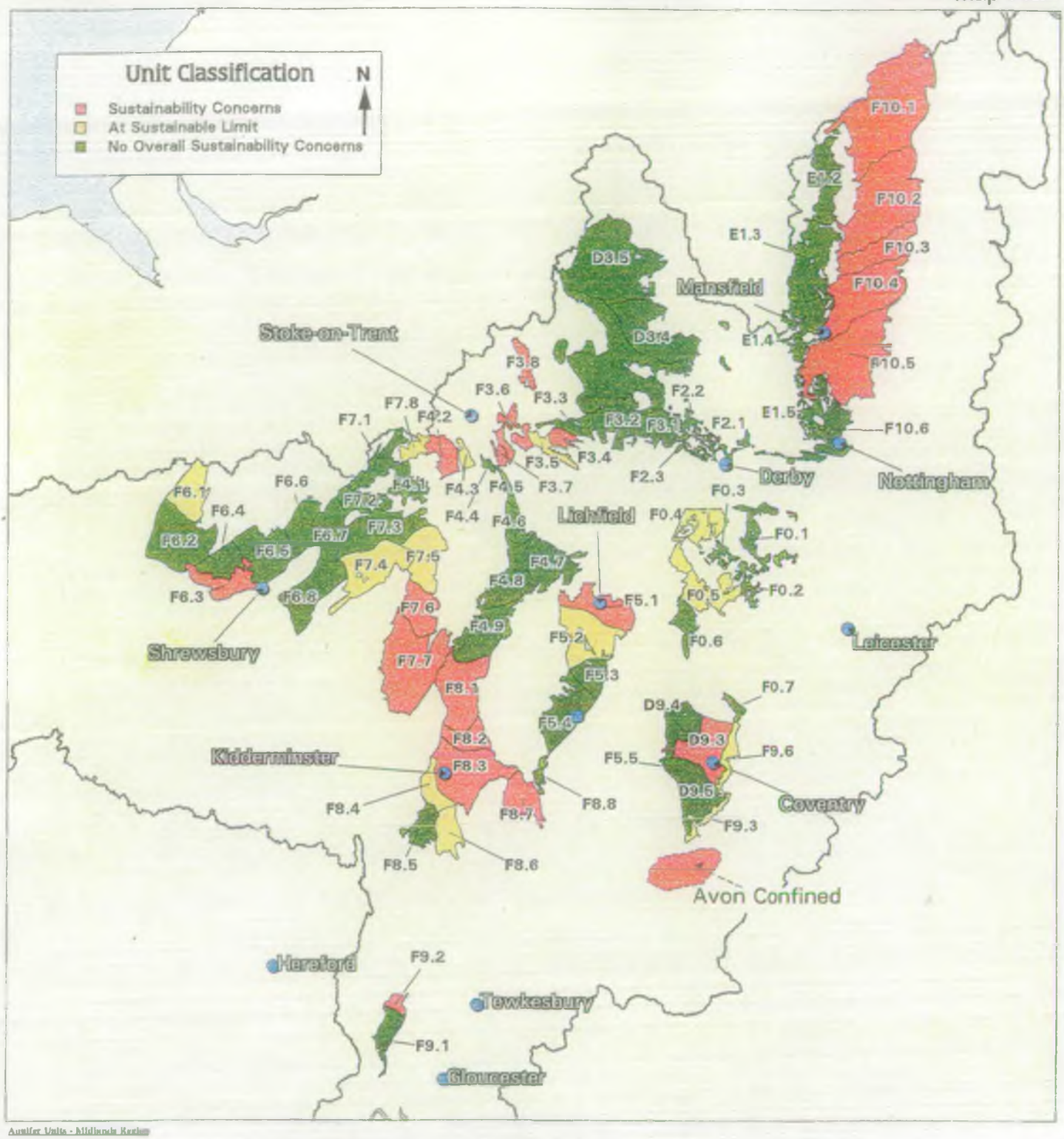
WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	42.20 Ml/d	
SCENARIO 2 DEPLOYABLE OUTPUT	37.80 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-4.40 Ml/d	-10 %
1997 WATER AVAILABLE FOR USE	36.25 Ml/d	

NOTES

1. Ardleigh reservoir shared equally between Tendring Hundred and Anglian Water Services
2. River Colne intake provides pumped supply to Ardleigh reservoir, so separate deployable output not reported

MIDLANDS REGION



Aquifer Units - Midlands Region

Trent Catchment: Sherwood Sandstones

Burton-on-Trent - Ashby-de-la-Zouch - Nuneaton	
F0.1	Dunsworth
F0.2	Coalville
F0.3	Ashby
F0.4	Burton
F0.5	Measham
F0.6	Warton
F0.7	Nuneaton
Derby Area	
F2.1	Derby North
F2.2	Muggington
F2.3	Kirk Langley
Stoke-on-Trent - Ashbourne	
F3.1	Shirley
F3.2	Mayfield
F3.3	Alton
F3.4	Grenagate
F3.5	Tean
F3.6	Forsbrook
F3.7	Spot
F3.8	Leek
Stoke-on-Trent - Stafford - Wolverhampton	
F4.1	Bishops Wood
F4.2	Hatton
F4.3	Thurmaston
F4.4	Outton
F4.5	Hurdlwick
F4.6	Hopson
F4.7	Rugeley
F4.8	Toddesley
F4.9	Coven
Lichfield - Birmingham	
F5.1	Lichfield
F5.2	Shenstone
F5.3	Sutton
F5.4	Birmingham
F5.5	Meriden
Severn Catchment: Sherwood Sandstones	
North Shropshire	
F6.1	Whittington
F6.2	Knockin
F6.3	Alderbury
F6.4	Ensdon
F6.5	Merrington
F6.6	Stanton
F6.7	Radmoor
F6.8	Longdon
East and South Shropshire	
F7.1	Market Drayton
F7.2	Wistanswick
F7.3	Sandbrook
F7.4	Adeney
F7.5	Aqueduct
F7.6	Croxford
F7.7	Warfield
F7.8	Wellings
West Midlands	
F8.1	Wombourne
F8.2	Stourbridge
F8.3	Kidderminster
F8.4	Stourport
F8.5	Astley
F8.6	Ombersley
F8.7	Bromsgrove
F8.8	Longbridge
Lower Severn and Avon	
F9.1	Oxenhall
F9.2	Bromsberrow
F9.3	Warwick
F9.4	Avon (Confined)
F9.6	Whitley
Nottingham - Doncaster	
F10.1	Hatfield
F10.2	Blyth
F10.3	Retford
F10.4	Thurnby
F10.5	Ravensbead
F10.6	Wallaton
Permo-Carboniferous (Coventry Area)	
D9.3	Coventry
D9.4	Meriden
D9.5	Kenilworth
Lower Mercasian Limestone	
E1.2	Maltby
E1.3	Bolsover
E1.4	Mansfield
E1.5	Hucknall
Carboniferous Limestone (Peak District)	
D3.3	Alstonefield
D3.4	Matlock
D3.5	Buxton

AQUIFER SUSTAINABILITY - Midlands Region

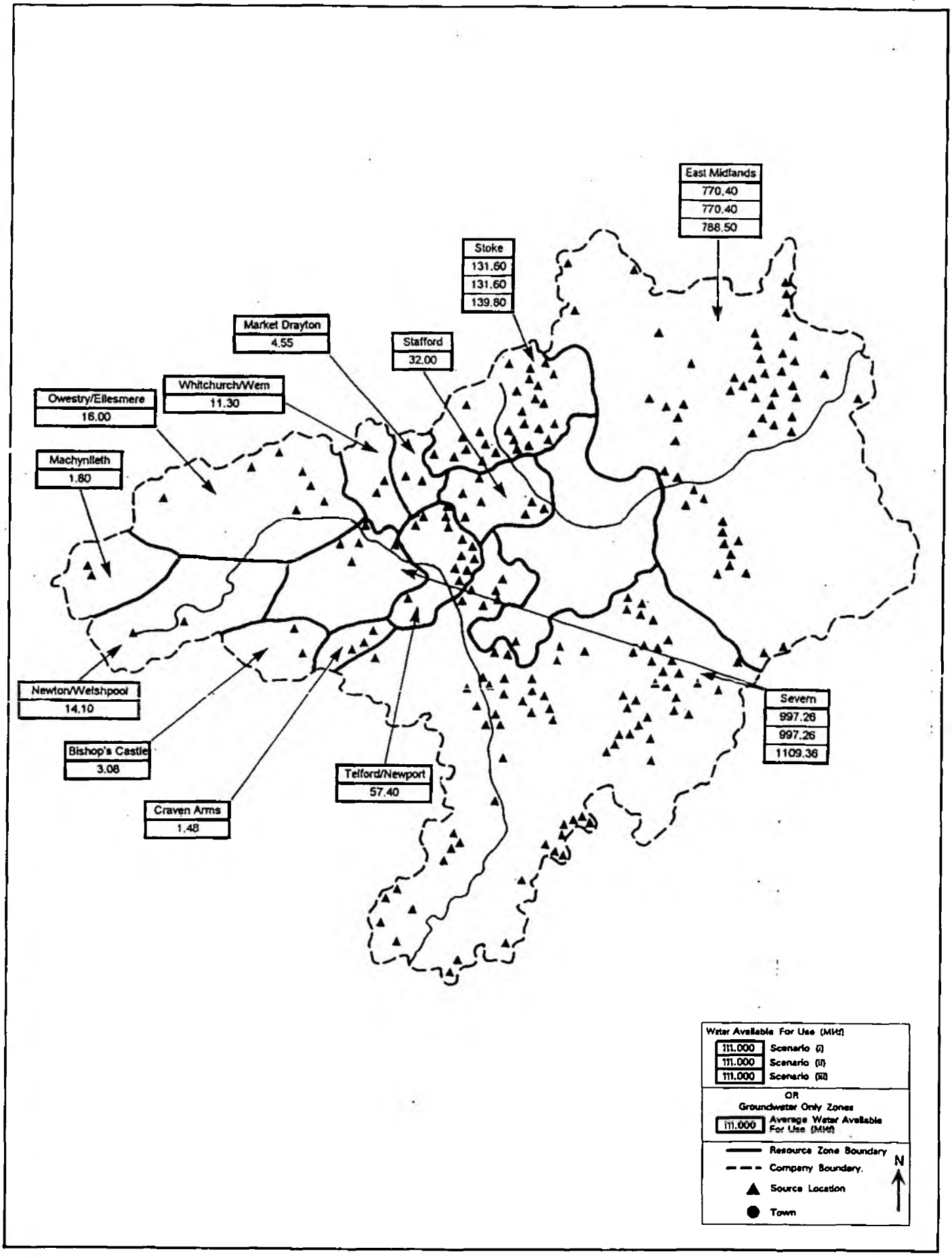
Severn Trent Water Ltd

The water company supply area has been subdivided into 12 resource zones. The three largest, where surface and groundwater sources are used conjunctively are: the East Midlands, the Severn (including Elan Valley reservoirs) and Stoke-on-Trent. The remainder are smaller zones largely dependent on groundwater. New resource simulation models were constructed for the East Midlands and Stoke-on-Trent zones, to facilitate modelling of resources in conjunctive use.

In the case of the Severn resource zone, the Agency modelled the River Severn System to calculate the deployable output in respect of the River Severn sources. However, further work would be required by the water company to simulate operation of the water supply system serviced by the sources within the Severn resource zone. Therefore the results for this zone must be treated as provisional at this stage.

In their submission the Company reported a deployable output of 2162 Ml/d for their resources. This equates to the values reported for scenario 1 and reflects the Company's view that existing licensed quanities from the River Severn could not be guaranteed in the worst historic drought without the possibility of customer restrictions. The figure of 2261 Ml/d, shown as an alternative value for scenario 2, reflects the Agency's view of deployable output from the River Severn under the current operating practice. This figure is almost identical to the previous value of 2263 Ml/d reported in 1994 as part of the NRA's National Water Resources Strategy. The reported deployable outputs are reduced by a further 6% with an allowance for outages which is higher than the typical value for other water companies and may require further scrutiny. The deployable output available from the River Severn will be reviewed as the water resources plan is developed. This would take into account the results of the further modelling work, the development of phases 4 and 5 of Shropshire Groundwater Scheme, worth approximately 60 Ml/d, and any changes to drought management rules for the River Severn promoted by the Agency.

Overall, this reassessment has provided a sound base of information for the company to use in the development of its water resources plan. The main reservation is in relation to the results for the Severn resource zone for which further modelling work is planned and where further discussion is required with the Agency regarding interpretation of results.



Midlands Region
SEVERN TRENT WATER SUPPLY AREA

SEVERN TRENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
BISHOP CASTLE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Bishop Castle					3.58	4.68			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					3.58	4.68	0.50	3.08	4.18

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	3.58
	Peak Week	4.68
WATER AVAILABLE FOR USE (Ml/d)	Average	3.08
	Peak Week	4.18

NOTES

1. This is a groundwater only resource zone, so results for surface water scenarios not reported.

SEVERN TRENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
CRAVEN ARMS	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Craven Arms					1.78	2.12			
Imports and Exports									
None									
RESOURCE ZONE TOTAL	0.00	0.00	0.00	0.00	1.78	2.12	0.30	1.48	1.82

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	1.78
	Peak Week	2.12
WATER AVAILABLE FOR USE (Ml/d)	Average	1.48
	Peak Week	1.82

NOTES

1. This is a groundwater only resource zone, so results for surface water scenarios not reported.

SEVERN TRENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
EAST MIDLANDS	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Charnwood	25.00	25.00								
River Dove	191.20	191.20								
River Derwent	359.00	359.00	373.00							
Run of River Schemes										
(See notes)										
Groundwater Sources										
Coalville Group					2.63	3.80				
Derby					6.50	7.10				
Milton					0.00	0.00				
North Derby					2.96	3.66				
Nottingham, Newark & Mansfield					182.60	258.10				
South Leicestershire					1.39	1.51				
Worksop					23.50	30.03				
Imports and Exports										
Treated Water Import from Anglian Water (Rutland)	17.00	17.00	17.00							
RESOURCE ZONE TOTAL					219.58	304.20	40.60	770.40	770.40	788.50

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	811.00		
	Scenario 2	811.00		
	Scenario 3	830.00		
	Change from Scenario 3 to Scenario 1		19.00 Ml/d	2.34 %
	Change from Scenario 3 to Scenario 2		19.00 Ml/d	2.34 %

NOTES

1. Run of river schemes included in conjunctive surface water systems
2. Total deployable output and water available for use figures based on conjunctive use modelling of the East Midlands system. Therefore individual deployable outputs of listed sources may not aggregate to the total figures

SEVERN TRENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
MACHYNLLETH	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
Nant Esgaireira	0.34	0.34							
Run of River Schemes									
None									
Groundwater Sources									
Llanwrin					1.76	2.17			
Imports and Exports									
0.83 Ml/d Transfer to DCWW (Corris/Pennal)									
RESOURCE ZONE TOTAL	0.34	0.34			1.76	2.17	0.30	1.80	2.21

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	2.10
	Peak Week	2.51
WATER AVAILABLE FOR USE (Ml/d)	Average	1.80
	Peak Week	2.21

NOTES

1. Run of river schemes included in conjunctive surface water systems

SEVERN TRENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
MARKET DRAYTON	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Market Drayton					5.35	6.40			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					5.35	6.40	0.80	4.55	5.60

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	5.35
	Peak Week	6.40
WATER AVAILABLE FOR USE (Ml/d)	Average	4.55
	Peak Week	5.60

NOTES

1. This is a groundwater only resource zone, so results for surface water scenarios not reported.

SEVERN TRENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
NEWTON/WELSHPOOL	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Llandinam					16.00	17.00			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					16.00	17.00	1.90	14.10	15.10

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	16.00
	Peak Week	17.00
WATER AVAILABLE FOR USE (Ml/d)	Average	14.10
	Peak Week	15.10

NOTES

1. This is a groundwater only resource zone, so results for surface water scenarios not reported.

SEVERN TRENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
OSWESTRY/ELLESMERE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Oswestry					18.00	24.00			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					18.20	23.60	2.20	16.00	21.40

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	18.20
	Peak Week	23.60
WATER AVAILABLE FOR USE (Ml/d)	Average	16.00
	Peak Week	21.40

NOTES

1. This is a groundwater only resource zone, so results for surface water scenarios not reported.

SEVERN TRENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
SEVERN	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Dodeswell	1.30	1.30	1.30							
Draycote/Campion	42.30	42.30	43.40							
Mitcheldean	30.70	30.70	30.70							
Whitacre	34.20	34.20	40.20							
Run of River Schemes										
Severn - Hampton Loade	45.00	(59.00) 45.00	60.00							
Severn - Mythe	90.00	(118.00) 90.00	119.00							
Severn - Shelton	19.00	(24.00) 19.00	25.00							
Severn - Strensham	124.00	(162.00) 124.00	164.00							
Severn - Trimpley	45.00	(59.00) 45.00	60.00							
Groundwater Sources										
Astley					8.00	12.00				
Birmingham					0.00	0.00				
Coventry					31.80	34.30				
East Worcestershire					56.40	81.90				
Forest of Dean					10.80	14.50				
Gloucester					1.14	1.14				
Kidderminster					25.40	29.50				
Malvern					12.30	14.10				
Shelton					13.00	18.00				
S Gloucester and Stroud					9.49	9.49				
South Shropshire					0.25	0.25				
Stourbridge					15.60	16.30				
Stratford					6.50	8.00				
Warwick					8.06	9.61				
West Shropshire					9.60	10.60				
Wolverhampton					79.90	87.90				
Worcs. Cotswold Springs					3.02	3.02				
Imports and Exports										
Elan Valley Import	327.00	327.00	327.00							
9 Ml/d Transfer to Welsh Water (Ross on Wye)										
RESOURCE ZONE TOTAL	758.50	(857.50) 758.50	870.60		291.26	350.61	52.50	997.26	(1096.26.00) 997.26	1109.36

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Scenario 1	1049.76	Change from Scenario 3 to Scenario 1 (Ml/d, %)	112.10 Ml/d	11 %
	Scenario 2	1049.76 (1148.76)	Change from Scenario 3 to Scenario 2 (Ml/d, %)	112.10 Ml/d	11 %
	Scenario 3	1161.86			

NOTES

1. Scenarios 1 and 2 reflect the Company's view of deployable output from the River Severn to meet stated standards of service to customers. An alternative scenario 2 is shown in brackets which reflects the Agency's view of deployable output from the River Severn according to the current operating guidelines.
2. Scenario 3 values are provisional until the completion of the conjunctive use model.

SEVERN TRENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
STAFFORD	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Stafford					36.40	39.60			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					36.40	39.60	4.40	32.00	35.20

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	36.40
	Peak Week	39.60
WATER AVAILABLE FOR USE (Ml/d)	Average	32.00
	Peak Week	35.20

NOTES

1. This is a groundwater only resource zone, so results for surface water scenarios not reported.

SEVERN TRENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
STOKE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Ladderedge	39.40	39.40	40.80							
Run of River Schemes										
None										
Groundwater Sources										
Hanchurch					50.40	61.80				
Meir					48.70	52.00				
Coopers Green					20.00	23.00				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	39.40	39.40	40.80		119.10	136.80	11.40	131.60	131.60	139.80

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Scenario 1	143.00	
	Scenario 2	143.00	
	Scenario 3	152.00	
	Change from Scenario 3 to Scenario 1	9.00 Ml/d	6.29 %
	Change from Scenario 3 to Scenario 2	9.00 Ml/d	6.29 %

NOTES

1. Total deployable and water available for use figures based on conjunctive use modelling of the Stoke system. So individual deployable output of sources listed may not aggregate to total figures

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
TELFORD/NEWPORT	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Telford/Newport					62.40	80.60			
Imports and Exports									
None									
RESOURCE ZONE TOTAL				0.00	62.40	80.60	5.00	57.40	75.60

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	62.40
	Peak Week	80.60
WATER AVAILABLE FOR USE (Ml/d)	Average	57.40
	Peak Week	75.60

NOTES

1. This is a groundwater only resource zone, so results for surface water scenarios not reported.

SEVERN TRENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
WHITCHURCH/WEM	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Whitchurch/Wem					12.90	14.60			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					12.90	14.60	1.60	11.30	13.00

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	12.90
	Peak Week	14.60
WATER AVAILABLE FOR USE (Ml/d)	Average	11.30
	Peak Week	13.00

NOTES

1. This is a groundwater only resource zone, so results for surface water scenarios not reported.

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	2263.10 Ml/d	
SCENARIO 2 DEPLOYABLE OUTPUT	2162.47 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-100.63 Ml/d	-4 %
1997 WATER AVAILABLE FOR USE	2040.97 Ml/d	

South Staffordshire Water Ltd

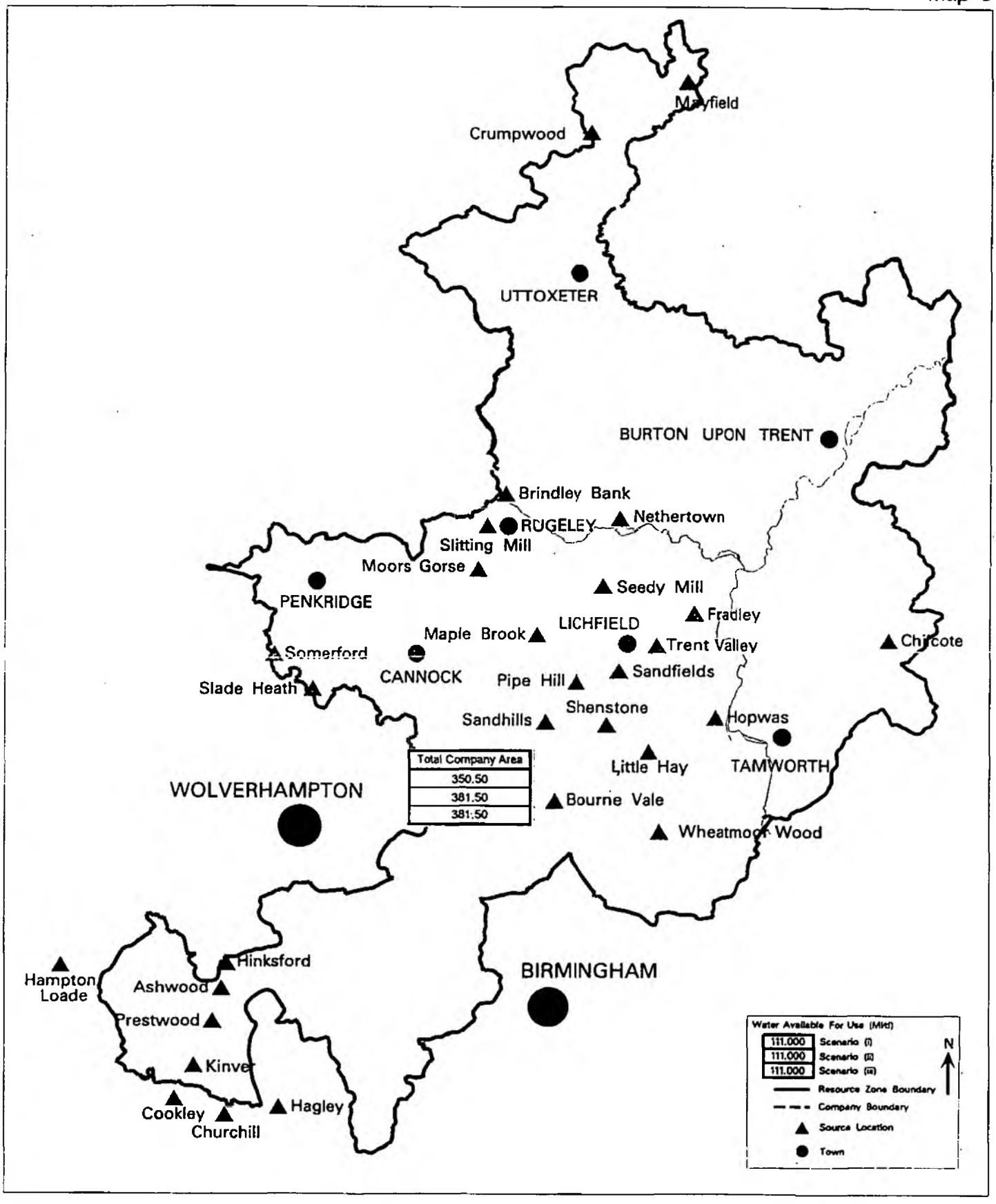
The company area forms one resource zone, with groundwater providing approximately half of the total supplies as a baseload. The River Severn is used to supply about a third of the supply requirement, and the remainder is met by abstractions from the Blithfield Reservoir. There is some scope for conjunctive use of resources, largely between the River Severn and Blithfield reservoir. However, in the time available for the current exercise, it has only been possible to construct a simple spreadsheet model based on the results for the individual source yield assessments to reflect the conjunctive use opportunities.

The deployable output reported for the company's resources of 390 Ml/d is higher than the previous estimate made in 1994 largely as a result of increases in deployable outputs for Blithfield Reservoir and abstraction from the River Severn. However, it should be noted that to survive beyond the worst historic drought on the River Severn without a drought order, the deployable output could be around 30 Ml/d less. An allowance of 8.5Ml/d for outages has been made leaving 382 Ml/d as water available for use to meet the company's standard of service to customers.

There were no real surprises from the reassessment of groundwater yields, although it is interesting to note that the total average day peak week deployable output is only less than 5% greater than the average deployable output.

The company's stated standard of service is to meet supply demands at all times with no customer restrictions. For Blithfield reservoir, a yield assessment was made for the Agency reference scenario to illustrate the sensitivity of the results to changes in standards of service criteria. This appeared to make very little difference to the deployable output. This is thought to be due a combination of the modelling methodology employed, and the relatively short periods of the demand restrictions.

The results of the current assessment provides a sound basis for the company to move forward in developing its water resources plan. It should be acknowledged however, that there is some uncertainty as to the deployable output from the River Severn in the worst drought, as there is no guarantee that the assumed drought order conditions would be exactly the same as those in the assumptions made for the current exercise.



Midlands Region
SOUTH STAFFORDSHIRE SUPPLY AREA

SOUTH STAFFORDSHIRE WATER COMPANY

RESOURCE ZONE/SOURCE DESCRIPTION		SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
COMPANY-WIDE		*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs											
	Blithfield	53.00	53.00	53.00							
	Hampton Loade	114.00	142.00	142.00							
Run of River Schemes											
	None										
Groundwater Sources											
	Alton					5.75	7.45				
	Chilcote					7.25	8.00				
	Coven					7.05	7.64				
	East Sutton					3.00	3.00				
	Fradley					10.00	12.00				
	Hopwas					2.45	3.40				
	Mayfield					0.52	0.82				
	Rugely					26.62	27.33				
	Shenstone					37.80	37.80				
	Stourbridge					84.91	85.49				
	Trent Valley					15.98	15.98				
Imports and Exports											
	None										
RESOURCE ZONE TOTAL		167.00	195.00	195.00		201.33	208.91	8.50	350.50	381.50	381.5

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Scenario 1	359.00		
	Scenario 2	390.00		
	Scenario 3	390.00		
	Change from Scenario 3 to Scenario 1		31.00 Ml/d	9 %
	Change from Scenario 3 to Scenario 2		0.00 Ml/d	0 %

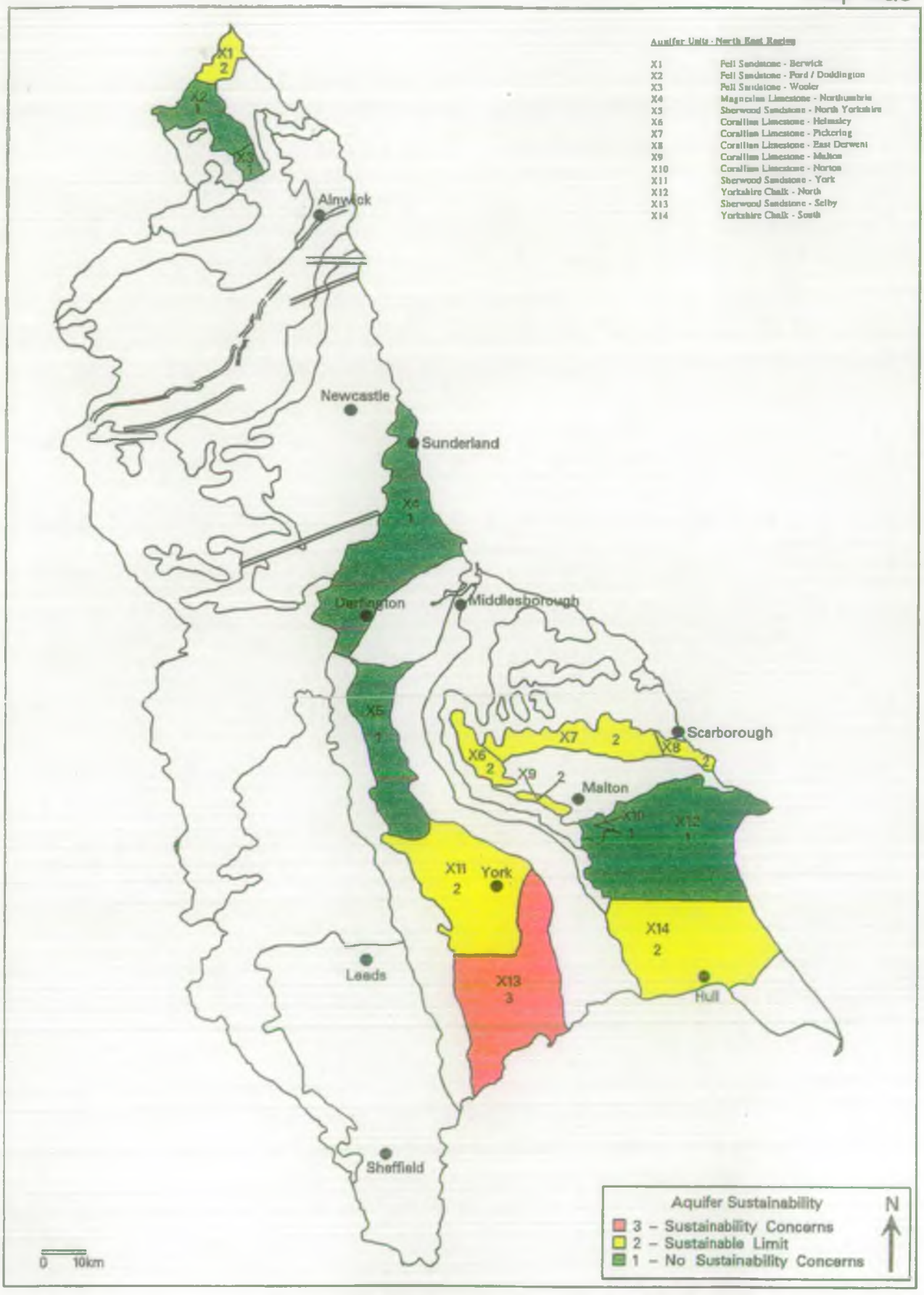
WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	356.90 Ml/d	
SCENARIO 2 DEPLOYABLE OUTPUT	390.00 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	33.10 Ml/d	9 %
1997 WATER AVAILABLE FOR USE	381.50 Ml/d	

NOTES

1. Total deployable output and water available for use figures based on conjunctive use modelling at the resource zone level. Therefore individual deployable outputs of listed sources may not aggregate to the total deployable output figures

NORTH EAST REGION



AQUIFER SUSTAINABILITY - North East Region

Hartlepool Water

The company has two resource zones, but with one zone supplying all of the water to drinking water standards and the other supplying non-potable water to industry.

The potable zone obtains its water from the Magnesian Limestone aquifer to the north and the west of Hartlepool. The Deployable Output of many of the boreholes is restricted not by a lack of water in a drought but by the hardness of the water. For this reason the new estimates are little different to the old values. The lowest levels in the aquifer were experienced in the past when mine dewatering lowered the levels in this aquifer. When the mines closed the water level rose significantly in the aquifer.

There are a few sources where information is inadequate to extrapolate reliably beyond historic pumping rates to determine the upper limit of the DO. In these cases a lower value based on experience has been used. In time as these data become available, higher DOs should be achievable from some of these sources

The water for the non-potable zone is supplied from two small reservoirs and a single borehole. The water is supplied to industrial customers who do not require water treated to drinking water standards. The company does not have treatment works to use any spare water from this zone in their potable resource zone. As scenario 3 is designed for zones with largely domestic customers, it is not applicable in this case and has not been simulated. The company's Standard of Service is for no restrictions, which gives the same DO as for scenario 1.

North East Region

Hartlepool Water Supply Area

Map 9

HARTLEPOOL WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
POTABLE SUPPLY	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Dalton Piercey					11.00	18.00			
Amerston Hall					6.00	6.00			
Waterloo					4.60	4.60			
Hopper House					3.60	3.60			
Hope House					2.80	2.80			
Stillington					8.00	8.00			
Great Stainton					6.80	9.00			
Coal Lane					4.60	4.60			
Crookfoot					1.10	1.10			
Red Barns					2.30	2.30			
Leechmire					0.00	0.00			
Naisberry					0.00	0.00			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					50.80	60.00	5.08	45.72	54.92

TOTAL DEPLOYABLE OUTPUT	Average	50.80 Ml/d
	Peak Week	60.00 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	45.72 Ml/d
	Peak Week	54.92 Ml/d

HARTLEPOOL WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
NON-POTABLE SUPPLY	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Crookfoot & Hurworth Burn	3.71	3.71	3.71							
Run of River Schemes										
None										
Groundwater Sources										
Sapper's Corner					1.00	3.60				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	3.71	3.71	3.71	0.00	1.00	3.60	0.24	4.47	4.47	4.47

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Scenario 1	4.71		
	Scenario 2	4.71		
	Scenario 3	4.71		
	Change from Scenario 3 to Scenario 1		0.00 Ml/d	0 %
	Change from Scenario 3 to Scenario 2		0.00 Ml/d	0 %

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	51.00 Ml/d	
SCENARIO 2 DEPLOYABLE OUTPUT	55.51 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	4.51 Ml/d	9 %
1997 WATER AVAILABLE FOR USE	50.19 Ml/d	

Northumbrian Water

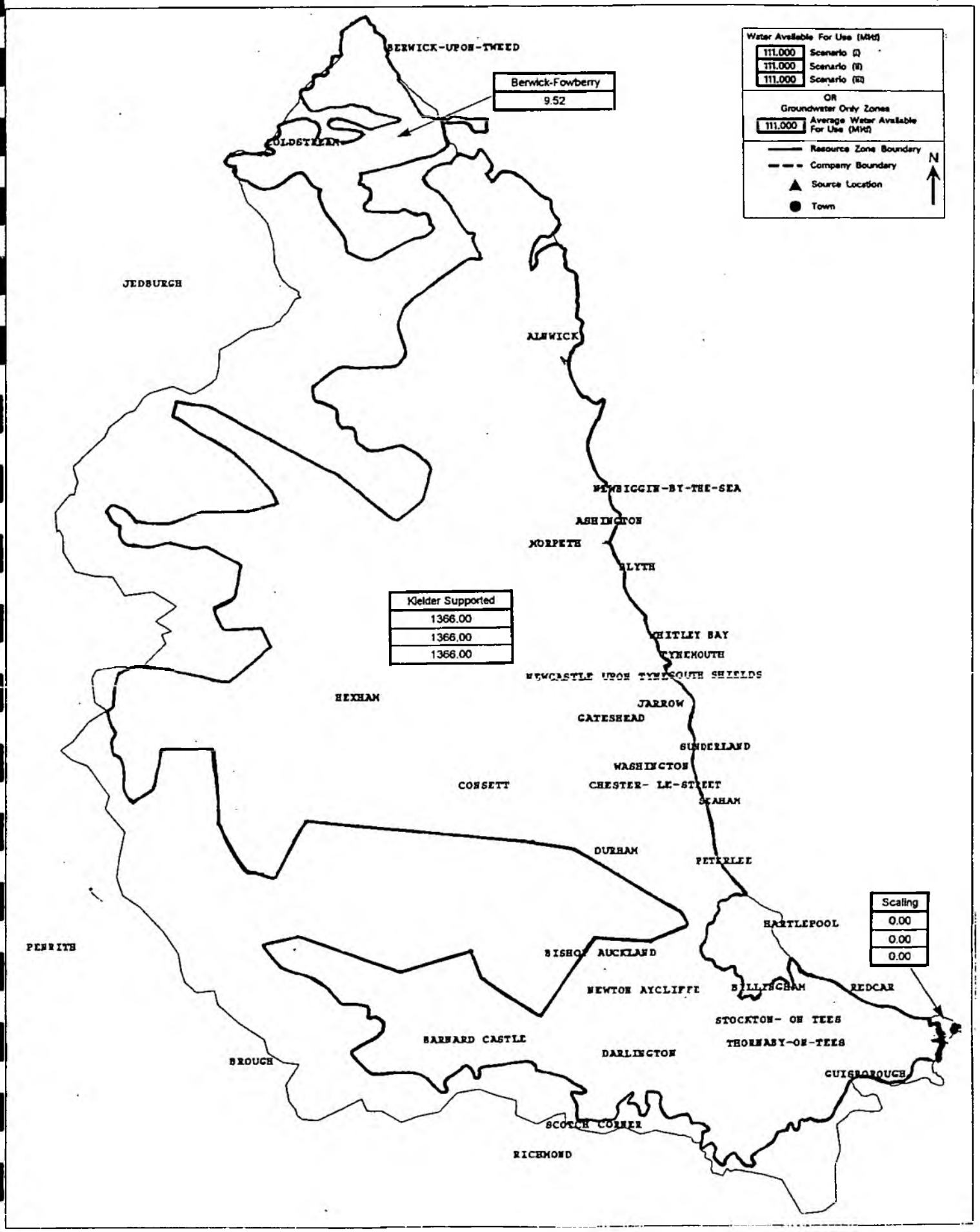
The company has three resource zones, but the Kielder supported zone covers the vast majority of their area extending from the Tyne to the Tees. The second zone is in the far North supplying Berwick and surrounding areas from groundwater supplies, with the last zone being a separate small reservoir in the extreme south east of their area, which has been exporting water to Yorkshire.

The company has large intakes on the three main rivers in their area - the Tyne, Wear and Tees - which are all supported by Kielder, as necessary. The distribution system allows this water to reach all parts of this resource zone either directly or by substitution. Currently the Deployable Output of this zone is restricted by the licences held by the company rather than by a lack of resources: even in the worst drought on record only a small part of Kielder reservoir has been used to meet the demands.

The company's Standard of Service is for no restrictions. The hosepipe ban and drought control lines on Kielder are not reached in any of the historic droughts resulting in the same Deployable Output as for scenario 2. Scenario 1 also gives the same DO.

Previous estimates of the yield have not modelled this system as a whole but individual source yields are available. The sum of these individual source yields gives a total which is little different to the new value of DO.

The Berwick/Fowberry resource zone obtains water from the Fell Sandstone aquifer which stretches from Berwick past Wooler and on towards Kielder. It is a complex multi-layered aquifer which as a whole is little developed but with full utilisation locally, specifically around Berwick. The Outage value has not yet been agreed with the Agency.



North East Region

NORTHUMBRIA WATER SUPPLY AREA

NORTHUMBRIAN WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
BERWICK -FOWBERRY	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None.									
Run of River Schemes									
None									
Groundwater Sources									
Dock Road Borehole					0.00	0.00			
Murton Borehole					3.44	3.44			
Thornton Mains Borehole					1.65	1.84			
Fowberry Borehole					2.22	3.12			
Thornton Bog Borehole					5.70	6.00			
Holy Island Borehole					0.11	0.11			
Imports and Exports									
None									
RESOURCE ZONE TOTAL				0.00	13.12	14.51	3.60	9.52	10.91

TOTAL DEPLOYABLE OUTPUT	Average	13.12 Ml/d
	Peak Week	14.51 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	9.52 Ml/d
	Peak Week	10.91 Ml/d

NOTES

1. Outage figures not calculated by water company, so water available for use to be equal to total deployable output

NORTHUMBRIAN WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
KIELDER SUPPORTED	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Fontburn Reservoir										
Catcleugh Reservoir										
Colt Crag Reservoir										
Little Swinburn Reservoir										
East Hallington Reservoir										
West Hallington Reservoir										
Whittledene Reservoir										
Derwent Reservoir										
Airy Holm Reservoir										
Burnhope Reservoir										
Waskerley Reservoir										
Tunstall Reservoir										
Smiddyshaw Reservoir										
Hisehope Reservoir										
Grassholme Reservoir										
Selset Reservoir										
Blackton Reservoir										
Hury Reservoir										
Balderhead Reservoir										
Lockwood Beck Reservoir										
Run of River Schemes										
Sandyford Springs				0.36						
Half Moon Springs				0.29						
Shirlaw Hope Springs				0.18						
Swan Well Springs				0.53						
River Coquet										
Cartington Springs				1.53						
Tosson Springs				3.20						
Routing Burn										
Seal Burn										
Black Burn										
Thirston Springs				0.00						
Cambo Springs				0.12						
River Wansbeck										
River Pont Intake										
Barrasford Support										
River Tyne (Wylam)										
SUB TOTAL										

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)			WATER AVAILABLE FOR USE (Ml/d)		
KIELDER SUPPORTED (Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*		
SUB TOTAL (See Previous Page)												
Run of River Schemes (Contd.)												
River Tyne (Barrasford Transfer)												
Nine Eyes Well				0.01								
Colwell Springs				0.00								
Unnamed Stream												
Parkgates Spring												
Staggyford Spring				0.06								
Allenheads Springs				0.02								
Halton Lea Gate				0.03								
Birchtrees Spring 1												
Birchtrees Spring 2												
Starwood Spring												
Ellrington Spring												
Birchtrees Spring 3												
Currick Spring				0.01								
River Tyne												
Ladlewell Spring 1												
Ladlewell Spring 2												
Ladlewell Spring 3												
Moorgate Spring												
Cocklake Spring No 1												
Cocklake Spring No 2												
River Tyne (Hexham)												
Tyne Tees Tunnel												
Presser & Burnhead												
Boltslaw & Sykehead												
Spring Frosterley												
Hill end Frosterley												
Stanhope												
Crawley, Stanhope												
Keepers Lodge												
Windyside												
St John's Chapel												
Grove Heads Mine												
Lanehead												
SUB TOTAL												

NORTHUMBRIAN WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
KIELDER SUPPORTED (Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*	
SUB TOTAL (See Previous Page)				
Run of River Schemes (Contd.)				
Copley				0.20
Raby Castle				0.17
River Wear				
River Tees				
Carlton Spring				0.10
Scugdale No 1				
Scugdale No 2				
Scugdale No 3				
Scugdale No 4				
Scugdale No 5				
Kildale Spring No 1				
Kildale Spring No 2				0.02
Turkey Nab				
One of These Sisters				
Hare Dale Springs				
Oven Close Spring				
Groundwater Sources				
Gubson Boreholes				
Cambo Borehole				
Tranwell Borehole				
Stonehaugh Borehole				
Cleadon				
Stonygate				
Fullwell				
Broken Scar Borehole				
Seaton				
North Dalton				
Thorpe				
Dalton				
Ryhope				
Peterlee				
Hawthorn				
New Winning				
Mill Hill				
Bleak Ridge				
SUB TOTAL				

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
Average	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
0.05					
0.86					
0.00	0.00				
3.81					
5.01	5.46				
9.10	18.20				
	1.12				
10.24	12.25				
4.00	4.00				
5.77	6.77				
0.00					
3.30	3.70				
6.31	7.11				
1.70					
2.10	2.40				

NORTHUMBRIAN WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
KIELDER SUPPORTED (Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
SUB TOTAL (See Previous Page)										
Groundwater Sources (Contd.)										
Burdon					0.00					
Imports and Exports										
RESOURCE ZONE TOTAL (See Notes)	1418.00	1418.00	1418.00				52.00	1366.00	1366.00	1366.00

TOTAL DEPLOYABLE OUTPUT (Ml/d)

Scenario 1	1418.00	
Scenario 2	1418.00	
Scenario 3	1418.00	
Change from Scenario 3 to Scenario 1	0.00 Ml/d	0 %
Change from Scenario 3 to Scenario 2	0.00 Ml/d	0 %

NOTES

1. Water available for use figures are 'yield restricted' figures, not 'licence restricted'.
2. Area deployable outputs are noted as: Tyne 309 Ml/d, Wear - 334 Ml/d, Tees - 775 Ml/d
3. In general, individual deployable outputs for sources have not been provided, and have therefore not been reported.

NORTHUMBRIAN WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
SCALING	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*			*Average*	*Average Day Peak Week*
Reservoirs										
Scaling Reservoir	5.00	5.00	5.00							
Run of River Schemes										
None										
Groundwater Sources										
None										
Imports and Exports										
None										
RESOURCE ZONE TOTAL (See Notes)	5.00	5.00	5.00				5.00	0.00	0.00	0.00

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Scenario 1	5.00		
	Scenario 2	5.00		
	Scenario 3	5.00		
	Change from Scenario 3 to Scenario 1		0.00 Ml/d	0 %
	Change from Scenario 3 to Scenario 2		0.00 Ml/d	0 %

NOTES

1. Although water available for use is zero, in practice this zone is linked to the Kielder supported zone, and all demands can be met from that zone.

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	1474.00 Ml/d	
SCENARIO 2 DEPLOYABLE OUTPUT	1436.12 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-37.88 Ml/d	-3 %
1997 WATER AVAILABLE FOR USE	1375.52 Ml/d	

Yorkshire Water Services

The company has four resource zones - the Grid zone which supplies the large majority of their customers, and three zones covering the northern, rural parts of their area: the Dales and the East groundwater zones and the East surface water zone, which supplies Whitby and the surrounding area in the north east of the company's area from the River Esk and other local sources.

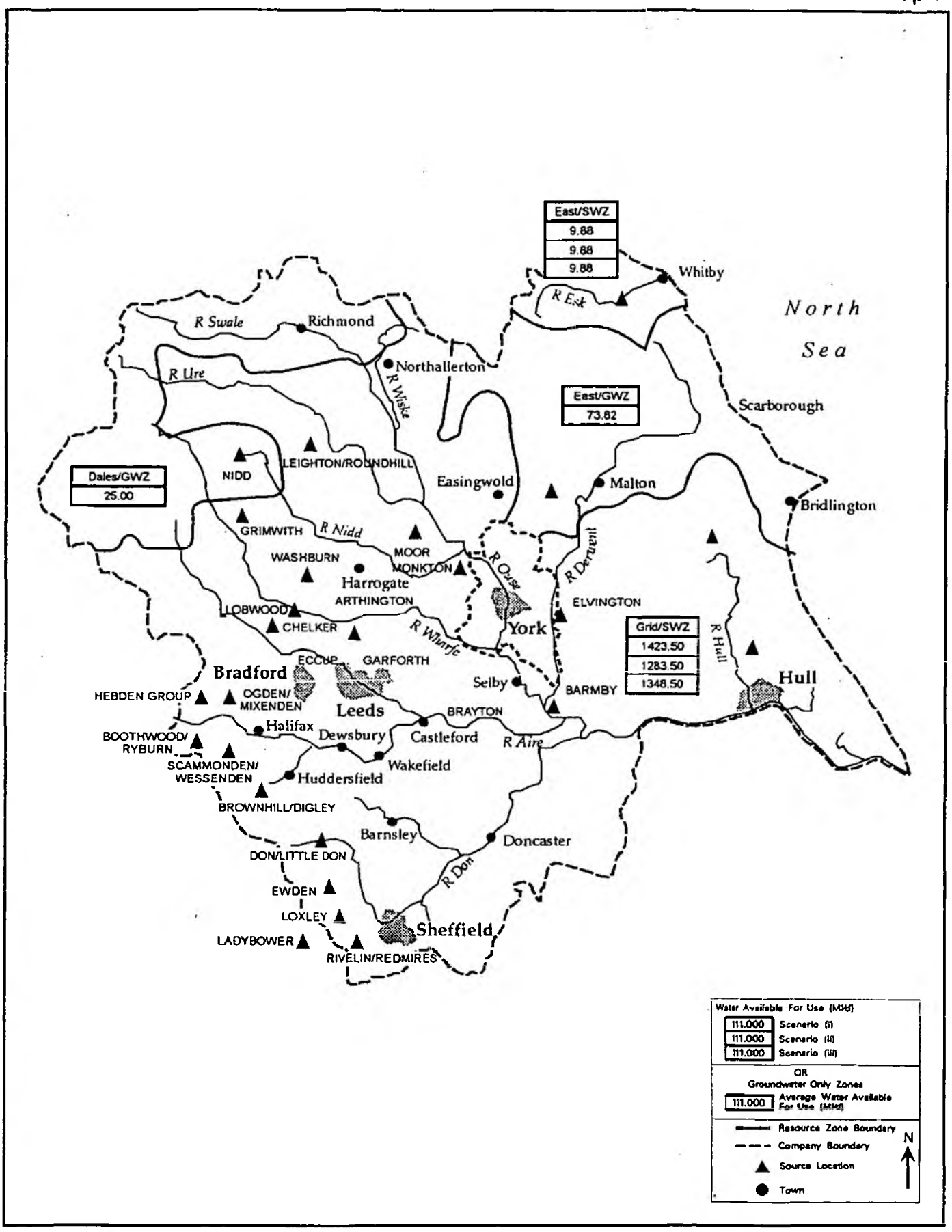
Following the drought of 1995/96 YWS reassessed the yield of their Grid using a methodology very similar to that recommended for this study; the results were reported in their Economic Level of Leakage Report, 1997. For their chosen Standard of Service (scenario 2) the DO has now been reduced by 26 Ml/d from the value reported earlier in 1997. This further reduction is due to the simulated period being extended to include droughts in the 1920s and 1930s, improved Grid links to rural areas, and the modelling of seasonal demand variations.

There are still opportunities to refine the operation of the Grid sources to achieve a higher DO so that some or all of this reduction may be recovered. The operation of the many sources included within the Grid is a complex management task and it may take some time to refine it to achieve any additional output.

The DO for scenario 3 is 5% higher than scenario 2, which indicates the trade-off between increasing the DO by reducing the Standard of Service to the customers. The DO for scenario 1 is significantly higher than for scenario 2 (10%). It is more closely related to a traditional hydrological yield which can not necessarily be delivered in practice as it effectively assumes knowledge of when a drought sequence will end. In reality restrictions on customers' use have to be implemented at some point to safeguard supplies in the event that the drought continues beyond historic end dates, as happened in 1996 in Yorkshire. The Outage value is still under discussion with the Agency.

The Deployable Outputs for the two rural, groundwater supplied resource zones - the Dales and the East zones - have increased slightly, due largely to the different assumptions used in applying the UKWIR methodology. There are a number of sources where information is inadequate to extrapolate reliably beyond historic pumping rates to determine the upper limit of the DO. In these cases the lower value that has been observed has been used. In time as these data become available, higher DOs should be achievable from some of these sources. Outage has not been estimated to determine the Water Available for Use.

The Deployable Output for the Esk resource zone has increased only marginally over the old value. Imported water from the Northumbrian Water's Scaling resource zone has not been included in the assessment, although water has been imported in the past. Outage has not been estimated to determine the Water Available for Use.



WEWCYD01c/PN/26.11.97

North East Region
YORKSHIRE WATER SUPPLY AREA

YORKSHIRE WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
GRID\SWZ	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Cod Beck										
Laver Intakes										
Burn Intakes										
Leighton										
Haverah Park										
Washburn Valley										
Boltby										
Redmires										
Rivelin										
Loxley/Damflask										
Ewden/Morehall										
Don Valley, Scout Dyke										
Little Don/Underbank										
Winscar Group										
Boothwood/Ryburn Group										
Green Withens										
Withens Clough										
Wessenden Valley										
Scammonden Group										
Deerhill/Blackmoorfoot										
Brownhill/Digley Group										
Luddeden Group										
Gorpley										
Bradford Group										
Scar House/Angram (Nidd)										
Chelker										
Upper & Lower Barden										
Robin Hood CW										
Greeehouse Tunnel										
Burbsall Springs										
Reva										
Old Reservoir										
Ilkley Springs										
March Ghyll (Not in Use)										
Worth Valley										
Silsden WTW										
Elslack										
Run of River Schemes										
SUB TOTAL (See Notes)										

YORKSHIRE WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
GRID\SWZ(Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Run of River Schemes (Contd.)				
Moor Monkton - Eccup, Huby & Elvington				
Arthington				
Thornton Steward				
River Hull and West Beck				
Lobwood(Bfd)				
Lobwood(Craven)				
Hollins				
River Derwent				
Groundwater Sources				
Angram Boreholes				
Carlsmoor Tunnel				
Kepwick Springs				
Ainderby Steeple				
Sandhutton BH				
Addleborough				
Askrigg				
Carperby				
Countersett				
Fossdale				
Gayle				
Horsehouse				
Caldbergh				
Sowden Beck				
Marsett				
Newbiggin				
Stalling Busk				
West Burton				
Bellerby BH				
Agra				
Cranehow Bottom				
Ellingstring				
Ilton				
Middleham				
Pickhill BH				
Cottingham BH				
Dunswell BH				
Keldgate BH				
Springhead BH				
SUB TOTAL (See Notes)				

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
Average	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
3.60	3.60				
1.69	2.95				
4.82	6.00				
0.43	0.65				
0.00	0.00				
0.31	0.62				
0.01	0.01				
0.01	0.03				
0.29	0.56				
0.01	0.02				
0.01	0.02				
	2.52				
0.30	0.61				
0.42	0.56				
0.00					
0.05	0.05				
0.00	0.00				
0.88	0.88				
11.35	17.80				
24.48	24.86				
5.36	13.75				
11.93	14.68				

YORKSHIRE WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
GRID\SWZ(Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Groundwater Sources (Contd.)				
Swanland BH				
Imswell Wold, Spellowgate, Driffield/North End				
Elton				
Hutton Cranswick				
Kilham				
Millington Spring				
Newbald BH				
Springwells				
Sherburn Spring				
Brayton North				
Carlton (Mill Lane)				
Cowick				
Eggborough				
Heck				
Pollington				
Carlton (Hanger Lane)				
Goose House				
Austerfield BH				
Highfield Lane BH				
Finningley BH				
Littleworth BH				
Rossington Bridge BH				
Hatfield BH				
Hatfield Woodhouse BH				
Armthorpe BH				
Boston Park BH				
Thornham BH				
Nutwell BH				
Coffin Field BH				
Green Lane BH				
Whitemoor BH				
Clogger Lane				
Bleam Moor				
Elslack BH				
Redfirth Ghyll				
Imports and Exports				
Imports from Severn Trent Water - Ladybower Reservoir				40.00
SUB TOTAL (See Notes)				

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
Average	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
0.00	0.00				
3.49	6.82				
10.40	10.60				
1.40	1.40				
4.98	5.46				
0.97					
1.50	1.50				
1.56	1.79				
6.16	9.00				
10.00	10.00				
13.00	13.00				
7.40	7.50				
4.80	4.80				
10.20	10.20				
8.41	7.00				
9.59	11.00				
12.23	15.81				
13.65	16.64				
7.65	12.50				
4.26	4.54				
5.08	5.40				
5.50	8.70				
6.82	9.09				
5.81	9.09				
7.00	11.50				
8.27	8.80				
6.73	8.50				
0.31	0.60				
0.22	0.42				
0.65	0.70				
0.00					
0.48					
0.09					

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
GRID\SWZ(Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
RESOURCE ZONE TOTAL	1492.00	1352.00	1417.00				68.50	1423.50	1283.50	1348.50

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	1492.00		
	Scenario 2	1352.00		
	Scenario 3	1417.00		
	Change from Scenario 3 to Scenario 1		-75.00 Ml/d	-5 %
	Change from Scenario 3 to Scenario 2		65.00 Ml/d	5 %

NOTES

1.Assessment of deployable output based on conjunctive use modelling. Individual source deployable outputs have not been provided and have therefore not been reported.

2. In general, individual deployable outputs for sources have not been provided, and have therefore not been reported. Where deployable output figures were accessible, they have been entered in the tables.

YORKSHIRE WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
DALES/GWZ	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Reservoirs				
None				
Run of River Schemes				
None				
Groundwater Sources				
Thruscross BH				
Eagle Level Adit				
Lower Dunsforth/Bog Bridge BH				
Marton-Cum-Grafton BH				
Mickey BH				
Lofthouse Spring				
Burton Leonard BH				
Studforth BH				
Knaresborough				
Rippon Camp BH				
Middlesmoor				
Downholme				
Garland Hill				
Langthwaite				
Catterick Bridge				
Coatsgarth				
Crumma				
Feldom (low zone)				
Gandale				
Newsham				
Austwick/Wharfe/Lawkland				
Bentham/Burton in Lonsdale				
Badger Ford				
Ingleton				
Keasden				
Langcliffe (Cowside)				
Settle WTW				
Giggleswick BH				
Airton				
Airton Green				
Malham				
Buckden				
Burnshall				
Hodge Clough				
SUB TOTAL (See Notes)				

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
Average	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
0.00				
4.01	4.90			
5.00	5.00			
0.19	0.20			
0.02	0.02			
0.12	0.26			
1.23	2.00			
0.00				
0.00				
0.01	0.01			
0.01	0.02			
0.46	0.62			
0.52	0.79			
8.00	12.50			
0.66	1.38			
0.68	2.01			
0.00				
0.62	1.16			
1.18	1.24			
0.13	0.18			
0.60				
0.60	0.66			
0.54	0.87			
0.18	0.18			
0.08	0.18			
0.39	1.37			
0.17	0.33			
0.01	0.10			
0.02	0.25			
0.05	0.07			
0.00				
1.69	1.69			

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
DALES/GWZ (Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		Average	*Average Day Peak Week*
Groundwater Sources (Contd.)									
Coniston/Kilnsey					0.06	0.09			
Grassington/Hebden/Linton					0.00	0.63			
Hawkswick					0.00	0.03			
Kettlewell					0.02	0.02			
Kettlewell Borehole					0.08	0.09			
Oughtershaw					0.00	0.01			
Starbottom					0.01	0.04			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					25.00		0.00	25.00	

TOTAL DEPLOYABLE OUTPUT	Average	25.00 Ml/d
	Peak Week	
WATER AVAILABLE FOR USE (Ml/d)	Average	25.00 Ml/d
	Peak Week	

NOTES

1. In general, individual deployable outputs for sources have not been provided, and have therefore not been reported. Where deployable output figures were accessible, they have been entered in the tables.

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
EAST/SWZ	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
Esk Intake				6.80					
Groundwater Sources									
Westerdale					1.01				
Hazel Head					0.87				
Imports and Exports									
Import from Northumbrian Water				1.20					
RESOURCE ZONE TOTAL				8.00	1.88		0.00	9.88	

TOTAL DEPLOYABLE OUTPUT	Average	9.88 Ml/d
	Peak Week	
WATER AVAILABLE FOR USE (Ml/d)		
	Average	9.88 Ml/d
	Peak Week	

NOTES

1. In general, individual deployable outputs for sources have not been provided, and have therefore not been reported. Where deployable output figures were accessible, they have been entered in the tables.

YORKSHIRE WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
EAST/GWZ	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average*		*Average*	*Average*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Burton Agnes BH					2.74	2.73			
Haisthorpe BH					10.30	10.30			
Mill Lane BH					6.85				
East Ness BH					11.40	12.40			
Keld Head BH					7.00	7.00			
Norton (Howe Hill) BH					2.49	3.11			
Kilburn (Oldstead)					0.50	0.94			
East Moors					0.23				
Rudland & Farndale					0.31				
Amotherby					0.00	0.00			
Irton					22.51	23.50			
Cayton - Station Road BH					1.33	1.04			
Cayton - Carr BH					8.13	7.45			
Filey									
Imports and Exports									
None									
RESOURCE ZONE TOTAL					73.82		0.00	73.82	

TOTAL DEPLOYABLE OUTPUT Average 73.82 Ml/d
Peak Week

WATER AVAILABLE FOR USE (Ml/d)
Average 73.82 Ml/d
Peak Week

NOTES

1. In general, individual deployable outputs for sources have not been provided, and have therefore not been reported. Where deployable output figures were accessible, they have been entered in the tables.

WATER COMPANY SUMMARY

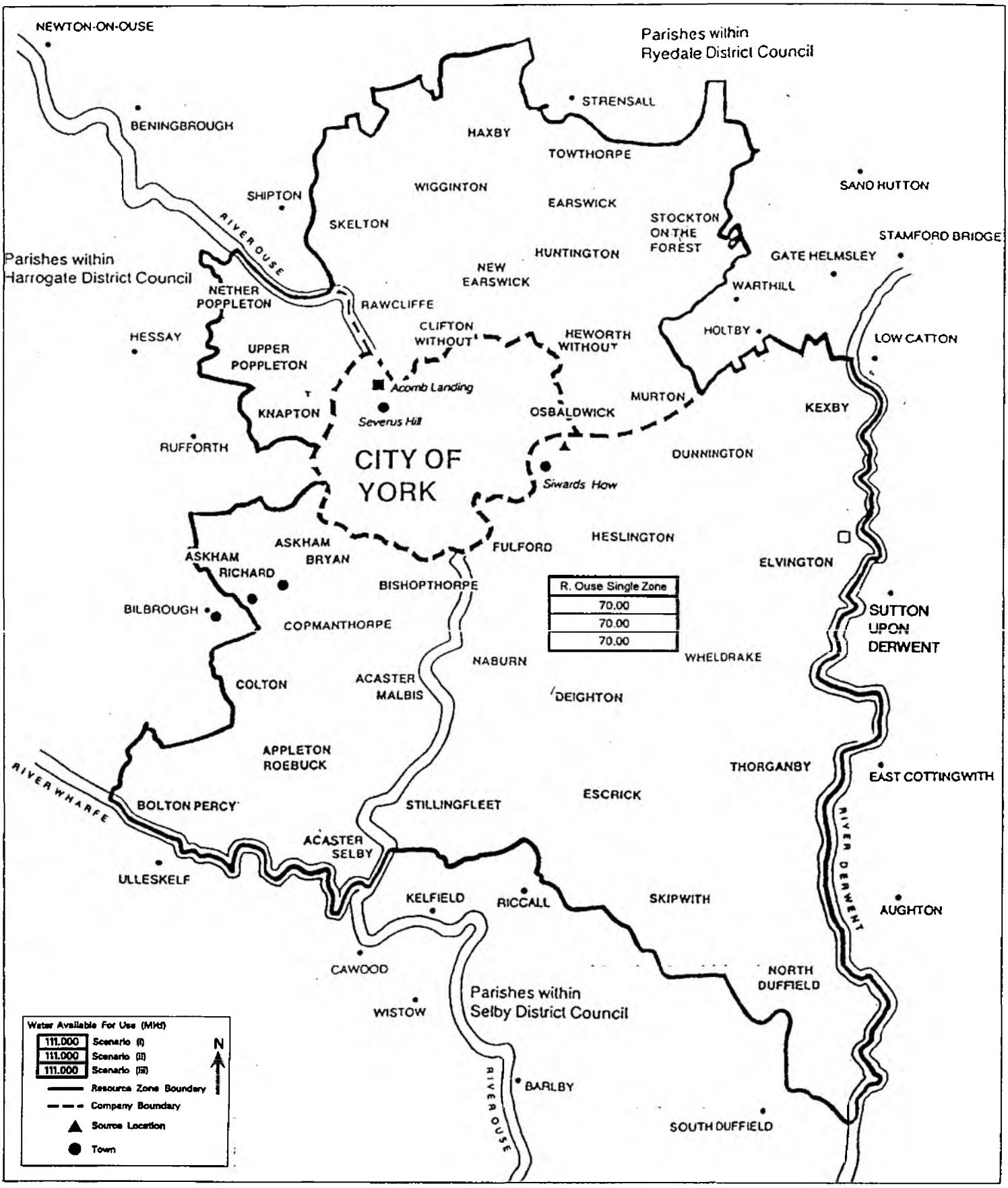
PREVIOUS YIELD ESTIMATES	1568.11 Ml/d	
COMPANY DEPLOYABLE OUTPUT	1460.70 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-107.41 Ml/d	-7 %
1997 WATER AVAILABLE FOR USE	1392.20 Ml/d	

York Waterworks

The company has one resource zone supplying water to all of its area. The water is obtained from the River Ouse towards the upstream edge of York. The company has a licence to abstract significantly more than the current demand or than the current intake and pumping capacity. There are no restrictions on the licence linked to the river flow so that as long as the flow is above the licensed quantity the company is guaranteed the water. The lowest historic flows are well above the licensed quantity so that the Deployable Output is limited by the capacity of the intake structure and related assets.

The Deployable Output is lower than the old quoted yield as previously the licensed quantity was used. The company has an arrangement with Yorkshire Water Services to obtain water from them in case of pollution in the river or other emergencies.

The company's Standard of Service is for no restrictions so that scenarios 1 and 2 give the same DO. Scenario 3 is not applicable as the resources do not limit the DO.



North East Region

YORK WATERWORKS SUPPLY AREA

YORK WATERWORKS COMPANY

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)
COMPANY-WIDE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		
Reservoirs								
None								
Run of River Schemes								
River Ouse				82.00				
Groundwater Sources								
None								
Imports and Exports								
None								
RESOURCE ZONE TOTAL				82.00			12.00	70.00

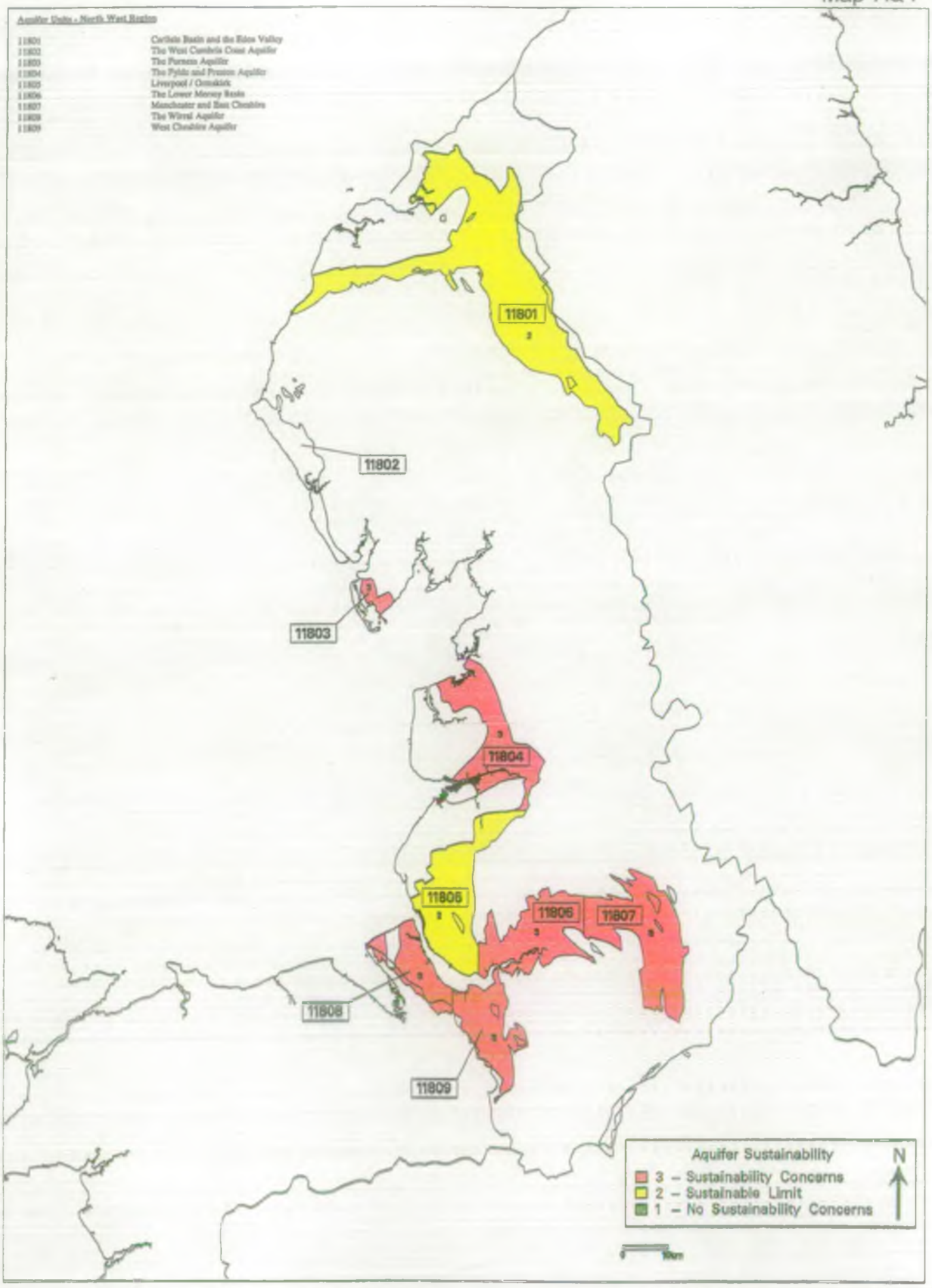
TOTAL DEPLOYABLE OUTPUT 82.00 Ml/d

WATER AVAILABLE FOR USE (Ml/d) 70.00 Ml/d

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	96.00 Ml/d	
TOTAL DEPLOYABLE OUTPUT	82.00 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-14.00 Ml/d	-15 %
1997 WATER AVAILABLE FOR USE	70.00 Ml/d	

NORTH WEST REGION



AQUIFER SUSTAINABILITY - North West Region

North West Water

NWW Ltd supplies water to the whole of NW England, from a wide variety of sources (168 impounding reservoirs, 45 river and stream intakes, 37 spring sources, mines and adits, and 143 boreholes in use). Over 90% of water supplied is managed within the Integrated resource zone, which excludes only sources in North and West Cumbria. Here the supply system is separated into 4 smaller resource zones, Carlisle, Keswick, Eden and West Cumbria.

Key features of the Integrated resource zone are major aqueducts which deliver water from the Lake District to South Cumbria, Lancashire and Greater Manchester, and from Lake Vyrnwy and the River Dee to Cheshire and Merseyside. These are also linked to give a high degree of transferability across the region.

The Carlisle resource zone is served by abstractions from the River Gelt via Castle Carrock Reservoir, the River Eden, and local mine adits.

West Cumbria is mainly supplied from Ennerdale Water and Crummock Water, which are raised natural lakes. These are supplemented by a number of small reservoir, spring and borehole sources.

Keswick is supplied mainly from stream sources, augmented by a pipeline connection to Thirlmere.

The Eden resource zone is supplied from a variety of small local sources.

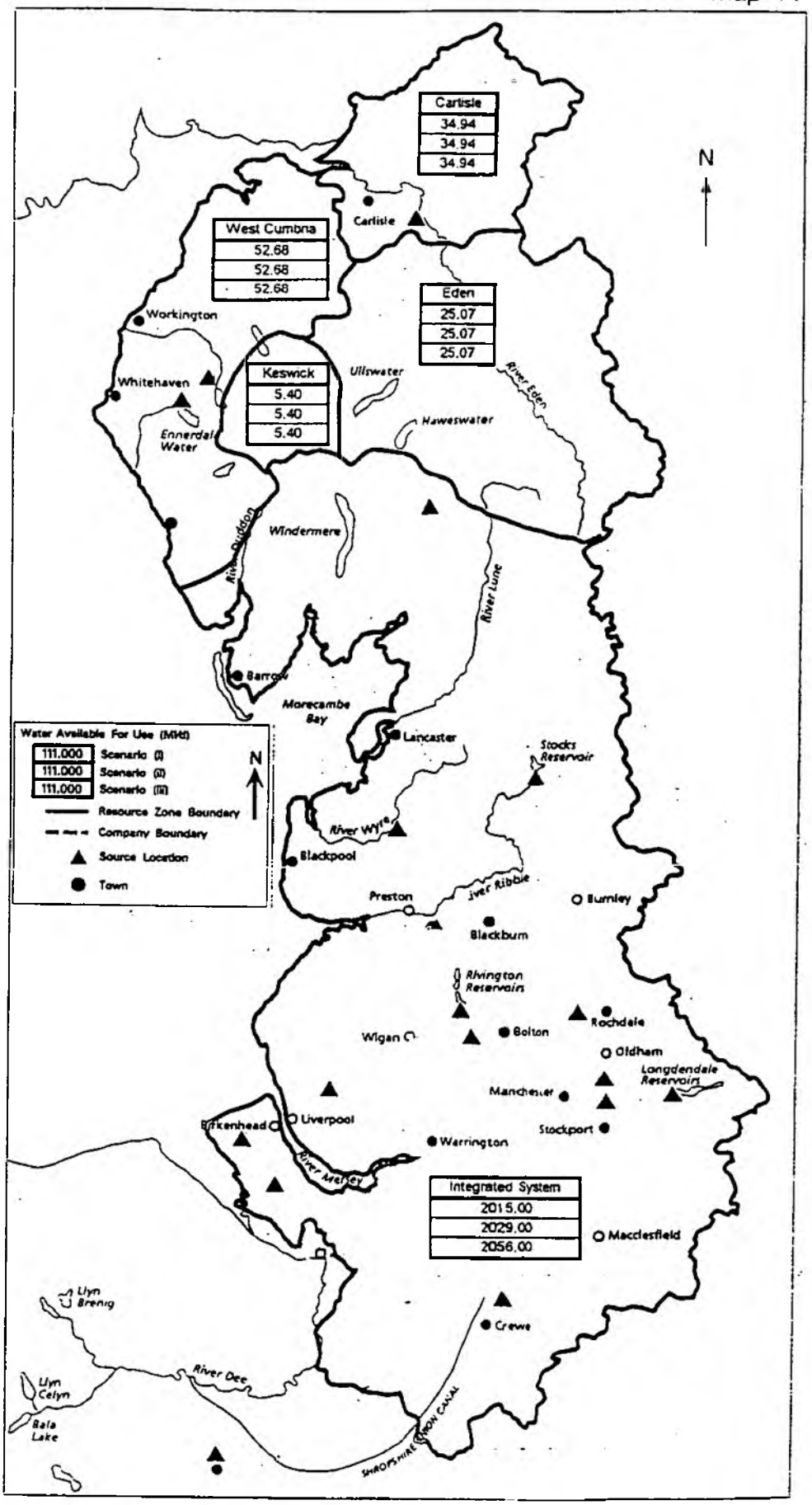
The combined yield of sources within the Integrated resource zone was assessed using a water resource simulation and optimisation model. This allows development of operating policies which make best use of the range of source types, and increase the resilience of the system. Similar methods on a smaller scale were used for the Cumbrian resource zones. Groundwater source yields were assessed and included in the models. These provide between ten and fifteen percent of water available for supply.

The revised values for water available for use in the region are 16% lower than previously reported. This is due to a number of reasons:

i. Inclusion of the 1995-6 drought in the flow record
ii. Adoption of the worst historic conditions as the basis for assessment, rather than a 1% or 2% probability of source emptying
iii. Additional emergency storage allowance as defined in the methodology, for drought worse than previously experienced
iv. Additional allowance for demand peaking in hot years.

The reduction of 41 Ml/d in West Cumbria is largely due to the emergency storage provision, which significantly reduces the active storage volume of the reservoir sources.

Map 11



North West Region

NORTH WEST WATER SUPPLY AREA

NORTH WEST WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
CARLISLE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Castle Carrock Reservoir	11.70	11.70	11.70							
Run of River Schemes										
River Eden				23.00						
Groundwater Sources										
Roughton Gill Adit					1.38	1.74				
Killhope					0.00	0.00				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	11.70	11.70	11.70	23.00	1.38	1.74	1.14	34.94	34.94	34.94

TOTAL DEPLOYABLE OUTPUT (Ml/d)		
	Scenario 1	36.08
	Scenario 2	36.08
	Scenario 3	36.08

Change from Scenario 3 to Scenario 1	0.00 Ml/d	0 %
Change from Scenario 3 to Scenario 2	0.00 Ml/d	0 %

NORTH WEST WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
EDEN	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Reservoirs				
Hayeswater Reservoir	1.10	1.10	1.10	
Blea Water Reservoir	3.80	3.80	3.80	
Run of River Schemes				
Harper Hils				8.00
Groundwater Sources				
Beacon Edge Borehole				
Fairhill Borehole				
Grisedale Brow Springs				
Kirkby Stephen Borehole				
Fewsteads Adit				
Hardedge Adit				
Hayring Adit				
Springfield Springs				
Bankwood Springs				
Bowscar Borehole				
Bull Fell Springs				
Cliburn Borehole				
Dale Springs				
Eden Hall Borehole				
Gamblesby Borehole				
Nord Vue Borehole				
Long Grain				
Shallow Wells				
Imports and Exports				
None				
RESOURCE ZONE TOTAL	4.90	4.90	4.90	8.00

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Scenario 1	26.40
	Scenario 2	26.40
	Scenario 3	26.40

Change from Scenario 3 to Scenario 1	0.00 Ml/d
Change from Scenario 3 to Scenario 2	0.00 Ml/d

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
Average	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
0.75	1.50				
3.06	3.30				
0.11	0.23				
0.22	1.31				
0.10	0.18				
0.04	0.06				
0.02	0.15				
0.33	0.52				
0.65	0.79				
1.69	3.36				
0.29	0.39				
1.50	1.80				
0.60	0.75				
2.24	2.27				
1.00	1.30				
0.90	0.90				
0.00	0.00				
0.00	0.00				
13.50	18.81	1.33	25.07	25.07	25.07

0 %
0 %

NORTH WEST WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
INTEGRATED SYSTEM	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
See Notes										
Run of River Schemes										
River Lune and River Wye										
Ulpha (Seathwaite Tarn and the River Duddon)										
River Dee										
Groundwater Sources										
Barrow Group					11.55	11.55				
Bowland Group					8.78	9.40				
Burnley Group					4.54	7.12				
Cumbria Isolated Sources					0.39	0.51				
Foxhill Group					35.44	46.16				
Fylde Broughton A Group					19.32	0.00				
Fylde Broughton B Group					7.61	12.40				
Fylde Franklaw A Group					36.68	49.11				
Fylde Franklaw B Group					7.75	32.84				
Liverpool Group					0.00	0.00				
Rochdale&Bolton Group					7.78	7.78				
South Cheshire Sources Group					18.49	30.80				
St Helens Group					25.63	29.20				
Waddington Fell Group					3.07	4.28				
Warrington Group					39.14	43.53				
West Lancs Group					33.45	44.59				
Widnes Group					42.78	42.44				
Wigan Group					30.63	30.65				
Wilmslow Group					21.09	21.10				
Wirrel Group					21.78	23.95				
Delamere Group					25.48	35.93				
Imports and Exports										
None										
RESOURCE ZONE TOTAL (See Notes)	2065.00	2079.00	2106.00				50.00	2015.00	2029.00	2056.00

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Scenario 1	2065.00		
	Scenario 2	2079.00		
	Scenario 3	2106.00		
	Change from Scenario 3 to Scenario 1		0.02 Ml/d	2 %
	Change from Scenario 3 to Scenario 2		0.01 Ml/d	1 %

NOTES

1. The Integrated System conjunctive use system provides water to a major part of North West Water's supply area. Modelling of the system was carried out conjunctively. The system includes individual source groups.
2. Individual source deployable outputs have therefore not been provided and have not been reported. Total deployable output figures based on conjunctive use modelling.

NORTH WEST WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
KESWICK	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Thirlmere-Thirlspot				1.00						
Thirlmere-Bridge End				1.00						
Run of River Schemes										
Mill Beck Gill				0.78						
Roughton Gill				2.02						
The High				0.23						
Sail Beck				0.14						
Coombe Gill				0.07						
Greenup Syke				0.33						
Groundwater Sources										
None										
Imports and Exports										
None										
RESOURCE ZONE TOTAL				5.57			0.17	5.40	5.40	5.40

TOTAL DEPLOYABLE OUTPUT (Ml/d)		
	Scenario 1	5.57
	Scenario 2	5.57
	Scenario 3	5.57

Change from Scenario 3 to Scenario 1	0.00 Ml/d	0 %
Change from Scenario 3 to Scenario 2	0.00 Ml/d	0 %

NOTES

1. Deployable output under the three scenarios for surface water systems were not calculated due to the flashiness, and short critical periods of the storage sources. For all practical purposes, all three scenarios are assumed to be equivalent.

NORTH WEST WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
WEST CUMBRIA	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Chapel House Reservoir	5.76	5.76	5.76							
Crummock Water	14.00	14.00	14.00							
Hause Gill	0.87	0.87	0.87							
Ennerdale Water	31.90	31.90	31.90							
Run of River Schemes										
Worm Gill				0.00						
Groundwater Sources										
Aughertree Springs					0.72	0.94				
Scales Boreholes					1.00	0.00				
Longlands Adit					0.14	0.19				
Sandale					0.00	0.00				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	52.53	52.53	52.53		1.86	1.13	1.71	52.68	52.68	52.68

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Scenario 1	54.39		
	Scenario 2	54.39		
	Scenario 3	54.39		
	Change from Scenario 3 to Scenario 1		0.00 Ml/d	0 %
	Change from Scenario 3 to Scenario 2		0.00 Ml/d	0 %

WATER COMPANY SUMMARY

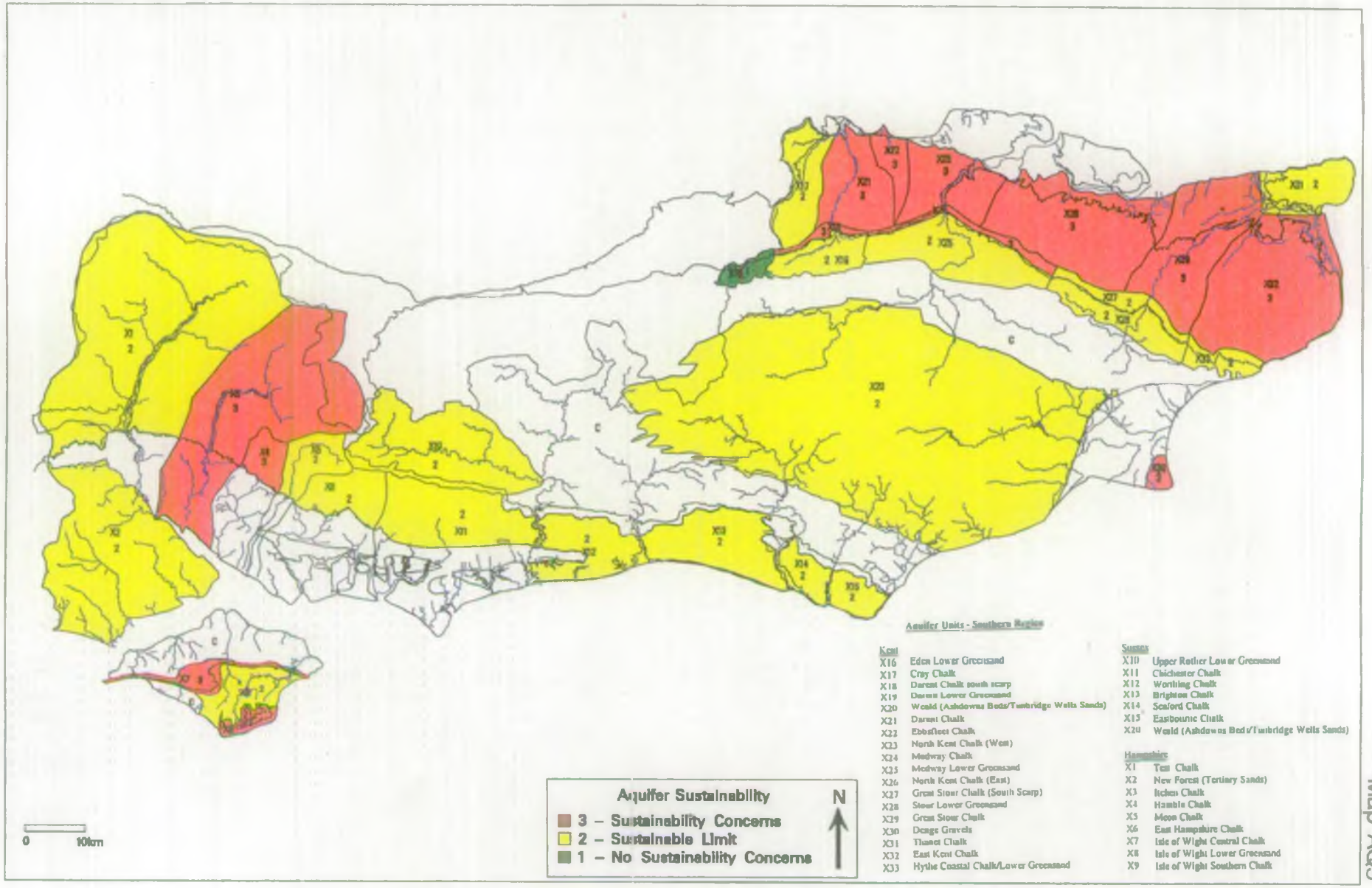
PREVIOUS YIELD ESTIMATES	2606.30 Ml/d	
TOTAL DEPLOYABLE OUTPUT	2201.44 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-404.86 Ml/d	-16 %
1997 WATER AVAILABLE FOR USE	2147.09 Ml/d	

NOTES

1. Deployable output under the three scenarios for surface water systems were not calculated due to the flashiness, and short critical periods of the storage sources.

SOUTHERN REGION

AQUIFER SUSTAINABILITY - Southern Region



Map AQ5

Folkestone and Dover Water

Folkestone and Dover serve the coastal strip from Kingsdown (South of Deal) to Dungeness, including the towns of Folkestone, Dover and Hythe and the area to some 15 km inland behind them. The Company is totally dependent on local groundwater sources. The Reaasessment suggests deployable output to have decreased on average, but increased in respect to peaks. However the increase results largely from a development implemented since the previous yields were agreed.

Map 12

Southern Region

FOLKESTONE AND DOVER SUPPLY AREA

FOLKESTONE AND DOVER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
COMPANY-WIDE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Ottinge, Skeete, World's Wonder					2.55	4.87			
Lye Oak, Drellingore					12.85	14.20			
Shearway, Cherry Garden Springs, Ter Tunnel					0.76	3.06			
Primrose					1.56	2.18			
Connaught					4.10	7.00			
Broome					2.28	2.69			
St Magarets					1.13	3.70			
Denton, Tappington North, Rakeshole North					9.08	10.30			
Poulton					0.08	0.11			
Stonehall					0.00	0.00			
Holmestone					2.27	2.50			
Lighthouse					2.05	2.06			
Kingsdown					3.00	3.00			
Dover Priory					2.88	2.88			
Denge					5.00	6.00			
Hythe, Saltwood, Blackrock, Seabrook Spr					0.32	0.32			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					49.91	64.87	6.00	43.91	58.87

TOTAL DEPLOYABLE OUTPUT	Average	49.91 Ml/d
	Peak Week	64.87 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	43.91 Ml/d
	Peak Week	58.87 Ml/d

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	49.27 Ml/d	
TOTAL DEPLOYABLE OUTPUT	49.91 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	0.64 Ml/d	1 %
1997 WATER AVAILABLE FOR USE	43.91 Ml/d	

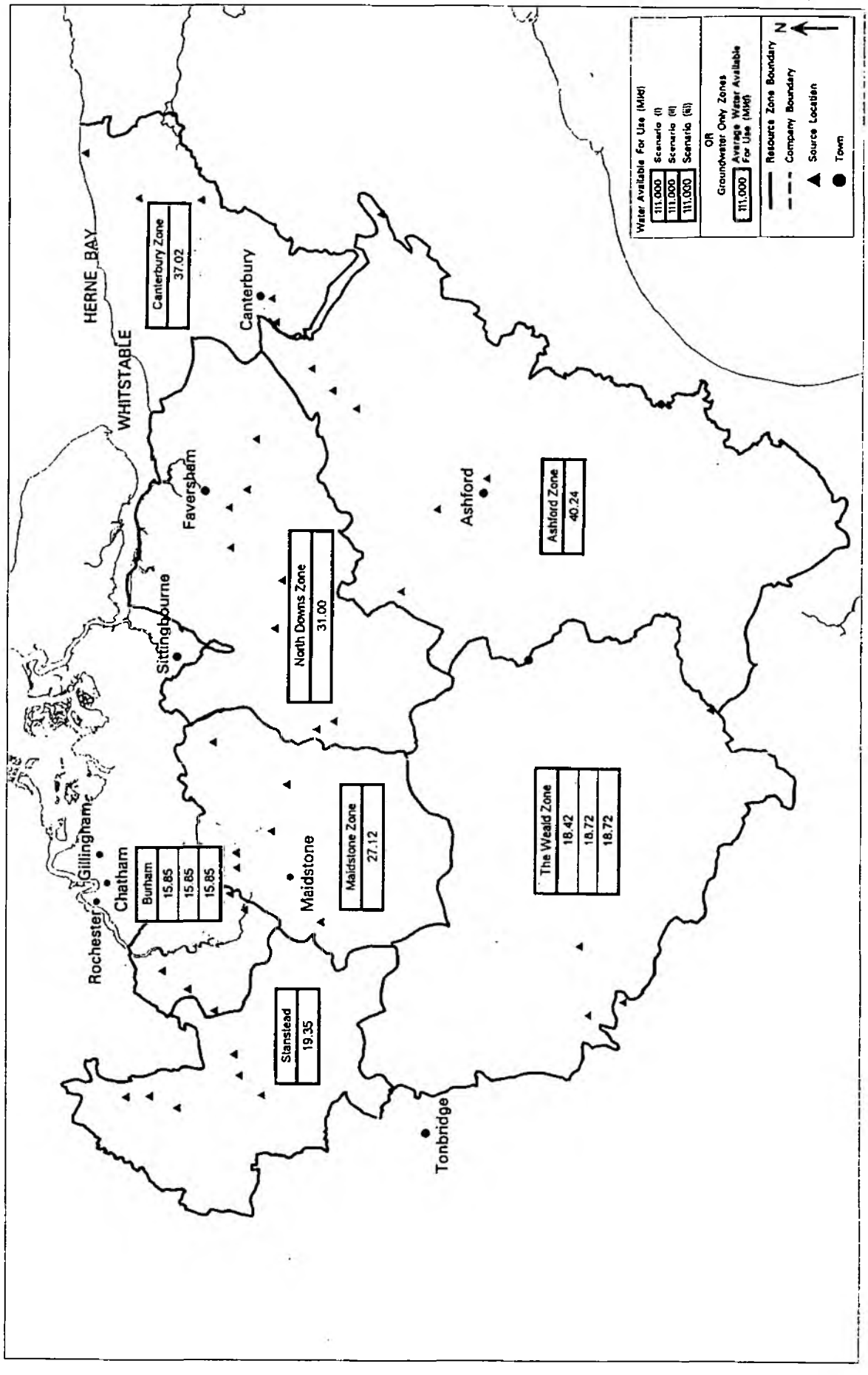
NOTES

1. Deployable outputs made up entirely from groundwater sources

Mid-Kent Water

Mid-Kent Water operates through seven Resource zones and supplies the major centres of population in Maidstone,Canterbury and Ashford, while also serving the extensive and largely rural surrounding area. The Reassessment suggests a decrease in the resources available from the Bewl Reservoir-River Medway scheme. Despite this all Resource zones have an increased deployable output on both peak and average, with an overall Company increase of around 10% on the previous assessment. Much of this increase results from groundwater source infrastructure improvements put in place by the Company since the previous yields were agreed. The Company has also achieved source work enhancements by optimisation and remediation.

Map 14



Southern Region

MID KENT WATER SUPPLY AREA

MID KENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
ASHFORD	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Chilham/Chartham					13.60	13.60			
Godmerham					13.60	13.60			
Charing					4.55	5.00			
Westwell					3.27	3.27			
Henwood					0.00	0.00			
Kingston					6.20	6.20			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					41.22	41.67	0.98	40.24	40.69

TOTAL DEPLOYABLE OUTPUT	Average	41.22 Ml/d
	Peak Week	41.67 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	40.24 Ml/d
	Peak Week	40.69 Ml/d

MID KENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
BURHAM	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Burham (Medway)	12.00	12.00	12.00							
Run of River Schemes										
None										
Groundwater Sources										
Halling Greensand					0.70	1.50				
Halling Chalk					2.00	2.00				
Cossington Greensand					1.00	1.00				
Cossington Chalk					1.50	1.44				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	12.00	12.00	12.00		5.20	5.94	1.35	15.85	15.85	15.85

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	17.20		
	Scenario 2	17.20		
	Scenario 3	17.20		
	Change from Scenario 3 to Scenario 1		0.00 Ml/d	0 %
	Change from Scenario 3 to Scenario 2		0.00 Ml/d	0 %

MID KENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
CANTERBURY	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Thanington					18.20	22.70 (20.50)			
Howfield					13.60	17.00 (13.60)			
Hoplands Farm					4.55	6.80			
Reculver					0.00	0.00			
Ford					2.00	2.00			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					38.35	48.50 (42.90)	1.33	37.02	47.17

TOTAL DEPLOYABLE OUTPUT	Average	38.35 Ml/d
	Peak Week	48.50 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	37.02 Ml/d
	Peak Week	47.17 Ml/d

NOTES

1. In December 1998, the peak deployable output will reduce due to the expiration of a time limited licence.

MID KENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
NORTH DOWNS	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Wichling					7.50	7.50			
Wineycock Shaw					3.40	3.50			
Newnham					6.40	7.30			
Ospringe					7.10	7.10			
Copton					0.00	0.00			
Boughton					4.30	4.60			
Stockbury					3.40	5.00			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					32.10	35.00	1.10	31.00	33.90

TOTAL DEPLOYABLE OUTPUT	Average	32.10 Ml/d
	Peak Week	35.00 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	31.00 Ml/d
	Peak Week	33.90 Ml/d

MID KENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
MAIDSTONE	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Reservoirs				
None				
Run of River Schemes				
None				
Groundwater Sources				
* Thurnham				
Hockers Lane				
Boxley Greensand				
Boxley Chalk				
Forstal				
Harnetsham				
Boarley Springs				
Farleigh Springs				
SWS Belmont Transfer				
Imports and Exports				
None				
RESOURCE ZONE TOTAL				

TOTAL DEPLOYABLE OUTPUT	Average	27.50 Ml/d
	Peak Week	31.28 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	27.12 Ml/d
	Peak Week	30.90 Ml/d

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
Average	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
8.40	10.00			
2.50	3.00			
1.00	1.00			
2.30	2.50			
7.00	7.00			
0.00	0.00			
0.00	0.00			
0.00	0.00			
6.30	7.78			
27.50	31.28	0.38	27.12	30.90

MID KENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
STANSTED	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Borough Green					1.30	1.30			
Nepicar Lane					1.50	2.75			
Trosley					6.20	10.00			
Ryarsh					2.00	2.00			
Paddlesworth					1.00	3.00			
Hartley Chalk					4.30	4.50			
Ridley					1.20	2.90			
Stansted					0.00	0.00			
Hartley Greensand					2.20	2.20			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					19.70	28.65	0.35	19.35	28.30

TOTAL DEPLOYABLE OUTPUT	Average	19.70 Ml/d
	Peak Week	28.65 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	19.35 Ml/d
	Peak Week	28.30 Ml/d

MID KENT WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
THE WEALD	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Bewl Reservoir	8.70	9.00	9.00							
Run of River Schemes										
Goudhurst River										
Groundwater Sources										
Goudhurst					6.50	5.00				
Lamberhurst					0.50	2.00				
Maytham Farm					0.50	1.90				
Bewl Bridge Boreholes					3.00	4.00				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	8.70	9.00	9.00		10.50	12.90	0.78	18.42	18.72	18.72

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	19.20		
	Scenario 2	19.50		
	Scenario 3	19.50		
	Change from Scenario 3 to Scenario 1		0.30 Ml/d	2 %
	Change from Scenario 3 to Scenario 2		0.00 Ml/d	0 %

NOTES

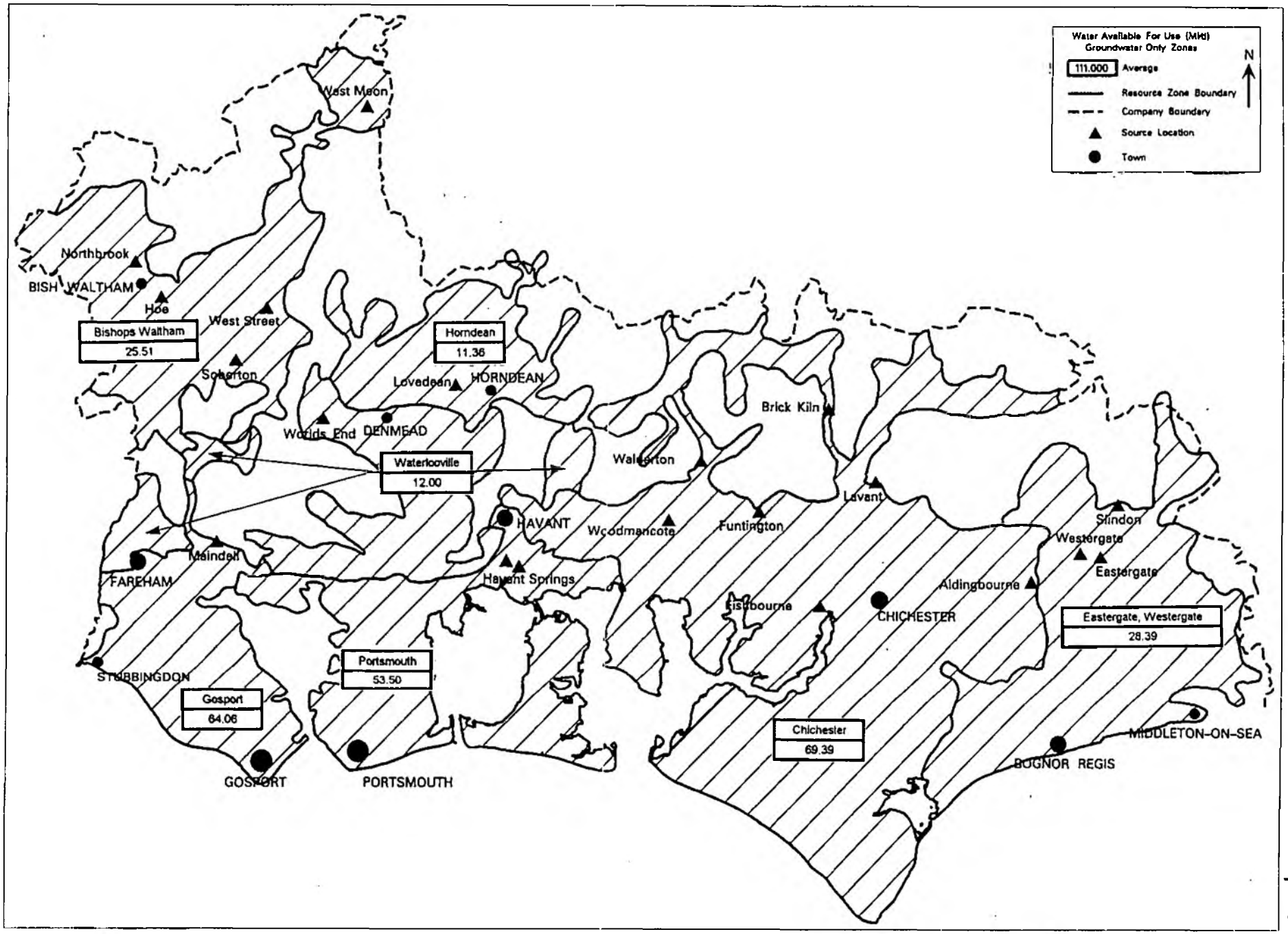
1. Average outage figures used to compute water available for use

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	192.18 Ml/d	
TOTAL DEPLOYABLE OUTPUT	195.57 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	3.39 Ml/d	2 %
1997 WATER AVAILABLE FOR USE	189.30 Ml/d	

Portsmouth Water

The main towns supplied by Portsmouth Water include Gosport, Portsmouth, Havant and Chichester and the Company operates seven resource zones. The total resource base is heavily dependent on wells and boreholes which provide approximately 50% of resources. The largest individual sources are the River Itchen abstraction and the Havant and Bedhampton springs, at 15% and 21 % of peak deployable output respectively. Deployable outputs have held up well in the reassessment, but the Company has largely relied on previous yield estimates in its submission.



Southern Region

PORTSMOUTH WATER SUPPLY AREA

Map 16

PORTSMOUTH WATER COMPANY

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
BISHOP WALTHAM (ZONE 1)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Northbrook					20.51	28.00			
Hoe					5.00	7.50			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					25.51	35.50	0.21	25.30	35.29

TOTAL DEPLOYABLE OUTPUT

Average	25.51 Ml/d
Peak Week	35.50 Ml/d

WATER AVAILABLE FOR USE (Ml/d)

Average	25.30 Ml/d
Peak Week	35.29 Ml/d

NOTES

PORTSMOUTH WATER COMPANY

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
BOGNOR REGIS (ZONE 7)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Eastergate, Westergate, Slindon & Aldingb.					28.39	31.00			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					28.39	31.00	0.33	28.06	31.00

TOTAL DEPLOYABLE OUTPUT	Average	28.39 Ml/d
	Peak Week	31.00 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	28.06 Ml/d
	Peak Week	31.00 Ml/d

NOTES

PORTSMOUTH WATER COMPANY

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
CHICHESTER (ZONE 6)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Woodmancote					3.00	3.70			
Walderton					26.14	35.25			
Funtington					5.00	5.30			
Fishbourne					10.25	13.50			
Lavant/Brick kiln					25.00	29.10			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					69.39	86.85	2.58	66.81	84.27

TOTAL DEPLOYABLE OUTPUT	Average	69.39 Ml/d
	Peak Week	86.85 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	66.81 Ml/d
	Peak Week	84.27 Ml/d

NOTES

PORTSMOUTH WATER COMPANY

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
GOSPORT (ZONE 2)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
River Itchen				43.50					
Groundwater Sources									
West Meon					0.46	0.46			
Soberton					8.00	9.50			
West Street					9.10	9.10			
Maindell					3.00	6.50			
Imports and Exports									
None									
RESOURCE ZONE TOTAL				43.50	20.56	25.56	2.82	61.24	66.24

TOTAL DEPLOYABLE OUTPUT	Average	64.06 Ml/d
	Peak Week	69.06 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	61.24 Ml/d
	Peak Week	66.24 Ml/d

NOTES

PORTSMOUTH WATER COMPANY

RESOURCE ZONE/SOURCE DESCRIPTION		SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
HORNDEAN (ZONE 4)		*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs										
	None									
Run of River Schemes										
	None									
Groundwater Sources										
	Lovedean					11.36	12.10			
Imports and Exports										
	None									
RESOURCE ZONE TOTAL						11.36	12.10	0.51	10.85	11.59

TOTAL DEPLOYABLE OUTPUT	Average	11.36 Ml/d
	Peak Week	12.10 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	10.85 Ml/d
	Peak Week	11.59 Ml/d

NOTES

PORTSMOUTH WATER COMPANY

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
PORTSMOUTH (ZONE 5)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Havant & Bedhampton					53.50	63.00			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					53.50	63.00	0.29	53.21	62.71

TOTAL DEPLOYABLE OUTPUT	Average	53.50 Ml/d
	Peak Week	63.00 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	53.21 Ml/d
	Peak Week	62.71 Ml/d

NOTES

PORTSMOUTH WATER COMPANY

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
WATERLOOVILLE (ZONE 3)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Worlds End					12.00	16.00			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					12.00	16.00	0.16	11.84	15.84

TOTAL DEPLOYABLE OUTPUT	Average	12.00 Ml/d
	Peak Week	16.00 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	11.84 Ml/d
	Peak Week	15.84 Ml/d

NOTES

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	262.50 Ml/d	
TOTAL DEPLOYABLE OUTPUT	264.21 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	1.71 Ml/d	1 %
1997 WATER AVAILABLE FOR USE	257.30 Ml/d	

South East Water

South East Water serve most of East Sussex, parts of North-west Kent and an important part (Mid-Sussex District Council) of West sussex through three resources zones, each bordering with at least one of the others. The Reassessment suggests some improvement in average deployable output, but a notable decline in peak deployable output. South East Water's key surface water deployable outputs have held up compared to previous estimates due to a greater consideration to used-water returning in the catchments. South East Water's groundwater sources appear to have suffered more widespread down-rating than those of other Companies and this has contributed significantly to the reduced peak deployable output.

SOUTH EAST WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
MID SUSSEX	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Ardingly/Shellbrook and Barcombe	44.50	54.50	54.50							
Run of River Schemes										
Holywell/Cockhaise				1.40						
Groundwater Sources										
Balcombe					0.00	0.00				
Coggins Mill & Sharnden					1.30	1.30				
Ditchling					0.00	0.00				
Forest Row					2.50	3.30				
Groombridge & Eridge					4.80	5.00				
Hackenden					0.90	0.90				
Hempstead					1.60	1.60				
Maynards Gate					0.00	0.00				
Seaford Chalk					15.40	20.80				
Underhill					2.40	4.00				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	44.50	54.50	54.50	1.40	28.90	36.90	4.80	70.00	80.00	80.00

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Scenario 1	74.80		
	Scenario 2	84.80		
	Scenario 3	84.80		
	Change from Scenario 3 to Scenario 1		10.00 Ml/d	13 %
	Change from Scenario 3 to Scenario 2		0.00 Ml/d	0 %

SOUTH EAST WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
MEDWAY	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Cramptons					17.70	20.00			
Kemsing					1.50	1.50			
Oaklane					0.80	0.70			
Pembury and Hartlake					9.10	9.80			
Saints Hill					5.50	6.50			
Tanpier					0.40	0.40			
Tonbridge					3.60	3.60			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					38.60	42.50	1.90	36.70	40.60

TOTAL DEPLOYABLE OUTPUT	Average	38.60 Ml/d
	Peak Week	42.50 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	36.70 Ml/d
	Peak Week	40.60 Ml/d

SOUTH EAST WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
EASTBOURNE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Arlington	18.50	19.00	19.00							
Run of River Schemes										
Crowhurst Bridge				2.00						
Hazards Green				7.90						
Sedlescombe				0.90						
Groundwater Sources										
Cowbeech					0.00	0.00				
Eastbourne Chalk					24.70	27.60				
Powder Mill					3.00	3.60				
Sweet Willow Wood					2.20	2.30				
Crowhurst Bridge					7.30	8.00				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	18.50	19.00	19.00	10.80	37.20	41.50	3.30	63.20	63.70	63.70

TOTAL DEPLOYABLE OUTPUT (Ml/d)		
	Scenario 1	66.50
	Scenario 2	67.00
	Scenario 3	67.00

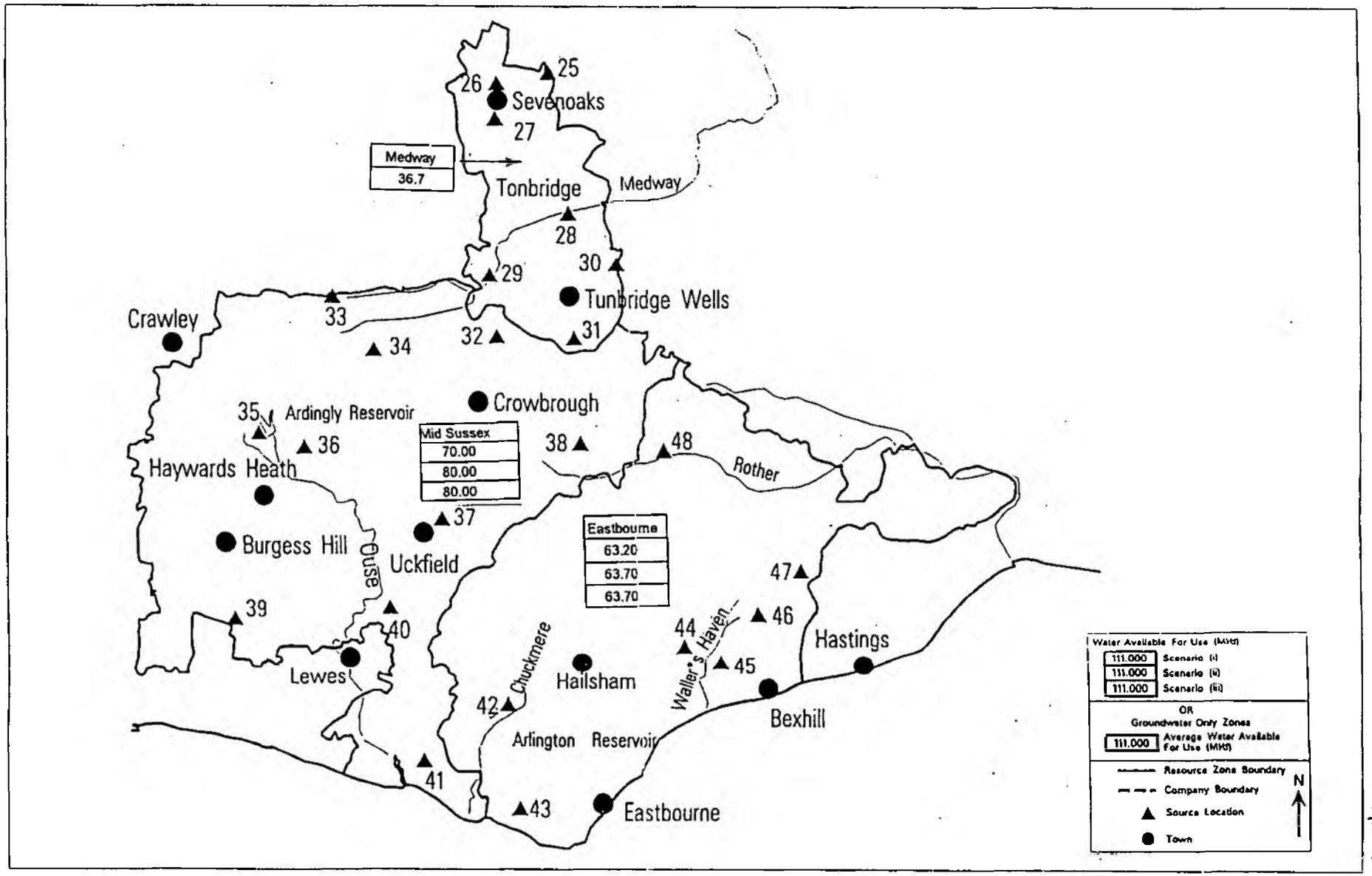
Change from Scenario 3 to Scenario 1	0.50 Ml/d	1 %
Change from Scenario 3 to Scenario 2	0.00 Ml/d	0 %

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	177.02 Ml/d	
TOTAL DEPLOYABLE OUTPUT	190.40 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	13.38 Ml/d	8 %
1997 WATER AVAILABLE FOR USE	160.40 Ml/d	

Southern Region

SOUTH EAST WATER SUPPLY AREA



Map 15

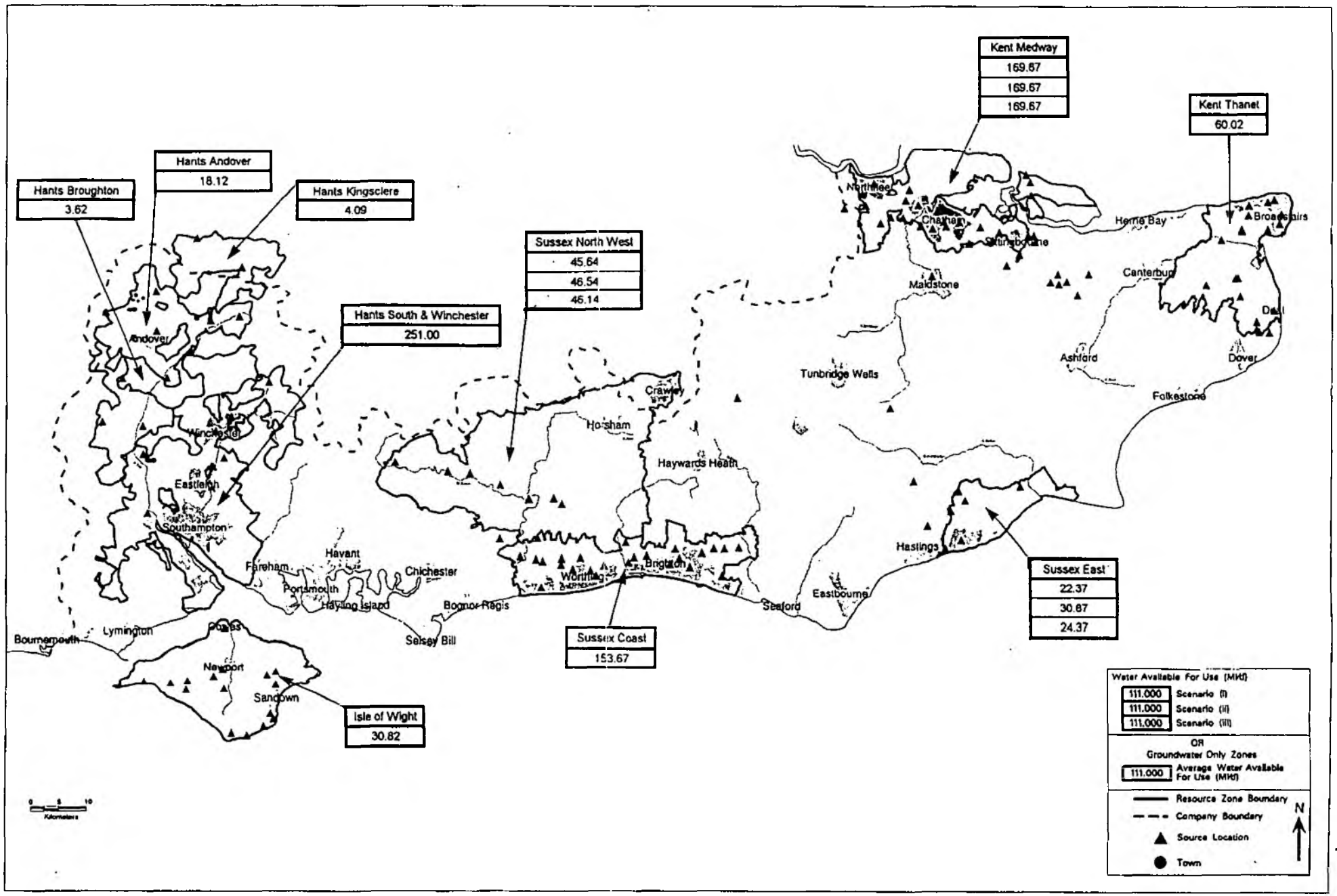
Southern Water Services (SWS)

SWS operate ten resource zones. Four cover most of Hampshire and the Isle of Wight is linked to Hampshire South by the cross Solent main. In Sussex SWS serve Sussex North (and West) which borders Sussex Coast (Brighton, Worthing and coastal conurbation). Sussex East (Hastings) is isolated, as are Kent Medway (North and East Kent) and Kent Thanet (Eastern promontory of Kent). Hence the Company is distributed in dissaggregated fashion across the three Counties of the Region. Overall the reassessment shows the Company water resources to be some 10% less than previously thought, but zone by zone the picture ranges from a 25 % decrease in Sussex North to a 5% increase in Kent Thanet for average minimum deployable outputs and from a 10% decrease in Kent Medway to a 20 % increase in Sussex East for peak deployable outputs.

Five of the six resource zones with reduced deployable output in the reassessment result from surface water sources being down-rated. Only the Sussex Coast's zone's decline is groundwater based. Some of the deployable output losses may be a little worse than first apparent because improvements and infrastructure developments have been implemented by the Company since yields were previously agreed.

Southern Region

SOUTHERN WATER SERVICES SUPPLY AREA



Map 13

SOUTHERN WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
HAMPSHIRE ANDOVER	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Andover					16.00	19.88			
Chilbolton					0.49	0.49			
Faberstown					0.15	0.45			
Ibthorpe					2.94	4.26			
Overton					1.64	1.64			
Whitchurch					1.64	1.64			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					22.85	28.35	4.73	18.12	23.62

TOTAL DEPLOYABLE OUTPUT	Average	22.85 Ml/d
	Peak Week	28.35 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	18.12 Ml/d
	Peak Week	23.62 Ml/d

SOUTHERN WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION		SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
SUSSEX EAST		*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs											
	Darwell	19.00	25.10	19.40							
	Powdermill	2.10	4.50	3.70							
Run of River Schemes											
	None										
Groundwater Sources											
	Brede					2.27	3.80				
	Buckshole					0.52	0.62				
	Cadborough					0.00	0.00				
	Fitsham					0.62	2.00				
	Forewood					0.00	0.00				
	Kent Street					0.00	0.00				
Imports and Exports											
	None										
RESOURCE ZONE TOTAL		21.10	29.60	23.10		3.41	6.42	2.14	22.37	30.87	24.37

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Scenario 1	24.51		
	Scenario 2	33.01		
	Scenario 3	26.51		
	Change from Scenario 3 to Scenario 1		2.00 Ml/d	8 %
	Change from Scenario 3 to Scenario 2		-6.50 Ml/d	-20 %

SOUTHERN WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
SUSSEX NORTH WEST	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Weirwood	8.80	9.70	9.30							
Run of River Schemes										
Hardham Conjunctive Use				15.70						
Groundwater Sources										
Haslingbourne					1.10	1.30				
Lodsworth					2.14	2.43				
Rogate					2.27	2.27				
Rotherfield					2.19	2.88				
Smoke Alloy					3.41	3.50				
Steyning					1.44	1.46				
Hardham Ground					13.59	24.67				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	8.80	9.70	9.30	15.70	26.14	38.51	5.00	45.64	46.54	46.14

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	50.64		
	Scenario 2	51.54		
	Scenario 3	51.14		
	Change from Scenario 3 to Scenario 1		0.50 Ml/d	1 %
	Change from Scenario 3 to Scenario 2		-0.40 Ml/d	-1 %

SOUTHERN WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
SUSSEX COAST	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Reservoirs				
None				
Run of River Schemes				
None				
Groundwater Sources				
Aquadom				
Angmering				
Arundel				
Broadwater				
Burpham				
Clapham				
Findon				
Madehurst				
Northbrook				
Patching				
Sompting				
Stanhope Lodge				
Warningcamp				
Aldrington				
Balsdean				
Falmer				
Goldstone				
Housedean				
Lewes Road				
Mile Oak				
Mossy Bottom				
Newmarket				
Patcham				
Shoreham				
Southover				
Surrenden				
Imports and Exports				
None				
RESOURCE ZONE TOTAL				

TOTAL DEPLOYABLE OUTPUT	Average	158.67 Ml/d
	Peak Week	204.79 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	153.67 Ml/d
	Peak Week	199.79 Ml/d

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
Average	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
0.00	0.00			
3.55	4.00			
3.13	4.32			
18.00	18.00			
5.30	7.70			
3.00	3.28			
4.32	8.00			
6.15	9.00			
2.32	5.60			
2.00	3.10			
11.31	11.50			
5.55	7.00			
5.00	5.00			
0.00	0.00			
7.80	12.00			
5.53	7.50			
12.62	19.01			
2.45	6.22			
3.36	7.00			
8.66	11.02			
3.30	3.50			
14.75	14.75			
6.85	9.05			
5.80	5.86			
14.42	17.75			
3.50	4.63			
158.67	204.79	5.00	153.67	199.79

SOUTHERN WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
KENT MEDWAY	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Reservoirs				
Medway Scheme	48.75	48.75	48.75	
Run of River Schemes				
None				
Groundwater Sources				
Fawkham				
Northfleet Chalk				
Northfleet Greensand				
Hazells				
Higham				
Three Crutches				
Strood				
Luddesdown Chalk				
Luddesdown Greensand				
Windmill Hill				
Cuxton				
Lower Bush				
Nashenden				
Snodhurst				
Luton				
Capstone Chalk				
Capstone Greensand				
Rainham Mark				
Keycole				
Highsted				
Matts Hill				
Gore				
Trundle Wood				
Trinity Road				
Sheerness East				
Wallend				
Danaway				
London Road				
Lomas Road				
Tonge				
Belmont				
Throwley				
Selling				
SUB TOTAL (See Previous Page)	48.75	48.75	48.75	

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
Average	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
6.83	7.88				
7.50	7.50				
0.00	0.00				
6.28	7.40				
0.82	0.84				
0.70	0.80				
2.75	4.00				
3.00	3.00				
1.40	1.60				
3.00	3.10				
6.70	6.70				
5.30	5.30				
5.20	5.20				
4.82	5.40				
5.10	5.10				
3.50	3.80				
1.40	1.40				
0.70	0.75				
1.27	1.73				
9.18	10.20				
15.82	19.15				
3.10	3.10				
0.00	3.90				
0.00	0.00				
0.00	0.00				
0.00	0.00				
3.40	5.00				
0.00	0.00				
0.00	0.00				
0.00	0.00				
10.95	11.30				
7.00	7.50				
10.20	15.40				
125.92	147.05				

SOUTHERN WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DE OUTPUT (Ml/d)	GROUNDWATER OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
KENT MEDWAY (Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak*	*Scenario 1*	*Scenario 2*	*Scenario 3*
SUB TOTAL (See Previous Page)	48.75	48.75	48.75		125.92	147.05			
Groundwater Sources Continued									
Kettle Hill					0.00	4.16			
Hockley Hole					0.00	4.52			
Beacon Hill					0.00	0.00			
Imports and Exports									
None									
RESOURCE ZONE TOTAL	48.75	48.75	48.75		125.92	155.73	5.00	169.67	169.67	169.67

TOTAL DEPLOYABLE OUTPUT (Ml/d)

Scenario 1	174.67
Scenario 2	174.67
Scenario 3	174.67

Change from Scenario 3 to Scenario 1	0.00 Ml/d	0 %
Change from Scenario 3 to Scenario 2	0.00 Ml/d	0 %

SOUTHERN WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
ISLE OF WIGHT	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Reservoirs				
None				
Run of River Schemes				
Sandown				7.20
Groundwater Sources				
Carisbrooke				
Bowcombe				
Knighton Greensand				
Knighton Chalk				
Ventnor				
Calbourne				
Chillerton				
Shalcombe				
Niton				
St Lawrence				
Brighstone Buddlehole				
Luccombe				
Broadfields				
Ashey				
Freshwater				
Shanklin Greatwoods				
Imports and Exports				
None				
RESOURCE ZONE TOTAL				7.20

TOTAL DEPLOYABLE OUTPUT	Average	33.57 Ml/d
	Peak Week	43.31 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	30.82 Ml/d
	Peak Week	40.56 Ml/d

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
Average	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
12.62	12.93			
0.00	5.40			
4.47	5.30			
3.84	4.51			
1.31	2.33			
2.32	2.34			
0.90	1.80			
0.44	0.79			
0.16	0.25			
0.31	0.46			
0.00	0.00			
0.00	0.00			
0.00	0.00			
0.00	0.00			
0.00	0.00			
0.00	0.00			
26.37	36.11	2.75	30.82	40.56

SOUTHERN WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
HAMPSHIRE KINGSCLERE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Kingsclere					5.68	5.68			
East Woodhay					3.00	3.50			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					8.68	9.18	4.59	4.09	4.59

TOTAL DEPLOYABLE OUTPUT	Average	8.68 Ml/d
	Peak Week	9.18 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	4.09 Ml/d
	Peak Week	4.59 Ml/d

SOUTHERN WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
HAMPSHIRE BROUGHTON	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Broughton					4.36	4.36			
Horsebridge					2.88	2.88			
West Tytherley					0.00	0.00			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					7.24	7.24	3.62	3.62	3.62

TOTAL DEPLOYABLE OUTPUT	Average	7.24 Ml/d
	Peak Week	7.24 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	3.62 Ml/d
	Peak Week	3.62 Ml/d

SOUTHERN WATER SERVICES

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
HAMPSHIRE SOUTH & WINCHESTER	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Reservoirs				
None				
Run of River Schemes				
Otterbourne				44.40
Testwood				105.47
Groundwater Sources				
Otterbourne				
Twyford				
Timsbury				
Easton/Romsey Road				
Totford				
Barton Stacey				
Imports and Exports				
None				
RESOURCE ZONE TOTAL				149.87

TOTAL DEPLOYABLE OUTPUT	Average	256.00 Ml/d
	Peak Week	287.70 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	251.00 Ml/d
	Peak Week	282.70 Ml/d

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
Average	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
54.76	68.18			
18.00	23.00			
9.50	13.00			
18.20	27.30			
4.54	4.55			
1.13	1.80			
106.13	137.83	5.00	251.00	282.70

SOUTHERN WATER SERVICES

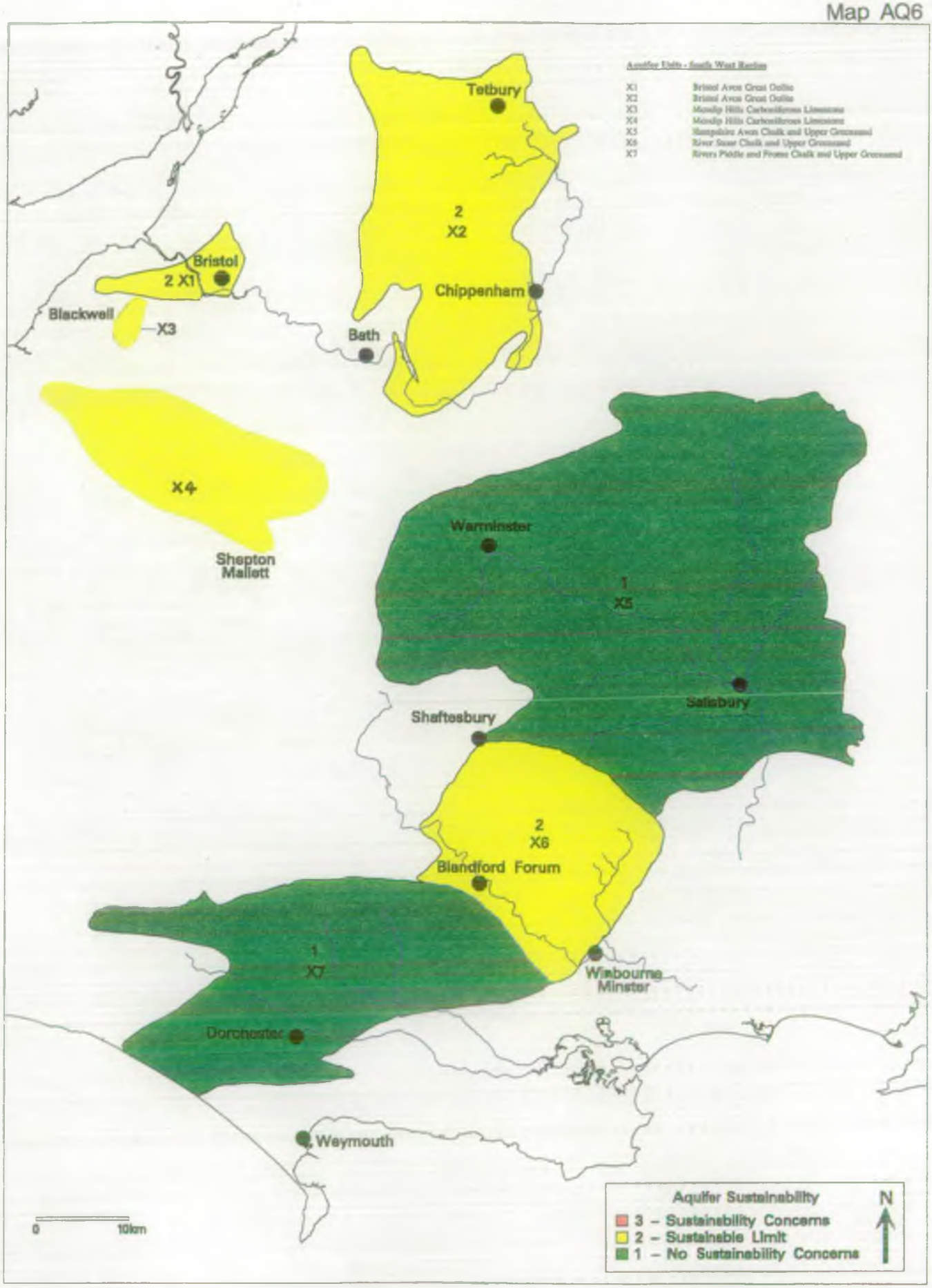
RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
KENT THANET	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
River Stour Scheme				2.74					
Groundwater Sources									
Sutton					4.40	4.40			
Ringwould					3.64	4.55			
Deal					3.40	3.40			
Flemings					8.70	8.70			
Martin Gorse					5.50	5.50			
Wingham					20.00	20.00			
Martin Mill					0.70	1.10			
Woodnesborough					2.49	2.73			
Eastry					0.00	0.00			
Dane					0.00	0.00			
Linksfield					0.00	0.00			
Lord of the Manor					6.00	6.50			
Minster A					0.00	0.00			
Minster B					5.50	5.50			
Rumfields					0.00	0.00			
Sparrow Castle					1.95	1.95			
Tivoli					0.00	0.00			
Imports and Exports									
None									
RESOURCE ZONE TOTAL				2.74	62.28	64.33	5.00	60.02	62.07

TOTAL DEPLOYABLE OUTPUT	Average	65.02 Ml/d
	Peak Week	67.07 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	60.02 Ml/d
	Peak Week	62.07 Ml/d

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	847.78 Ml/d	
TOTAL DEPLOYABLE OUTPUT	811.25 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-36.53 Ml/d	-4 %
1997 WATER AVAILABLE FOR USE	768.42 Ml/d	

SOUTH WEST REGION



AQUIFER SUSTAINABILITY - South West Region

Bournemouth and West Hampshire Water

Bournemouth and West Hampshire Water are supplied predominantly from surface water sources. The overall change in deployable output from previous yield figures is around 2% and is attributable to surface water assessment methods applied. Matchams and Knapp Mill abstractions account for the majority of reduction in yield. Surface water source deployable outputs used extended flow sequences (from 1883); 1934 has been adopted as the critical year. However, there is little scope for increasing the deployable output by operating the sources conjunctively within the zones.

No allowance was made in the prescribed methods for maintaining residual flows for environmental protection except where these are covered by existing abstraction licences. This, along with sustainability concerns, linked to the Stanbridge abstraction, will need further consideration as part of the company's water resources plan. The lack of data such as rest water level and pumped water level has reduced confidence in some of the groundwater assessments, and improvements in data available is necessary if application of the UKWIR groundwater methodology is to be improved in the future. An adapted version of the UKWIR method was used to calculate outage. This involved two levels of analysis, the second level of which will require further clarification.

Map 20

South West Region

BOURNEMOUTH AND WEST HAMPSHIRE WATER SUPPLY AREA

BOURNEMOUTH AND WEST HAMPSHIRE WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
ALDERNEY	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
Avon at Matchams				58.65					
Longham SW				29.33					
Groundwater Sources									
Longham GW					8.82	8.82			
Wimbourne					4.10	4.09			
Imports and Exports									
None									
RESOURCE ZONE TOTAL				87.98	12.92	12.91	0.30	100.60	100.59

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	100.90
	Peak Week	100.89
WATER AVAILABLE FOR USE (Ml/d)	Average	100.60
	Peak Week	100.59

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	226.87 Ml/d	
TOTAL DEPLOYABLE OUTPUT	223.03 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-3.84 Ml/d	-2 %
1997 WATER AVAILABLE FOR USE	222.00 Ml/d	

BOURNEMOUTH AND WEST HAMPSHIRE WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
HALE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Hale					12.45	15.50			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					12.45	15.50	0.17	12.28	15.33

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	12.45
	Peak Week	15.50
WATER AVAILABLE FOR USE (Ml/d)	Average	12.28
	Peak Week	15.33

BOURNEMOUTH AND WEST HAMPSHIRE WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
KNAPP MILL	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
Knapp Mill				82.31					
Groundwater Sources									
Ampress					2.37	2.73			
Imports and Exports									
None									
RESOURCE ZONE TOTAL				82.31	2.37	2.73	0.24	84.44	84.80

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	84.68
	Peak Week	85.04
WATER AVAILABLE FOR USE (Ml/d)	Average	84.44
	Peak Week	84.80

BOURNEMOUTH AND WEST HAMPSHIRE WATER

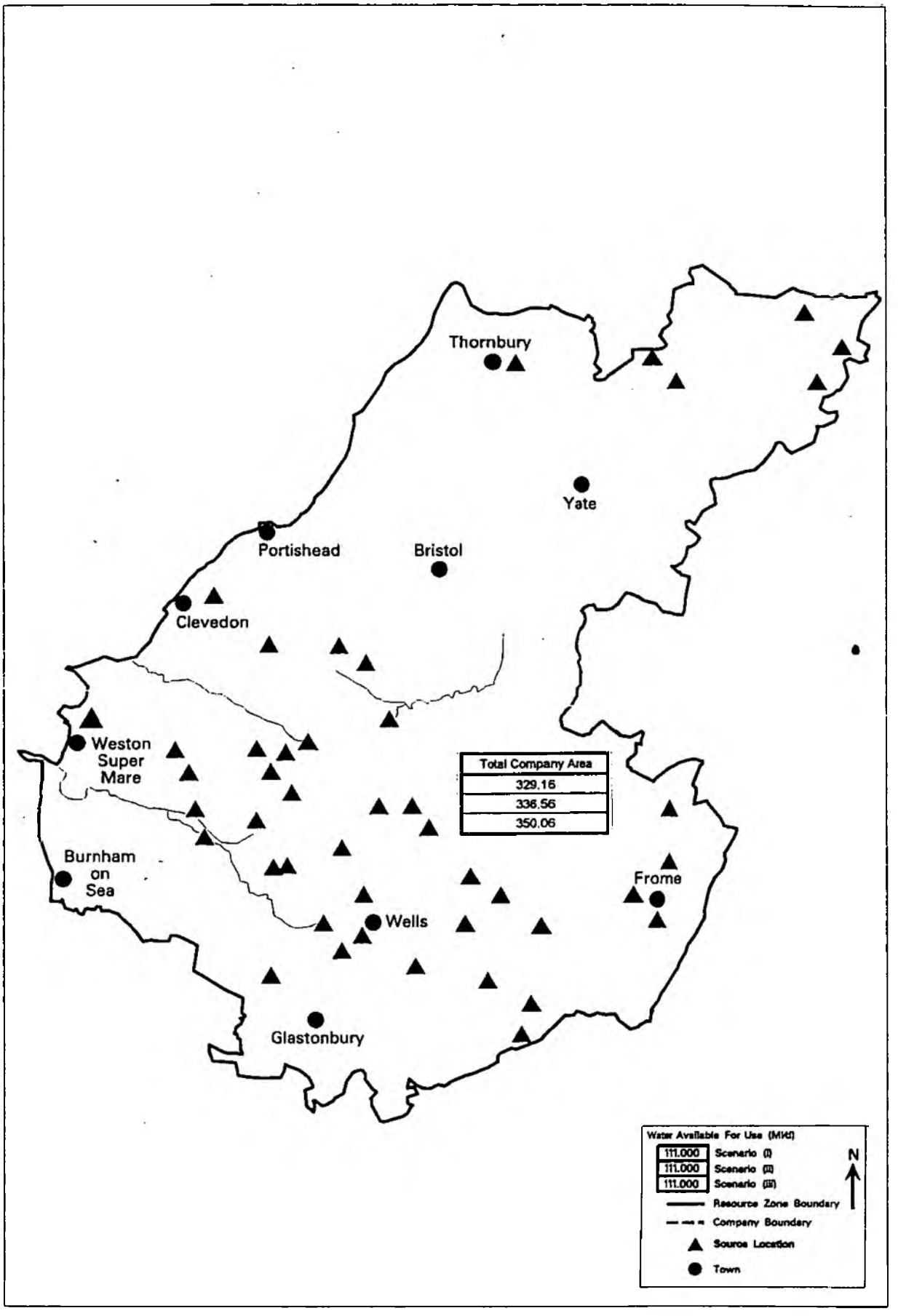
RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
STANBRIDGE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Stanbridge					25.00	25.00			
Imports and Exports									
None									
RESOURCE ZONE TOTAL				0.00	25.00	25.00	0.32	24.68	24.68

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	25.00
	Peak Week	25.00
WATER AVAILABLE FOR USE (Ml/d)	Average	24.68
	Peak Week	24.68

Bristol Water

The Bristol system comprises a single resource zone which conjunctively uses ground and surface water sources, the latter dominating the zone. The revised set of deployable outputs for the company is some 8% lower than previous yield estimates. This reduction is due to a reduction in the deployable output of both surface and groundwater sources.

The deployable output of the surface sources (when viewed in isolation) is 8% lower than previous yield estimates. There are also groundwater source reductions of approximately 3 Ml/d at Banwell Spring, 6 Ml/d at Oldford and 1.5 Ml/d at both Tetbury and Gurney Slade. The reductions calculated for sources in isolation, is somewhat offset by the application of conjunctive use modelling. The drought control line used in this modelling represents the most extreme drawdown during the period 1909 to 1997 (this was 1933-34).



South West Region
BRISTOL WATER SUPPLY AREA

BRISTOL WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
COMPANY-WIDE	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Reservoirs				
River Yeo (Congresbury) Blagdon Reservoir				
Chew Valley Lake				
Chew Magna Reservoir & Chew Stoke Stream				
Run of River Schemes				
Gloucester & Sharpness Canal (Purton WTW)				
River Yeo (Cheddar), Cox's Mill Pond				
Upper Langford Stream & Rickford Stream				
River Axe (Brinscombe Intake)				
Groundwater Sources				
Alderley - Ozleworth Stream				
Banwell Spring				
Blackdown Springs, Shipham				
Blagdon Spring				
Chaterhouse Springs and Boreholes				
Cold Bath Spring, Barrow Gurney				
Dundry-Elwell Streams, Barrow Gurney				
Ellenge Stream				
Holes Ash Springs, Wells				
Line of Works: Chew Hill Hd Spr& Garrow Spr				
Windsor and Yelling Springs, Shepton Mallet				
Sherbourne Springs, Litton				
Stoke Bottom Springs, Shepton Mallet				
West Compton Springs, Pilton				
Chelvey Well, Brockley				
Clevedon - Tickenham Road Well/Borehole				
Egford Wells, Frome				
Gurney Slade Well, Binegar				
Honeyhurst Well & Spr (Rodney Stoke Group				
Long Newnton Boreholes				
Oldford Borehole				
Priddy Well and Boreholes				
Shipton Moyne Well and Boreholes				
Tetbury Boreholes				
Winscombe Boreholes & Spring				
Imports and Exports				
Supply to Wessex Water				
SUB TOTAL	259.90	267.30	280.80	

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
Average	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
3.35					
7.28					
0.00					
0.00					
2.14					
0.00					
1.41					
0.84					
0.80					
0.00					
2.17					
4.74					
0.00					
0.66					
12.68					
2.37					
4.67					
1.45					
2.36					
7.87					
7.92					
0.41					
7.22					
1.58					
2.28					
74.20		4.94	329.16	336.56	350.06

BRISTOL WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
COMPANY-WIDE(Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
SUB TOTAL (See Previous Page)	259.90	267.30	280.80		74.20		4.94	329.16	336.56	350.06
RESOURCE ZONE TOTAL	259.90	267.30	280.80		74.20		4.94	329.16	336.56	350.06

TOTAL DEPLOYABLE OUTPUT (Ml/d)

Scenario 1	334.10	
Scenario 2	341.50	
Scenario 3	355.00	
Change from Scenario 3 to Scenario 1	20.90 Ml/d	6 %
Change from Scenario 3 to Scenario 2	13.50 Ml/d	4 %

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	370.00 Ml/d	
SCENARIO DEPLOYABLE OUTPUT	341.50 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-28.50 Ml/d	-8 %
1997 WATER AVAILABLE FOR USE	336.56 Ml/d	

NOTES

1. Peak week groundwater deployable outputs not supplied, so results not reported
2. Total deployable output for surface water system based on modelling of the entire system. So individual source deployable outputs have therefore not been provided and have not been reported.

Cholderton and District Water Company

The Cholderton system is based on groundwater sources. The revised deployable output has not changed. The UKWIR methodology for groundwater was applied. There is presently insufficient data to assess the environmental constraints on the source.

South West Region

CHOLDERTON AND DISTRICT WATER SUPPLY AREA

CHOLDERTON AND DISTRICT WATER COMPANY

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
COMPANY-WIDE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Cholderton Boreholes					0.77	1.35			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					0.77	1.35	0.00	0.77	1.35

TOTAL DEPLOYABLE OUTPUT	Average	0.77 Ml/d
	Peak Week	1.35 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	0.77 Ml/d
	Peak Week	1.35 Ml/d

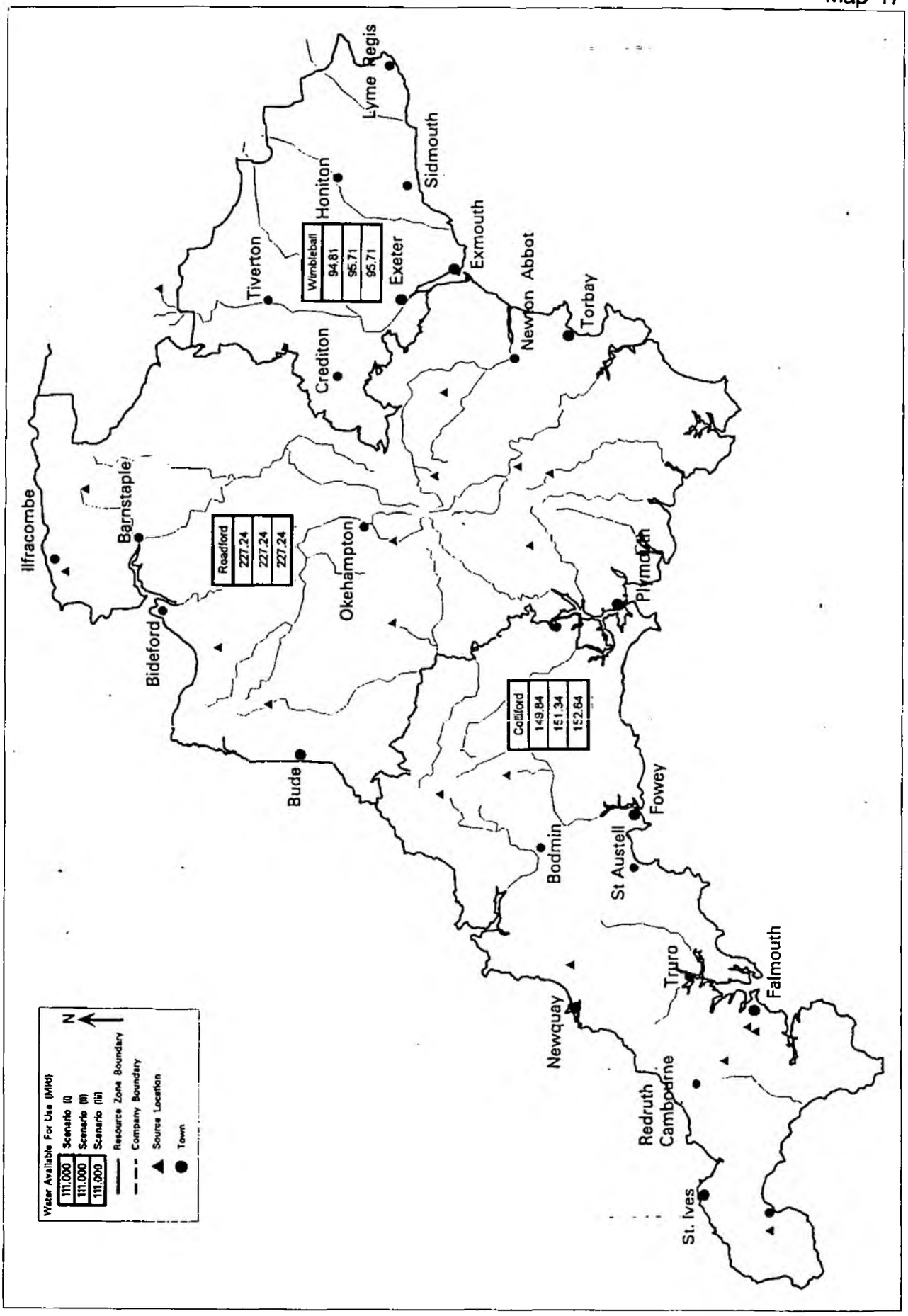
WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	0.77 Ml/d	
AVERAGE DEPLOYABLE OUTPUT	0.77 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	0.00 Ml/d	0 %
1997 WATER AVAILABLE FOR USE	0.77 Ml/d	

South West Water

South West Water are predominantly dependent on surface water sources, although there are important groundwater sources in the east of the supply area. The apparent significant reduction in deployable output for the company is largely due to incompatibility with the assessment method previously used, which calculated peak four week yield. The real reduction is of the order of 5%. Significant progress has been made in extending existing flow sequences to allow detailed conjunctive use analysis of surface water systems.

Further work is necessary to resolve outstanding anomalies in the Colliford zone. Different groundwater yields have been used in conjunctive use modelling to reflect the benefit to be gained from this operation and to allow for differences in groundwater assessment methods. Sustainability issues associated with the groundwater in East Devon, and resources on the Tavy need to be addressed in the company's water resources plan. Outage figures have been derived for each resource zone allowing WAFU to be calculated. An operational assessment was used in preference to the UKWIR method based on recorded outages.



South West Region

SOUTH WEST WATER SUPPLY AREA

SOUTH WEST WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
COLLIFORD	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Stithians Reservoir										
Argal & College Reservoirs										
River Cober (Wendron)										
Drift Reservoir										
Cargenwyn Reservoir										
River Fowey at Trekeivesteps										
Colliford Lake										
River Fowey/Restonmel										
River Porth at Rialton										
Crowdy Reservoir										
Withey Brook at Bastreet										
Siblyback Reservoir										
Run of River Schemes										
Kennal Vale										
River Hayle										
Carwynnen Stream u/s Botetoe Bridge										
Roseworthy Stream										
Boswyn Stream										
De Lank River										
Groundwater Sources										
Polteggan Well										
Boswyn Shaft, Copper Hill Adit										
Fostescue Shaft										
Trewollack Mineshaft										
Imports and Exports										
Imports into Colliford Strategic Supply Area										
RESOURCE ZONE TOTAL	150.00	151.50	152.80				0.16	149.84	151.34	152.64

TOTAL DEPLOYABLE OUTPUT (Ml/d)		
	Scenario 1	150.00
	Scenario 2	151.50
	Scenario 3	152.80
	Change from Scenario 3 to Scenario 1	2.80 Ml/d 2 %
	Change from Scenario 3 to Scenario 2	1.30 Ml/d 1 %

NOTES

1. Deployable output under the three scenarios for surface water systems reported for Case X ie based on the maximum depletion that occurs with a 5 year refill period, during the period 1962 to 1996.
2. Deployable output for individual sources included in the total at the bottom of columns
3. Deployable output calculations based on conjunctive use modelling, so total deployable output figures 'as modelled' reported.

SOUTH WEST WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
ROADFORD	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Upper Tamar Lake										
Gammaton Reservoir										
Melbury Reservoir										
West Okement River Meldon Reservoir										
Holywell Reservoir										
Wistlandpound Reservoir										
River Taw (Newbridge)										
Slade Reservoirs										
Fernworthy Reservoir										
Kennick, Tottiford & Trenchford Reservoirs										
Old Mill Reservoir Dartmouth										
Venford Reservoir										
Avon Reservoir										
Butterbrook Reservoir										
Burrator Reservoir										
Roadford Reservoir										
River Tamar at Gunnislake										
Run of River Schemes										
Thomes Intake at Kenton										
Red-A-Ven & Black-A-Ven										
River Yeo at Loxhore										
River Bray at Leehamford										
Brockenburrow Intake										
West Ilkerton River										
River Dart										
Swincombe Intake										
Bala Brook Intake										
Devonport Leat										
West Dart River Cowsic River Blackabrook										
River Erme Red Lake & Left Lake										
River Yealm Broadall Lake Ford Brook										
Devonport Leat (Dousland Intake)										
River Meavy (Stanleke Intake)										
River Tavy at Lopwell										
SUB TOTAL										

SOUTH WEST WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
WIMBLEBALL	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Squabmoor Reservoir (Yettington Intakes)										
Pynes Leat										
Wimbleball Pumped Storage										
River Exe (Bolham)										
Run of River Schemes										
Budleigh Brook										
River Exe - North Bridge Intake										
River Exe (Sawdust Pool)										
Groundwater Sources										
Wilmington Springs										
Hook & Cotley Springs										
Couchill Springs										
Holyford Ponds										
Bovey Lane Boreholes										
Pinhay Springs										
Greatwell 4B Borehole										
St Cyres Springs										
Sidford 3 Borehole										
Kersbrook Springs										
Greatwell Boreholes										
Colaton Raleigh										
Greatwell 5P Borehole										
Harpford Boreholes										
Dotton Boreholes										
Otterton Boreholes										
Aller Springs										
Brampford Speke Borehole										
Stoke Cannon Borehole										
Sheldon Springs										
Uton Borehole										
Coleford Borehole										
Knowle Borehole										
Clannaborough (Watson) Adit										
SUB TOTAL										

SOUTH WEST WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
ROADFORD (Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Groundwater Sources										
Taw Marsh (11 Boreholes)										
Fairhill Borehole										
Chagford Springs										
Duckaller Borehole										
Vennbridge Borehole										
Mylor Borehole										
Brixham Spring										
Halsanger Springs										
Brockhill Mire Lambsdown Springs										
Littlehampton Radial Collector Wells & BHs										
Wheal Lucky Adit, Mt View & Wheel Luck Spr										
Imports and Exports										
Import from Wimbleball Strategic Supply Area										
RESOURCE ZONE TOTAL	236.73	236.73	236.73				9.49	227.24	227.24	227.24

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	236.73		
	Scenario 2	236.73		
	Scenario 3	236.73		
	Change from Scenario 3 to Scenario 1		0.00 Ml/d	0 %
	Change from Scenario 3 to Scenario 2		0.00 Ml/d	0 %

NOTES

1. Deployable output under the three scenarios for surface water systems reported for Case A, ie with the constraints of Littlehempston WTW, the Spine main and Northcombe WTW in place.
2. Deployable output for individual sources included in the total at the bottom of columns
3. Figures excludes exports from Roadford Strategic Supply Area (SSA), and excludes imports to Roadford SSA
4. Deployable output calculations based on conjunctive use modelling, so total deployable output figures 'as modelled' reported.

SOUTH WEST WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
WIMBLEBALL(Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Imports and Exports										
River Exe (Exebridge), Exe-Taw Transfer										
RESOURCE ZONE TOTAL (See Notes)	94.85	95.75	95.75		7.00	7.00	0.05	94.81	95.71	95.71

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Scenario 1	94.85		
	Scenario 2	95.75		
	Scenario 3	95.75		
	Change from Scenario 3 to Scenario 1		0.90 Ml/d	1 %
	Change from Scenario 3 to Scenario 2		0.00 Ml/d	0 %

NOTES

1. Deployable output for individual sources included in the total at the bottom of columns
2. Figures excludes exports from the Wimbleball Strategic Supply Area (SSA) to the Roadford SSA, but excludes exports to Wessex Water. The figure also excludes imports to the Wimbleball SSA from the Roadford SSA.
3. Deployable output calculations based on conjunctive use modelling, so total deployable output figures 'as modelled' reported.

WATER COMPANY SUMMARY

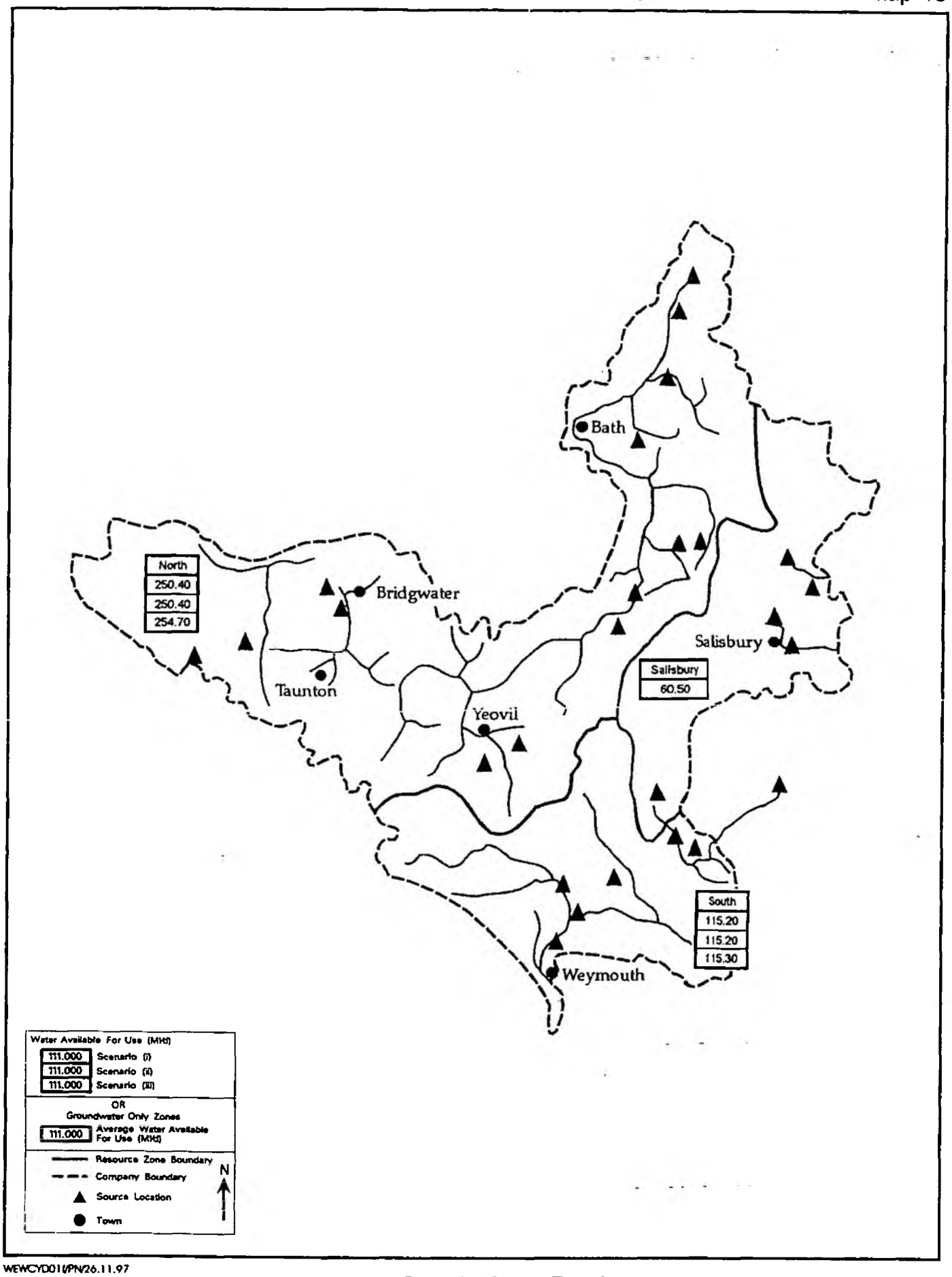
PREVIOUS YIELD ESTIMATES	605.90 Ml/d	Previous yield based on peak 4 week yield, so figures not directly comparable (see also Table 4.2)	
AVERAGE DEPLOYABLE OUTPUT	483.98 Ml/d		
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-121.92 Ml/d	-20 %	
1997 WATER AVAILABLE FOR USE	474.29 Ml/d		

Wessex Water Services

The Wessex system is predominantly made up of groundwater sources. The revised set of deployable outputs for the company is some 7% lower than previous yield estimates. This reduction is not clearly attributable to any particular source type. The deployable outputs of the groundwater sources are generally lower than previous yields which is not surprising considering the use of the UKWIR methodology.

Significant changes include a 9 Ml/d reduction at Briantspuddle which preempts a forthcoming sustainability reduction and a 5 Ml/d reduction at Durleigh and a 3 Ml/d reduction at Sutton Bingham.

There is no evidence of a gain in deployable output as a result of conjunctive use in the North resource zone, although the Agency believes that this should be available to the company. Further work in this area would be of value as part of the company's water resources plan. The lack of key data for many sites, such as rest water levels and pump water levels is an issue that must be addressed to allow proper assessments in the future. No attempt has been made to calculate outage figures and therefore there is no figure for WAFU.



WEWCYD01/PN/26.11.97

South West Region
WESSEX WATER SERVICES SUPPLY AREA

WESSEX WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
SALISBURY	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Reservoirs				
None				
Run of River Schemes				
None				
Groundwater Sources				
Barton Hill				
Berwick St John Well				
Black Lane				
Boyne Hollow				
Bulbridge				
Clarendon				
Compton				
Deans Farm				
Devizes Road				
Ditchampton				
Donhead				
Durrington				
Fonthill Bishop				
Fovant				
Leckford Bridge				
Motcombe				
New park Wood Springs, Chalton Musgrove				
Newton Toney				
Shrewton				
Stubhampton				
Wylye				
Wyndham Road				
Deduction for Barton Hill Group				
Deduction for Berwick Group				
Deduction for Clarendon Group				
Deduction for Deans Farm Group				
Imports and Exports				
None				
RESOURCE ZONE TOTAL				

TOTAL DEPLOYABLE OUTPUT	Average	60.50 Ml/d
	Peak Week	69.60 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	See Notes
	Peak Week	See Notes

5 March 1998

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
Average	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
0.40	0.40			
0.00	0.00			
8.00	10.50			
0.80	0.90			
0.80	0.80			
9.60	9.60			
2.70	3.90			
11.80	12.00			
0.90	4.90			
0.00	0.00			
0.50	0.50			
4.90	6.50			
7.00	7.00			
1.20	1.20			
1.20	1.20			
0.00	0.00			
0.00	0.00			
6.60	6.60			
1.10	1.10			
2.20	2.20			
0.80	0.80			
0.00	0.00			
0.00	0.00			
0.00	-0.50			
0.00	0.00			
0.00	0.00			
60.50	69.60	See Notes	See Notes	

WESSEX WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
NORTH	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Reservoirs				
Ashford	7.00	7.00	7.50	
Clatworthy	18.50	18.50	20.00	
Durleigh	13.30	13.30	14.40	
Fulwood (Luxhay)	7.10	7.10	7.50	
Nutscale	1.90	1.90	2.00	
Sutton Bingham	12.30	12.30	13.00	
Run of River Schemes				
Brue at Westhay Bridge, Meare				0.00
Monkton Combe				0.00
Newton Meadows				0.00
Groundwater Sources				
Aller Park Spring				
Am Hill				
Batheaston Springs				
Bishop Cannings				
Bossington				
Bourton				
Bradley Head				
Brixton Deverill				
Broadwood Spring				
Buckland Newton				
Calstone Springs				
Castle Cary				
Castleton				
Cattistock				
Charlton				
Cherhill				
Chipstable				
Chirton				
Chitterne				
Codford				
Compton Durville				
Corscombe Springs				
Cowbridge				
Cudworth				
SUB TOTAL	60.10	60.10	64.40	0.00

NOTES

1. Outage figures not calculated by water company, so 'water available for use' set to be equal to total deployable output.

5 March 1998

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
Average	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
0.00	0.00				
0.60	0.60				
1.00	1.20				
0.90	0.90				
0.80	1.40				
0.80	0.80				
1.20	1.50				
9.00	9.40				
0.40	0.40				
0.50	0.50				
0.90	0.90				
0.00	0.00				
1.90	2.20				
0.70	0.70				
13.00	13.00				
0.80	0.80				
0.00	0.00				
2.20	2.20				
16.00	16.00				
6.00	6.00				
3.00	3.00				
0.40	0.40				
7.50	7.50				
0.00	0.00				
67.60	69.40				

WESSEX WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
NORTH (Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*	
SUB TOTAL (See Previous Page)	60.10	60.10	64.40	0.00
Groundwater Sources (Contd.)				
Cutcombe-Blagdon Spring				
Cutcombe-Wheddon X				
Divers Bridge				
Doddington				
Dommett Springs				
Dunkerton Springs				
Easterton				
Erlestoke				
Goodshill				
Heytesbury				
Holt				
Ivyfields				
Kingston Deverill Well				
Kingswood Warren				
Lacock				
Lake				
Langridge Springs				
Luccombe Springs				
Maiden Beech				
Mere				
Middlecombe Spring				
Midford Springs				
Milbourne Wick				
Milbourne				
Monkswood Springs				
Moorbrake				
Oakford Spring				
Payton Springs				
Penselwood				
Penton Hill Springs				
Pitcombe Spring				
SUB TOTAL	60.10	60.10	64.40	

DEPLOYABLE OUTPUT (Ml/d) - Sub Total Average
Peak Week

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
Average	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
67.60	69.40				
0.00	0.00				
0.10	0.30				
3.90	4.50				
0.30	0.30				
0.00	0.00				
3.80	4.10				
0.70	0.70				
0.00	0.00				
0.00	0.00				
9.00	9.00				
7.50	7.50				
6.00	6.00				
0.00	0.00				
0.30	0.30				
1.90	1.90				
8.20	10.00				
0.00	0.00				
0.40	0.40				
0.20	0.20				
7.80	7.80				
0.00	0.00				
1.60	1.70				
0.80	0.80				
5.50	5.50				
1.30	1.40				
0.10	0.30				
0.80	0.90				
0.00	0.00				
0.60	0.60				
0.00	0.00				
0.10	0.10				
128.50	133.70				

WESSEX WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
NORTH (Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*	
SUB TOTAL (See Previous Page)	60.10	60.10	64.40	
Groundwater Sources (Contd.)				
Pitt Farm				
Pole Rue				
Rodbourne				
Shepherds Shore				
Stapley Spring				
Stockwood Springs				
Tatworth				
Traphole Springs				
Tucking Mill Springs				
U. Whitb and Knapps Gate, Corsley, Westbury				
Upton Scudamore Springs				
Upton Scudamore Boreholes				
Washford Road Spring				
Waterloo Farm				
Waterrow Spring				
Wayford Spring				
Wellhead				
Westford Springs, Wellington				
Westleigh				
Weston Springs				
Widdenham Springs				
Withypool Springs				
Wiveliscombe				
Woolcombe Springs				
Yatesbury				
Reduction for Malmesbury Group				
Imports and Exports				
Wimbleball (Import from South West Water)				31.80
RESOURCE ZONE TOTAL (See Notes)	60.10	60.10	64.40	31.80

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Scenario 1	250.40	
	Scenario 2	250.40	
	Scenario 3	254.70	
	Change from Scenario 3 to Scenario 1		0.02 Ml/d
	Change from Scenario 3 to Scenario 2		0.02 Ml/d

5 March 1998

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
Average	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
128.50	133.70				
0.00	0.00				
4.50	4.50				
13.00	13.00				
1.20	1.20				
0.00	0.00				
0.40	0.50				
1.40	1.40				
0.10	0.20				
1.20	1.30				
0.00	0.00				
0.00	0.00				
5.10	5.10				
0.00	0.00				
0.70	0.70				
0.00	0.00				
0.30	0.30				
0.70	0.70				
0.00	0.00				
0.00	0.00				
0.10	0.10				
0.80	0.90				
0.00	0.00				
0.00	0.00				
0.40	0.50				
0.20	0.20				
-0.10	-0.10				
	45.50				
190.30	209.70				

2 %
2 %

WESSEX WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
SOUTH	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Reservoirs				
Blashford Lakes	1.50	1.50	1.60	
Run of River Schemes				
Watford Bridge				0.00
Groundwater Sources				
Alton Pancras				
Belhuish				
Briantspuddle				
Chaldon				
Corfe Castle				
Corfe Mullen				
Dewlish				
Eagle Lodge				
East Lulworth				
Empool				
Forston				
Friar Waddon				
Hooke Springs				
Ibberton Springs				
Langdon				
Litton Cheney				
Litton Cheney Spring				
Maiden Newton				
Milbourne St Andrew				
Oxeford Fitzpaine Spring				
Portesham				
Shapwick				
Sturminster Marshall				
Sutton Poyntz				
Ulwell				
Wessex Road				
West Lulworth Borehole				
West Lulworth Spring				
Winterbourne Abbas				
Deduction for Eagle Lodge Group				
Deduction for Belhuish Group				
Deduction for Litton Cheney Group				
Imports and Exports				
None				
SUB TOTAL	1.50	1.50	1.60	0.00

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
Average	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
3.70	4.50			
6.90	6.90			
9.10	9.10			
0.00	0.00			
0.00	0.00			
22.80	27.00			
3.90	3.90			
7.00	8.20			
0.00	0.00			
12.50	19.10			
1.90	1.90			
6.60	6.60			
0.80	0.90			
0.00	0.00			
0.60	0.60			
3.40	3.40			
0.00	0.00			
0.60	0.60			
4.50	4.50			
0.50	0.60			
0.80	0.80			
5.20	5.20			
15.90	20.00			
4.70	4.80			
0.40	0.40			
0.00	0.00			
0.00	0.00			
0.20	0.20			
1.70	2.80			
0.00	0.00			
0.00	0.00			
0.00	0.00			
113.70	132.00	See Notes	See Notes	

WESSEX WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
SOUTH (Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
SUB TOTAL (See Previous Page)	1.50	1.50	1.60	0.00	113.70	132.00	See Notes	See Notes		

TOTAL DEPLOYABLE OUTPUT (Ml/d)		
	Scenario 1	115.20
	Scenario 2	115.20
	Scenario 3	115.30

Change from Scenario 3 to Scenario 1	0.10 Ml/d	0 %
Change from Scenario 3 to Scenario 2	0.10 Ml/d	0 %

WATER COMPANY SUMMARY

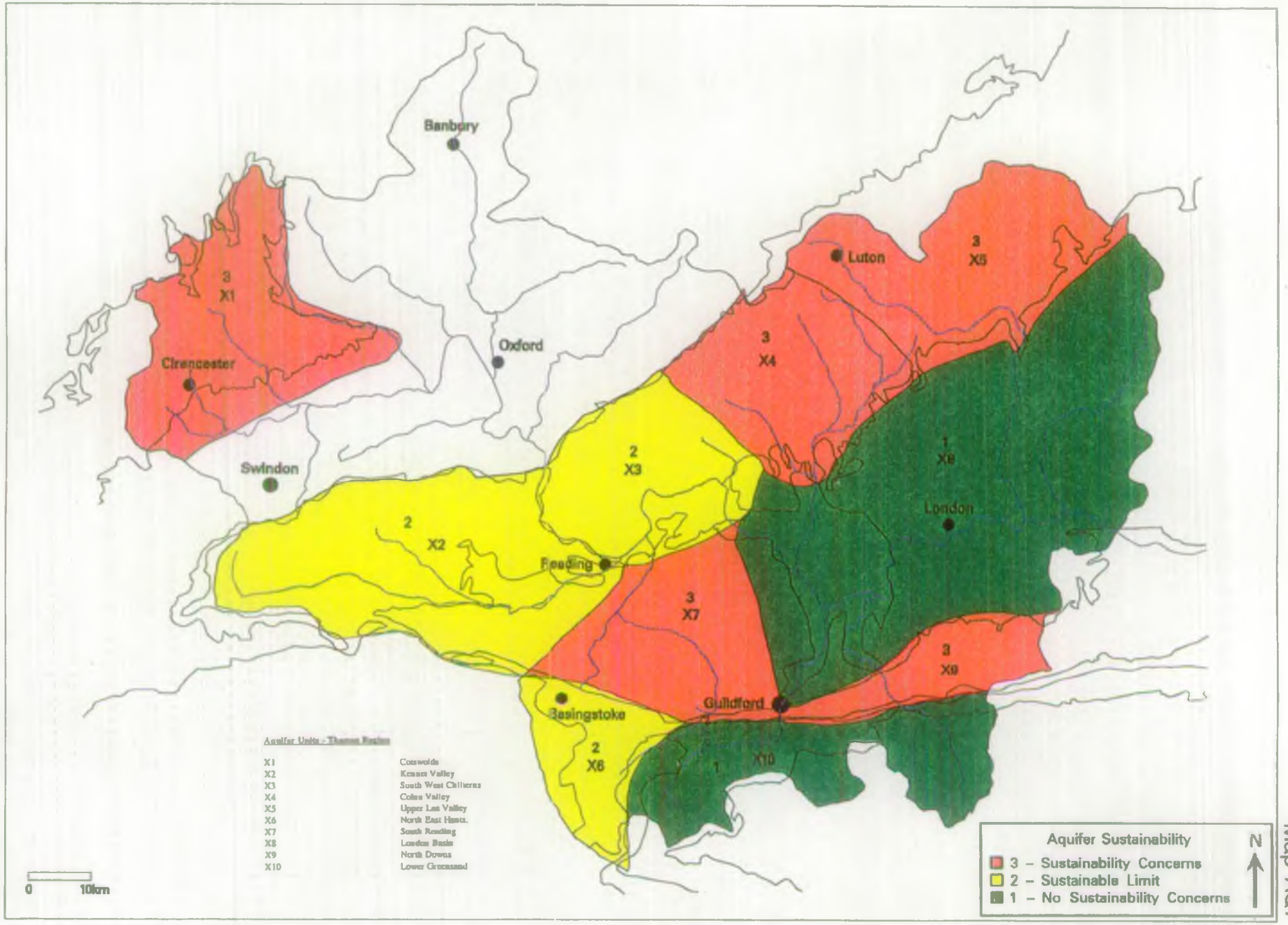
PREVIOUS YIELD ESTIMATES	453.73 Ml/d	
AVERAGE DEPLOYABLE OUTPUT	426.10 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-27.63 Ml/d	-6 %
1997 WATER AVAILABLE FOR USE	426.10 Ml/d	

NOTES

1. Outage figures not calculated by water company, so water available for use to be equal to total deployable output.

THAMES REGION

AQUIFER SUSTAINABILITY - Thames Region



Map AQ7

Mid-Southern Water

The Company supplies parts of eastern Berkshire, west Surrey and NE Hampshire.

The Company has identified 2 resource zones:

Northern Zone	-	combined surface and ground water
Southern Zone	-	groundwater

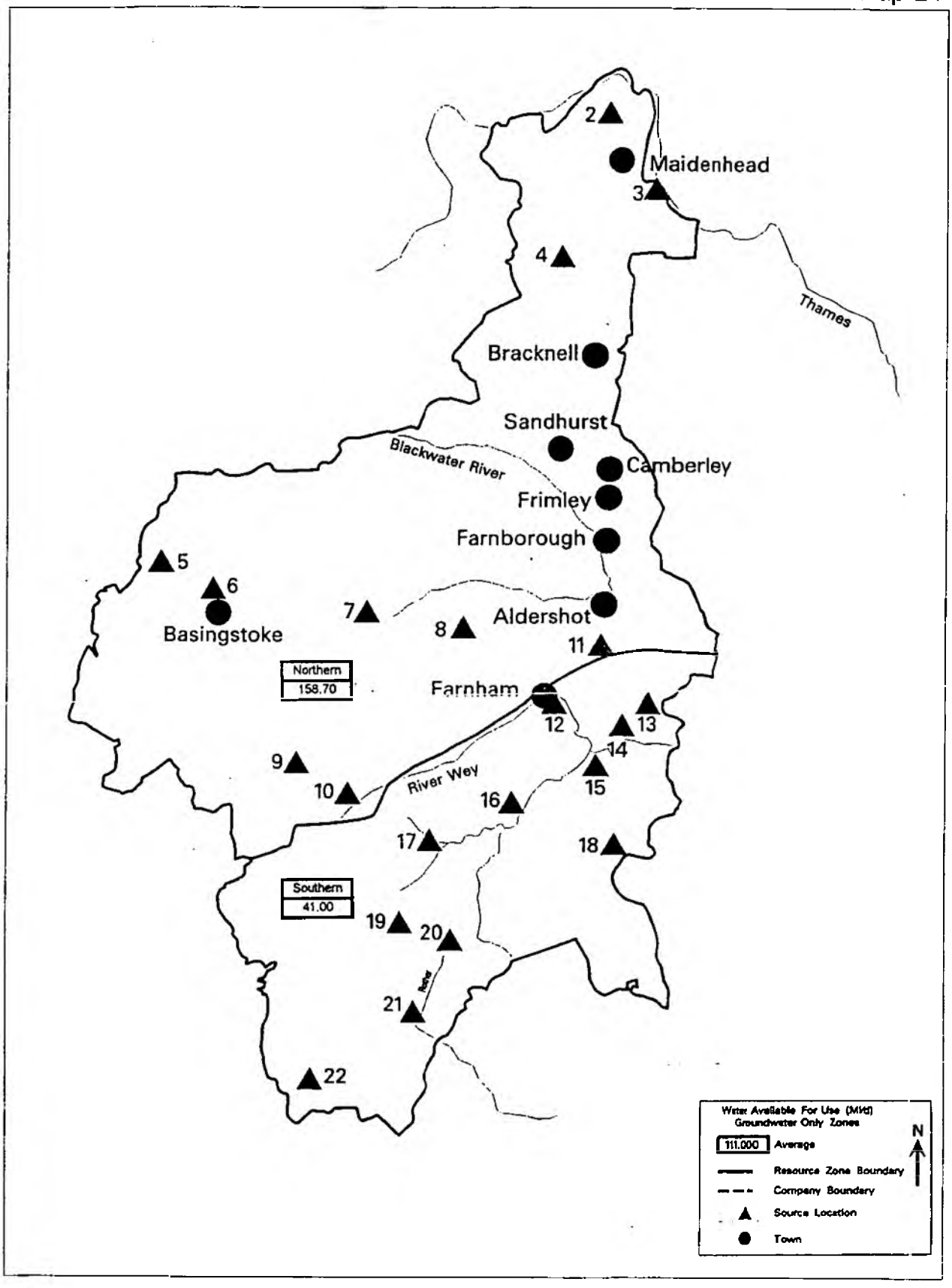
There are limited capacity links between the two zones, the Southern zone being reliant mainly on local groundwater sources.

Key Points:

- In a number of cases, the review has resulted in a decrease in deployable outputs. However, the Company has identified a range of measures (new / rehabilitation of boreholes, additional treatment etc) which could significantly increase its deployable yield.

- The Company's estimate of outage (8% Northern Zone, 13% Southern Zone) appears high. In the Northern Zone this reflects current water quality constraints at Bray and infrastructure limitations. In the Southern Zone, localised groundwater sources and limited infrastructure links increase risk. In both cases, the Company has identified potential investment in enhanced treatment and infrastructure which will reduce the assessed level of Outage in due course.

Map 24



Thames Region

MID SOUTHERN WATER SUPPLY AREA

MID SOUTHERN WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
NORTHERN	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
Bray (Conjunctive Use)				45.00					
Groundwater Sources									
Alton					4.60	9.10			
Beenhams Heath					25.50	27.80			
Hurley, Toutley, Boxhalls Lane & Tongham					18.90	22.70			
College Avenue					16.20	18.20			
Cookham					15.00	19.00			
Greywell					6.20	6.20			
Itchell					4.90	6.00			
Lasham					14.90	20.40			
Cliddesden					18.30	27.50			
Woodgarston					5.20	7.40			
Imports and Exports									
36 Ml/d Bulk Transfer from North Surrey Water				+36.00					
RESOURCE ZONE TOTAL				45.00	127.70	166.30	14.00	158.70	197.30

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	172.70
	Peak Week	211.30
WATER AVAILABLE FOR USE (Ml/d)	Average	158.70
	Peak Week	197.30

NOTES

1. The exact quantities of import and export water into water company supply area have not been reported, so net deployable outputs not calculated.

MID SOUTHERN WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
SOUTHERN	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Bourne					3.00	3.20			
Britty Hill					2.80	3.20			
East Meon					1.00	1.10			
Greatham					5.20	8.60			
Hawkley					0.40	0.70			
Headley Park					9.10	12.70			
Hindhead&Tower Road					0.60	0.60			
Oakhanger					4.00	4.50			
Sheet&Oakshott					3.40	4.70			
Tilford Meads					6.50	5.70			
Tilford, Wellesley Road & Rushmoor					9.00	9.00			
Woodhanger					0.00	0.00			
Imports and Exports									
From Southern EA									
RESOURCE ZONE TOTAL					45.00	54.00	4.00	41.00	50.00

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	45.00
	Peak Week	54.00
WATER AVAILABLE FOR USE (Ml/d)	Average	41.00
	Peak Week	50.00

NOTES

1. This is a groundwater only resource zone, so no results for surface water scenarios not reported.
2. A lower outage figure of 4 Ml/d suggested in Saur Water Services correspondence with the Agency dated 8 January. This figure has been used to calculate water available for use.

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	303.22 Ml/d	
1997 DEPLOYABLE OUTPUT	217.70 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-85.52 Ml/d	-28 %
1997 WATER AVAILABLE FOR USE	199.70 Ml/d	

North Surrey Water

The Company supplies Surrey, north of Guildford to the Thames, and parts of the west London boroughs of Hillingdon, Ealing and Hounslow.

The Company is made up of one resource zone and is largely dependent (86%) upon surface water abstraction from the River Thames at Egham, Chertsey and Walton, the remainder from groundwater.

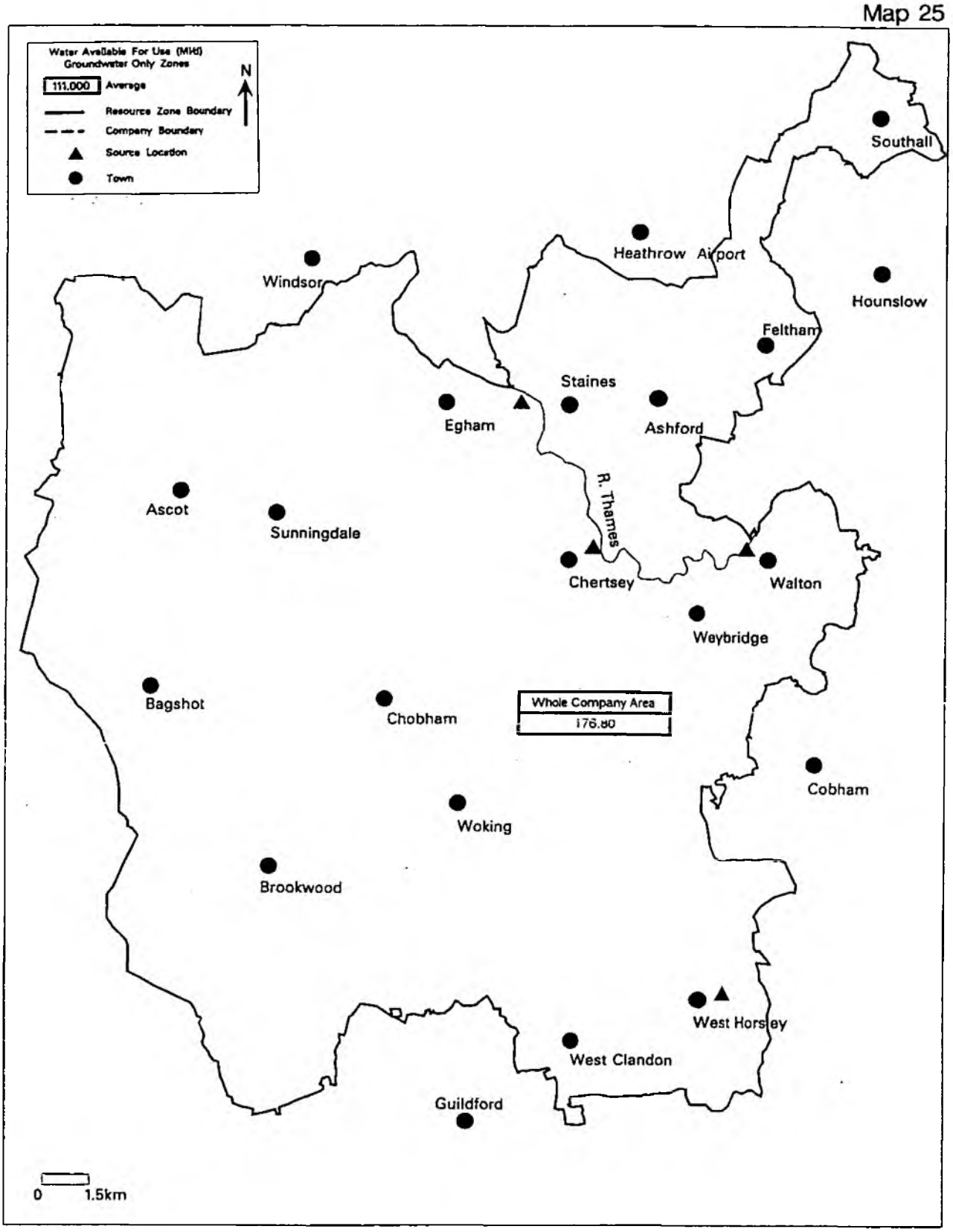
Key Points:

- The Company reports that its deployable output from surface water sources is constrained under peak conditions by treatment capacity and treatment losses. The deployable output could be improved towords the peak licence quantity with appropriate investment as and when required.

- Proposed new works at the Chertsey groundwater source are anticipated to increase the deployable output towards the full licence quantity.

- The Company's assessment of outage at 7.8% under average conditions could be reduced in line with the availability of its gravel lake emergency sources to manage pollution and nitrate issues and largely relate, therefore, to plant issues (power failure, cleaning & regeneration). Under peak conditions the situation may be more critical.

Map 25



Thames Region

NORTH SURREY WATER SUPPLY AREA

NORTH SURREY WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
COMPANY-WIDE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
River Thames				170.70					
Groundwater Sources									
Chertsey					20.00	18.50			
Clandon					0.30	0.50			
Horsley					0.30	0.88			
Imports and Exports									
Imports from Thames Water's Guildford Zone									
38 Ml/d Export to Mid Southern Water				-36.00					
							18.90 (Peak Outage)		
RESOURCE ZONE TOTAL				170.70	20.60	19.88	14.50	176.80	176.08

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	191.30
	Peak Week	190.58
WATER AVAILABLE FOR USE (Ml/d)	Average	176.80
	Peak Week	176.08

WATER COMPANY SUMMARY

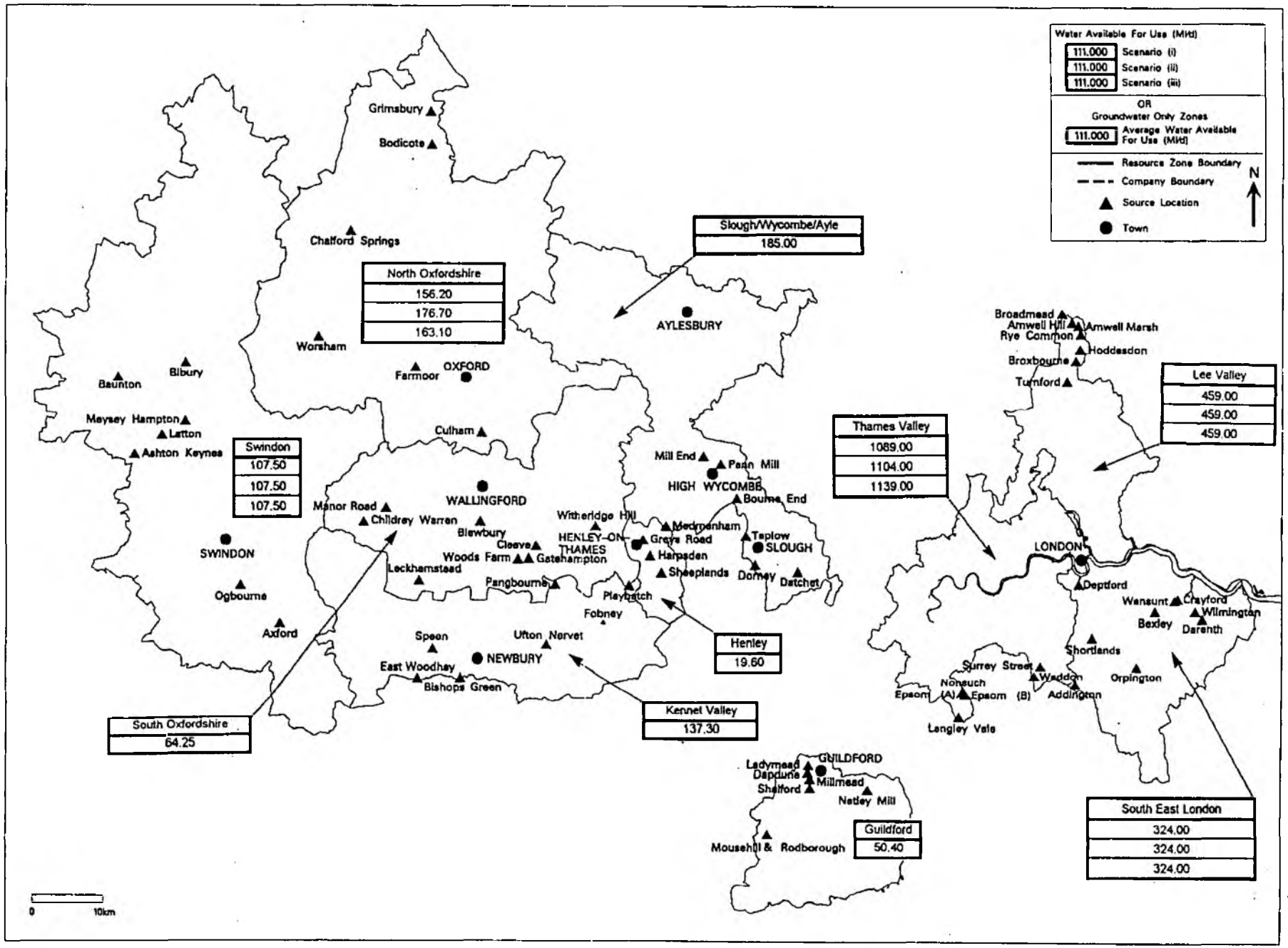
PREVIOUS YIELD ESTIMATES	181.19 Ml/d	
1997 DEPLOYABLE OUTPUT	191.30 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	10.11 Ml/d	6 %
1997 WATER AVAILABLE FOR USE	176.80 Ml/d	

NOTES

1. Information on imports into water company supply area from Thames Water was not available, therefore net deployable outputs have not been calculated.

Thames Region

THAMES WATER UTILITIES SUPPLY AREA



Map 22

Sutton & East Surrey Water

The Company supplies the London Boroughs of Sutton, parts of Merton and Kingston, east Surrey, Crawley and west Kent.

The Company has identified two resource zones:

Sutton	-	Groundwater
E Surrey	-	Surface / Reservoir and groundwater

Key Points:

- The review of Bough Beech reservoir has resulted in a significant reduction in deployable output.

- The Company has identified a number of sources in its East Surrey zone where the deployable output is constrained by sourceworks (e.g. pump capacity, treatment etc). In a number of cases, measures have been identified which could increase deployable outputs as and when required towards licence quantities.

- Source potential within the Sutton zone have been largely fully developed. The Company is actively investigating the potential for new sources in the area.

- The Company's assessment of outage is high in the case of its East Surrey zone, allowing for the complete loss of the Bough Beech reservoir through pollution.

SUTTON AND EAST SURREY WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
EAST SURREY	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Bough Beech	27.40	27.40	27.40							
Run of River Schemes										
None										
Groundwater Sources										
Warwick Wold/Brewer St					6.73	6.73				
Cliftons Lane Group					2.27	4.55				
Leatherhead Group					49.30	62.60				
Dorking					8.90	11.00				
Kenley Group					22.80	49.00				
Paines Hill Spring					0.65	0.65				
Westwood Group					6.85	9.45				
Godstone Group					7.98	12.89				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	27.40	27.40	27.40		105.48	156.87	5.87 (Water Unavailable) 25.90	101.11	101.11	101.11

TOTAL DEPLOYABLE OUTPUT (Ml/d)		
	Scenario 1	132.88
	Scenario 2	132.88
	Scenario 3	132.88

Change from Scenario 3 to Scenario 1	0.00 Ml/d	0 %
Change from Scenario 3 to Scenario 2	0.00 Ml/d	0 %

NOTES

1. Water available for use computed as total deployable output less outage, less water unavailable

SUTTON AND EAST SURREY WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
SUTTON	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Woodmansterne Group					25.00	26.00			
Oaks/Woodcote					9.10	10.00			
Cheam/Sutton Group					32.90	36.00			
Hackbridge					5.00	8.00			
Imports and Exports									
None									
							1.49 (Water Unavailable)		
RESOURCE ZONE TOTAL					72.00	80.00	4.00	66.51	74.51

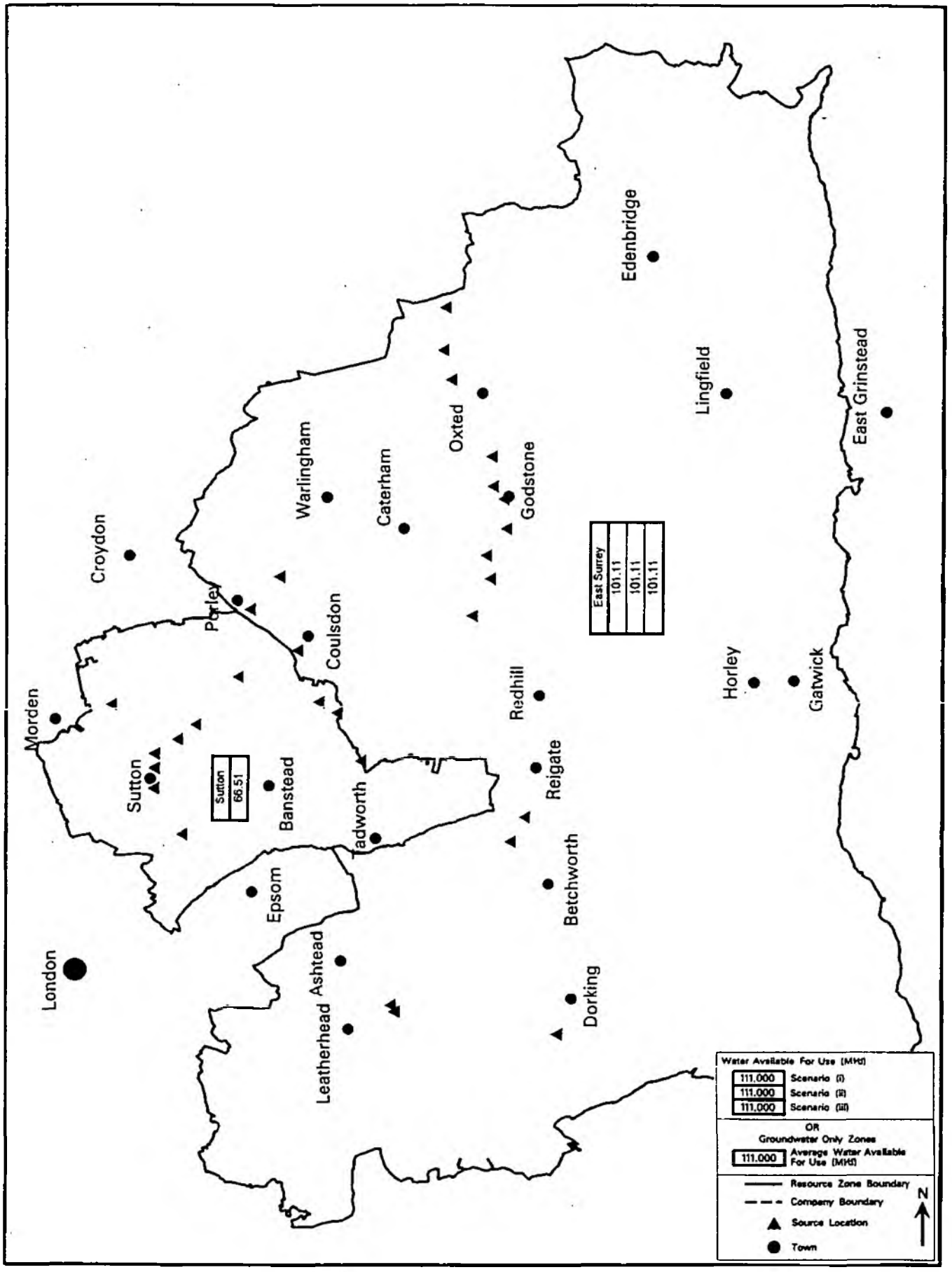
TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	72.00
	Peak Week	80.00
WATER AVAILABLE FOR USE (Ml/d)	Average	66.51
	Peak Week	74.51

NOTES

1. This is a groundwater only resource zone, so results for surface water scenarios not reported.
1. Water available for use computed as total deployable output less outage, less water unavailable

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	207.00 Ml/d	
TOTAL DEPLOYABLE OUTPUT	204.88 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-2.12 Ml/d	-1 %
1997 WATER AVAILABLE FOR USE	167.62 Ml/d	



Thames Region

SUTTON & EAST SURREY WATER SUPPLY AREA

Thames Water Utilities Ltd

The Company supplies a major part of Greater London, parts of Surrey, Berkshire, Buckinghamshire, Gloucestershire, Kent, Oxfordshire and Wiltshire.

The company has identified 10 resource zones with the following resource characteristics:

London Supply Area:		
Thames Valley SE London Lee Valley	-	conjunctive use of surface water abstraction and reservoir storage in the Thames & Lee Valleys, with local groundwater and the North London Artificial Recharge Scheme.
Provinces:		
Guildford	-	surface and groundwater sources
Henley	-	groundwater
Kennet Valley	-	largely groundwater, except in Reading which includes abstraction from the River Kennet
N Oxfordshire	-	conjunctive use of Farmoor reservoir and abstraction from the Thames, Worsham, Cherwell and Sor Brook
S Oxfordshire	-	groundwater
Swindon	-	groundwater with strategic transfers from Farmoor
Slough, Wycombe & Aylesbury	-	groundwater

Key points

- London Resource System: the Company has significantly reduced the estimated resource value reflecting operational constraints and the impact of other abstractors upstream taking up to their full licensed quantity. The estimate of deployable output will require further assessment jointly by the Agency and the Company to ensure that it adequately reflects actual operations over recent drought periods which have achieved a significantly higher output.

- The impact of different levels of service are significant in the major resource zones of the Upper and Lower Thames; the alternative scenarios generally resulting in a lower deployable output.

- Fobney (Kennet Resource Zone): the Company has reduced the estimated deployable output from the licence quantity due to concerns regarding river management and flows in the Lower Kennet during 1997.

- Shalford (Guildford Zone): depoyable yield has been reduced due to treatment constraints (see below).

- A range of sourceworks and rehabilitation improvements have been identified by the company which could significantly improve the deployable outputs reported. Some, such as Shalford (Guildford Zone) are scheduled to be progressed during 1998.

- The Company reports 29 licensed sources with zero deployable output, 24 of which have

not been utilised for a number of years. New works at a number of these sources should raise the deployable output towards the licensed quantities. The Agency will need to assess the need for the remainder of these sources to be licensed.

THAMES WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
GUILDFORD	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
Shalford				16.30					
Groundwater Sources									
Blackheath Lane					0.00	0.00			
Brook					2.30	2.30			
Cotterells Farm					2.30	2.30			
Dapdune					10.00	12.00			
Ladymead					7.00	13.00			
Millmead					3.50	4.50			
Mousehill & Rodborough					5.50	6.60			
Netley Mill					4.60	5.70			
Shere Heath					2.20	2.20			
Sturt Road					1.70	1.70			
Imports and Exports									
Supply to North Surrey Water Ltd									
Import from Mid Southern Water									
RESOURCE ZONE TOTAL				16.30	39.10	50.50	5.00	50.40	61.80

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	55.40
	Peak Week	66.80
WATER AVAILABLE FOR USE (Ml/d)	Average	50.40
	Peak Week	61.80

NOTES

1. Resource zone predominantly groundwater based, with one surface water source at Shalford
2. Deployable output of Shalford source limited by current treatment capacity. Capital works in progress to provide capability to treat 30Ml/d abstraction by August 1998.

THAMES WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
HENLEY	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Greys Road					3.60	3.60			
Harpsden					4.20	4.20			
Sheeplands					12.00	12.00			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					19.80	19.80	0.20	19.60	19.60

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	19.80	
	Peak Week	19.80	
WATER AVAILABLE FOR USE (Ml/d)	Average	19.60	
	Peak Week	19.60	

NOTES

1. This is a groundwater only resource zone, so results for surface water scenarios not reported.

THAMES WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
KENNET VALLEY	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Reservoirs				
None				
Run of River Schemes				
Fobney				39.60
Groundwater Sources				
Arborfield				
Bishops Green				
Bradfield Valley & Bradfield Windmill				
Cold Ash				
East Woodhay				
Fognam Down				
Hungerford				
Mortimer				
Pangbourne				
Playhatch				
Shalbourne				
Speen				
Theale				
Ufton Nervet				
Imports and Exports				
Imports from Southern Water				8.70
RESOURCE ZONE TOTAL				39.60
TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	138.30		
	Peak Week	155.50		
WATER AVAILABLE FOR USE (Ml/d)	Average	137.30		
	Peak Week	154.50		

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
Average	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
0.00	0.00			
11.00	18.20			
2.30	2.30			
0.00	0.00			
6.20	13.50			
2.70	3.20			
1.80	1.80			
4.60	4.60			
38.60	38.60			
6.50	6.50			
0.00	0.00			
11.40	13.60			
0.00	0.00			
13.60	13.60			
98.70	115.90	1.00	137.30	154.50

THAMES WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
LEE VALLEY	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
New Gauge Enfield									
Groundwater Sources									
Amwell End					3.70	3.70			
Amwell Hill					7.00	7.00			
Amwell Marsh					20.00	31.80			
Bethune Road									
Broadmead					5.20	5.20			
Broxbourne					12.70	15.50			
Bush Hill Road									
Campsbourne					0.00	0.00			
Caterhaich Lane									
Chadwell Spring					0.00	0.00			
Chingford South									
Coppermill Lane									
Damicle Hill					0.00	0.00			
Eade Road									
East Ham (E)					0.00	0.00			
Flanders Weir									
Greaves									
Green Lanes									
Hadley Road					0.00	0.00			
Hazelwood Lane									
Highfield									
Hoddesdon									
Hoe Lane North									
SUB TOTAL (See Notes)									
DEPLOYABLE OUTPUT (Ml/d) - Sub Total	Average		Not applicable. See notes and page 6 of 12						
	Peak Week		Not applicable. See notes and page 6 of 12						

NOTES

1. The lower Thames conjunctive use system provides water to the total London area which comprises three resource zones. Lee Valley to the north, Thames Valley in the west and central, and South East in the south eastern area.
2. Total deployable outputs for the Lower Thames conjunctive use scheme have been split between each area (resource zones) based on resource zone demands.
3. In general, individual deployable outputs for sources of the conjunctive use scheme have not been provided, and have therefore not been reported. Where deployable output figures were accessible, they have been entered in the tables.

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
LEE VALLEY (Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
SUB TOTAL (See Previous Page)									
Groundwater Sources									
Hoe Lane South									
Hornsey Filter Beds									
Hornsey Gatehouse									
Hornsey Sluice									
King Georges PS									
Kings Arms Bridge									
Lea Bridge Road									
Lockwood Reservoir (Blackhorse Lane)									
Lordship Road									
Lothair Road South									
Lower Hall Lane (Chingford)									
Middlefield Road					0.00	0.00			
Myddleton Road									
Oakthorpe Road									
Old Ford (Dace Rd)					0.00	0.00			
Park Well									
Ponders End East									
Ponders End West									
Rammey Marsh									
Ridge Avenue (North)									
Ridge Avenue (South)									
Rye Common					15.00	16.40			
Sewardstone Road									
Southbury Road									
Station Road									
Turkey Brook									
Tumford					11.40	11.40			
Waltham Abbey									
Wanstead					0.00	0.00			
Warwick Reservoir									
Whittington Road									
SUB TOTAL									
DEPLOYABLE OUTPUT (Ml/d) - Sub Total	Average		Not Applicable. See notes and page 6 of 12						
	Peak Week		Not Applicable. See notes and page 6 of 12						

THAMES WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
LEE VALLEY (Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
SUB TOTAL (See Previous Page)										
Imports and Exports										
Export to Essex & Suffolk Water										
RESOURCE ZONE TOTAL (See Notes)	469.00	469.00	469.00				10.00	459.00	459.00	459.00

TOTAL DEPLOYABLE OUTPUT (Ml/d)	
Scenario 1	469.00
Scenario 2	469.00
Scenario 3	469.00

Change from Scenario 3 to Scenario 1	0.00 Ml/d	0.00 %
Change from Scenario 3 to Scenario 2	0.00 Ml/d	0.00 %

NOTES

1. The lower Thames conjunctive use system provides water to the total London area which comprises three resource zones. Lee Valley to the north, Thames Valley in the west and central, and South East in the south eastern area.
2. Total deployable outputs for the Lower Thames conjunctive use scheme have been split between each area (resource zones) based on resource zone demands.
3. In general, individual deployable outputs for sources of the conjunctive use scheme have not been provided, and have therefore not been reported. Where deployable output figures were accessible, they have been entered in the tables.

THAMES WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
NORTH OXFORDSHIRE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Farmoor and Swinford										
Bodicote										
Grimsbury										
Run of River Schemes										
Culham										
Worsham										
Groundwater Sources										
Old Chalford										
Imports and Exports										
Import from South Oxfordshire Zone				40.00						
RESOURCE ZONE TOTAL	132.20	152.70	139.10	40.00			16.00	156.20	176.70	163.10

TOTAL DEPLOYABLE OUTPUT (Ml/d)	
Scenario 1	172.20
Scenario 2	192.70
Scenario 3	179.10

Change from Scenario 3 to Scenario 1	6.90 Ml/d	3.65 %
Change from Scenario 3 to Scenario 2	-13.60 Ml/d	-7.59 %

NOTES

1. The Upper Thames conjunctive use system provides water to the two resource zones - North Oxfordshire and Swindon.
2. Individual source deployable outputs have therefore not been provided and have not been reported.
3. Total deployable outputs quoted in these zones are based on the Upper Thames modelling, and the capacity of the Farmoor link main.

THAMES WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
SLOUGH/WYCOMBE/AYLESBURY	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Reservoirs				
None				
Run of River Schemes				
None				
Groundwater Sources				
Bourne End				
Burnham				
Dancers End				
Datchet				
Dorney				
Eton				
Hampden				
Hawridge				
Marlow				
Medmenham				
Mill End				
New Ground				
Pann Mill				
Radnage				
Taplow				
Wendover				
Imports and Exports				
Supply from South Oxfordshire Zone				
RESOURCE ZONE TOTAL				
TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	200.00		
	Peak Week	231.00		
WATER AVAILABLE FOR USE (Ml/d)	Average	185.00		
	Peak Week	216.00		

NOTES

1. Resource zone is groundwater based, so no surface water results reported.

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
Average	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
20.70	22.70			
0.00	0.00			
1.20	1.30			
18.20	22.70			
18.20	27.30			
8.70	8.70			
3.60	4.00			
5.70	6.30			
6.40	7.00			
41.00	50.00			
15.90	17.50			
5.90	6.50			
12.40	13.50			
1.80	2.00			
36.40	37.20			
3.90	4.30			
200.00	231.00	15.00	185.00	216.00

THAMES WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
SOUTH EAST LONDON	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
None										
Run of River Schemes										
None										
Groundwater Sources										
Bexley					31.80	35.00				
Crayford					13.60	13.60				
Darenth					20.90	22.00				
Dartford					3.60	4.10				
Deptford					32.50	32.50				
Eynsford					9.00	9.50				
Green St Green					4.40	4.40				
Horton Kirkby					8.00	13.60				
Lullingstone					6.10	9.00				
North Orpington					9.10	10.00				
Orpington					10.50	10.50				
Shortlands					16.80	20.00				
Southfleet					2.30	2.70				
Sundridge					1.30	8.00				
Wansunt					13.60	14.80				
West Wickham					7.50	7.50				
Westerham Hill					0.60	0.60				
Wilmington					19.10	20.00				
Imports and Exports										
None										
RESOURCE ZONE TOTAL (See Notes)	327.00	327.00	327.00				3.00	324.00	324.00	324.00

TOTAL DEPLOYABLE OUTPUT (Ml/d)	
Scenario 1	327.00
Scenario 2	327.00
Scenario 3	327.00

Change from Scenario 3 to Scenario 1	0.00 Ml/d	0.00 %
Change from Scenario 3 to Scenario 2	0.00 Ml/d	0.00 %

NOTES

1. The Lower Thames conjunctive use system provides water to the total London area which comprises three resource zones - Lee valley to the north, Thames valley in the west and central and South East in the south eastern area.
2. Individual source deployable outputs have therefore not been provided and have not been reported.
3. Total deployable outputs quoted in these zones are based on the Lower Thames modelling and proportional splits between each area are based on the resource zone demands.
4. Resource zone is groundwater based, so no surface water results not provided, and therefore not reported.

THAMES WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
SOUTH OXFORDSHIRE	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Reservoirs				
None				
Run of River Schemes				
None				
Groundwater Sources				
Aston Tirrold				
Blewbury				
Britwell				
Chieveley				
Childrey Warren				
Chinnor				
Cholsey				
Cleeve 3 & 4				
Cleeve 5				
Compton				
Gatehampton				
Leckhampstead				
Lewknor				
Manor Road (Wantage)				
Upton				
Watlington				
West Hagbourne				
West Hendred				
Witheridge Hill				
Woods Farm				
Imports and Exports				
Supply from Wantage to Lambome (Kennet Valley)				
Supply from Cleeve to Oxford (North Oxfordshire)				-40.00
RESOURCE ZONE TOTAL				
TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	65.25		
	Peak Week	81.85		
WATER AVAILABLE FOR USE (Ml/d)	Average	64.25		
	Peak Week	80.85		

NOTES

1. Resource zone is groundwater based, so no surface water results reported.

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
Average	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
0.00	0.00			
5.00	5.00			
1.00	1.00			
0.00	0.00			
3.70	3.70			
1.80	1.80			
0.00	0.00			
7.00	7.00			
4.30	4.30			
0.00	0.00			
70.20	85.00			
2.00	3.00			
0.25	0.25			
3.10	3.60			
0.00	0.00			
1.30	1.30			
0.00	0.00			
0.00	0.00			
2.50	2.50			
3.10	3.40			
105.25	121.85	1.00	64.25	80.85

THAMES WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
SWINDON	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
None										
Run of River Schemes										
None										
Groundwater Sources										
Ashdown Park					2.70	2.70				
Ashton Keynes					8.70	11.60				
Axford					9.30	13.10				
Baunton					6.30	6.30				
Bedwyn					1.60	1.70				
Bibury					12.30	12.30				
Blockley					0.90	0.90				
Clanford					1.30	1.50				
Dovedale					0.90	0.90				
Fairford					0.90	0.90				
Latton					28.00	28.00				
Lower Swell					0.80	0.80				
Marlborough					2.50	3.20				
Meysey Hampton					9.10	9.10				
Ogbourne					3.50	3.50				
Ramsbury					1.30	1.90				
Seven Springs					2.40	2.40				
Syreford Borehole & Spring					1.10	1.10				
Upper Swell					1.50	1.50				
Wroughton					0.00	0.00				
Imports and Exports										
Strategic Transfer from Farmoor to Faringdon										
Export /Import to Severn Trent Water										
RESOURCE ZONE TOTAL	108.50	108.50	108.50				1.00	107.50	107.50	107.50

TOTAL DEPLOYABLE OUTPUT (Ml/d)		
	Scenario 1	108.50
	Scenario 2	108.50
	Scenario 3	108.50

Change from Scenario 3 to Scenario 1	0.00 Ml/d	0.00 %
Change from Scenario 3 to Scenario 2	0.00 Ml/d	0.00 %

NOTES

1. The Upper Thames conjunctive use system provides water to the two resource zones - North Oxfordshire and Swindon.
2. Individual source deployable outputs have therefore not been provided and have not been reported.
3. Total deployable outputs quoted in these zones are based on the Upper Thames modelling, and the capacity of the Farmoor I nk main.

THAMES WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
THAMES VALLEY	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Lower Thames Sources										
Run of River Schemes										
Lower Thames Sources										
Groundwater Sources										
Addington					6.00	6.00				
Epsom Wells					10.00	10.00				
Honor Oak					0.00	0.00				
Langley Vale Well					4.10	4.10				
Merton					0.00	0.00				
Non Such					2.30	2.30				
Streatham					0.00	0.00				
Stroud Green					0.00	0.00				
Surrey St Well					16.00	16.00				
Waddon Well					7.60	10.00				
Imports and Exports										
Export to North Surrey Water				-24.00						
RESOURCE ZONE TOTAL (See Notes)	1104.00	1119.00	1154.00				15.00	1089.00	1104.00	1139.00

TOTAL DEPLOYABLE OUTPUT (Ml/d)		
	Scenario 1	1104.00
	Scenario 2	1119.00
	Scenario 3	1154.00

Change from Scenario 3 to Scenario 1	50.00 Ml/d	4.33 %
Change from Scenario 3 to Scenario 2	35.00 Ml/d	3.03 %

NOTES

1. The Lower Thames conjunctive use system provides water to the total London area which comprises three resource zones - Lee valley to the north, Thames valley in the west and central and South East in the south eastern area.
2. Individual source deployable outputs have therefore not been provided and have not been reported.
3. Total deployable outputs quoted in these zones are based on the Lower Thames modelling and proportional splits between each area are based on the resource zone demands.

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	2754.61 Ml/d	
SCENARIO 2 DEPLOYABLE OUTPUT	2694.95 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-59.66 Ml/d	-2 %
1997 WATER AVAILABLE FOR USE	2627.75 Ml/d	

Three Valleys Water

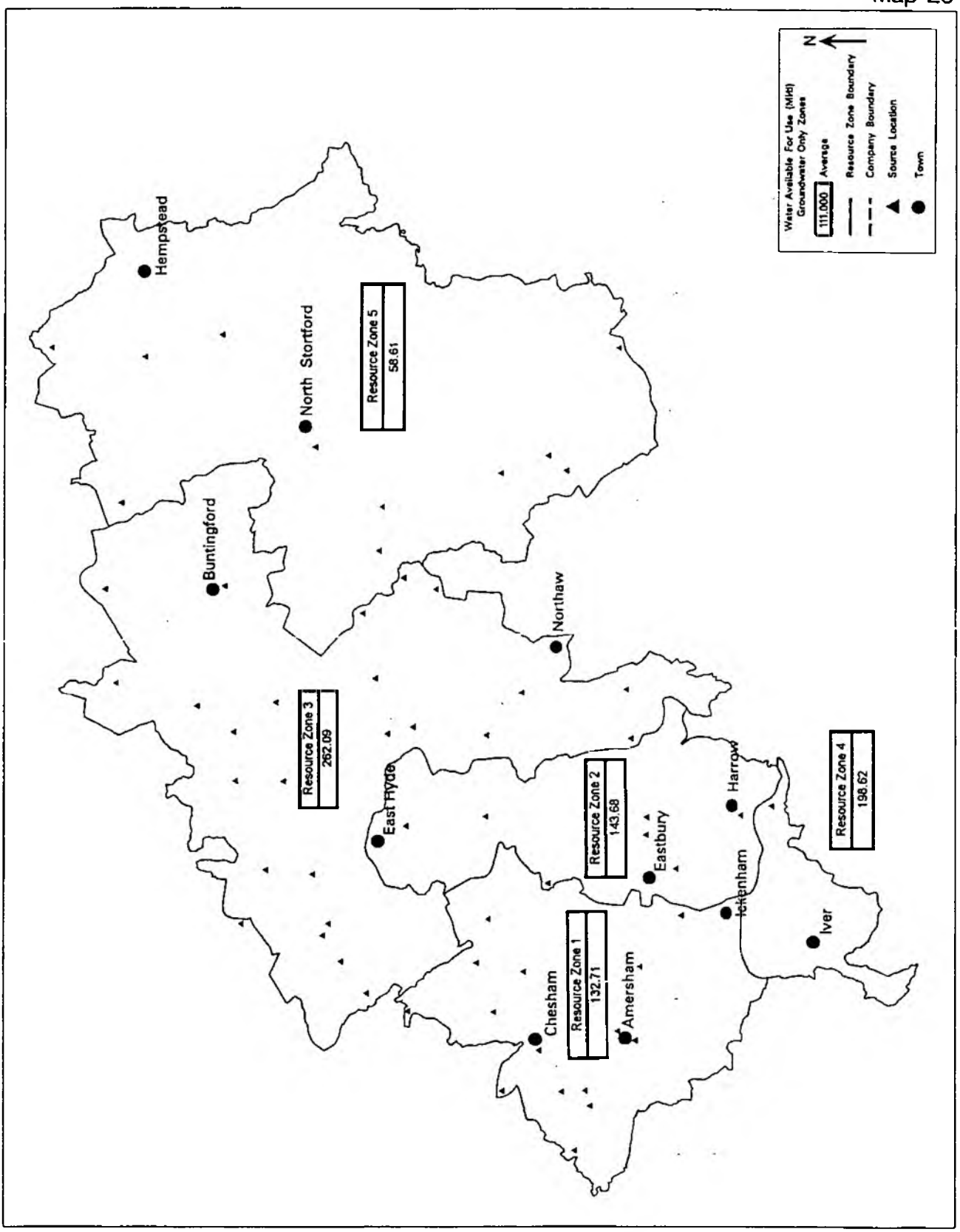
The Company supplies parts of Greater London, Essex, Bedfordshire, Buckinghamshire and Hertfordshire.

The Company has identified 5 resource zones, all but Resource Zone 4 (Iver, River Thames) being groundwater based. The Company is also reliant on a major transfer of treated water from Anglian Water's Grafham reservoir.

Key Points:

- Deployable output is approximately 94% of licensed quantity.
- Deployable output at Iver (River Thames) has now been increased to its full licensed quantity.
- Outage estimates (12.5%) reflect operational conditions experienced during 1997.
- The Company has identified a range of measures which could improve deployable output at some sources up to licence quantities. At other sources the Company has identified potential deployable outputs which may exceed current licence limits.

Map 23



Thames Region

THREE VALLEYS WATER SUPPLY AREA

THREE VALLEYS WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
ZONE 1	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		Average	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Blackford Group					80.10	101.66			
Great Missenden Group					28.02	29.20			
Little Gaddesden Group					36.06	38.15			
Hughenden					2.27	2.27			
Chesham					5.22	6.00			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					151.67	177.28	18.96	132.71	158.32

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	151.67
	Peak Week	177.28
WATER AVAILABLE FOR USE (Ml/d)	Average	132.71
	Peak Week	158.32

NOTES

1. This is a groundwater only resource zone, so results for surface water scenarios not reported.
2. Water company 'average outage figure' used to compute water available for use

THREE VALLEYS WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
ZONE 2	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Clay Lane Group					115.09	141.30			
Hyde Group					5.68	13.64			
St Albans					22.79	28.11			
Watford Group					19.15	19.15			
Bushey Hall					3.43	13.70			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					166.14	215.90	22.46	143.68	193.44

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	166.14
	Peak Week	215.90
WATER AVAILABLE FOR USE (Ml/d)	Average	143.68
	Peak Week	193.44

NOTES

1. This is a groundwater only resource zone, so results for surface water scenarios not reported.
2. Water company 'average outage figure' used to compute water available for use

THREE VALLEYS WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
ZONE 3	*Scenario 1*	*Scenario 2*	*Scenario 3*	
Reservoirs				
None				
Run of River Schemes				
None				
Groundwater Sources				
Crescent Road Group				
Digswell Group				
Hatfield Group				
Kensworth Group				
Whitehall Group				
Willian Group				
London Road & Queens Road				
Offley Bottom				
Wymondley				
North Mymms				
Musley Lane				
Motewood				
Oughton Head				
Hare Street				
Essendon				
Eagle Tavern				
Codicote				
Chipping				
Broomin Green				
Aston				
Kings Walden				
SUB TOTAL				
DEPLOYABLE OUTPUT (Ml/d) - Sub Total	Average	153.36		
	Peak Week	182.67		

NOTES

1. Water company 'Average outage figure' used to compute water available for use
2. Deployable output at Offley Bottom and Oughton Head adjusted to account for water returned to river
3. Import from Grafham based on the Great Ouse Water Act, included in Total Deployable Output

2 March 1998

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
Average	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
28.50	29.30			
12.34	15.83			
19.52	21.42			
15.85	32.29			
25.29	26.42			
14.77	15.92			
1.85	2.42			
0.00	0.00			
1.14	1.53			
8.50	8.50			
4.32	5.05			
1.81	1.81			
2.55	3.05			
1.36	1.36			
9.09	9.09			
0.00	0.00			
0.65	0.65			
2.20	3.45			
0.00	0.00			
1.82	1.82			
1.80	2.76			
153.36	182.67			

THREE VALLEYS WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)
ZONE 3 (Contd.)	*Scenario 1*	*Scenario 2*	*Scenario 3*	
SUB TOTAL (See Previous Page)				
Groundwater Sources				
School Lane				
Therfield Heath				
Wadesmill Road				
Periwinkle Lane				
Slip End				
Temple End				
Sacombe				
Runley Wood (Greensand)				
Waterhall				
Runley Wood (Chalk)				
Well Head				
PortHill				
Imports and Exports				
Strategic Supply from Grafham				91.00
RESOURCE ZONE TOTAL				

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	286.53
	Peak Week	319.36
WATER AVAILABLE FOR USE (Ml/d)	Average	262.09
	Peak Week	294.92

NOTES

1. Water company 'Average outage figure' used to compute water available for use
2. Deployable output at Slip End and Well Head adjusted to account for water returned to river

GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
Average	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
153.36	182.67			
0.00	0.00			
3.41	4.43			
5.90	5.90			
4.99	5.00			
0.00	0.00			
4.54	5.68			
13.64	13.64			
0.00	0.00			
1.09	1.36			
6.00	6.25			
0.45	1.27			
2.15	2.16			
195.53	228.36	24.44	262.09	294.92

THREE VALLEYS WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)
ZONE 4	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		
Reservoirs								
None								
Run of River Schemes								
River Thames - Iver				227.00				
Groundwater Sources								
None								
Imports and Exports								
None								
RESOURCE ZONE TOTAL				227.00			28.38	198.62

TOTAL DEPLOYABLE OUTPUT (Ml/d)	227.00
WATER AVAILABLE FOR USE (Ml/d)	198.62

NOTES

1. Resource zone based on surface water abstraction source from the River Thames.
2. Water company 'Average outage figure' used to compute water available for use

THREE VALLEYS WATER

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
ZONE 5	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Hadham Group					10.94	10.94			
Stortford Group					9.09	11.25			
Uttlesford Group					6.82	6.84			
Thaxted					1.25	1.64			
Causeway					3.60	3.60			
Wenden					2.00	2.75			
Debden Road					2.25	2.25			
Dunmow					0.00	0.00			
Newport					1.38	2.27			
Standon					4.55	5.91			
Hempstead					1.70	2.40			
Amwage Bridge					1.59	1.24			
Roydon					13.40	15.40			
Redricks Lane					5.70	6.82			
Stansted Nr 1					2.73	2.73			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					66.98	76.04	9.51 (Peak outage) 8.37	58.61	67.67

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Average	66.98
	Peak Week	76.04
WATER AVAILABLE FOR USE (Ml/d)	Average	58.61
	Peak Week	67.67

NOTES

1. Water company 'Average outage figure' used to compute water available for use
2. Deployable output from Debden Road reduced to allow for treatment losses

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	896.44 Ml/d	
AVERAGE DEPLOYABLE OUTPUT	898.32 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	1.88 Ml/d	<1 %
1997 WATER AVAILABLE FOR USE	795.71 Ml/d	

WELSH REGION

Map AQ8

AQUIFER SUSTAINABILITY - Welsh Region

Dŵr Cymru/Welsh Water

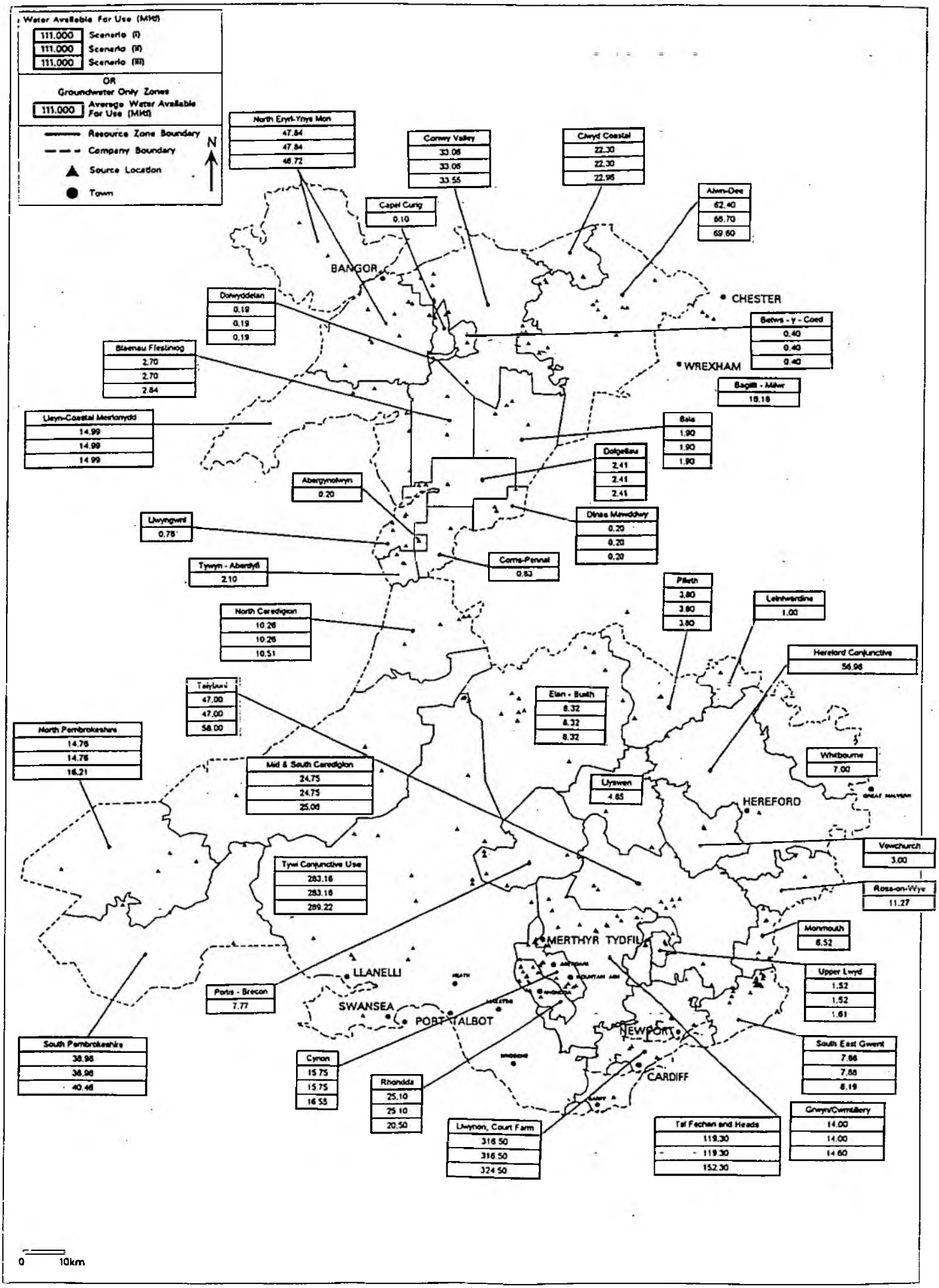
Dŵr Cymru supplies most of the Principality with the exception of some parts of rural mid - Wales and the Wrexham area. The main sources are upland reservoirs and river abstractions, many of which are supported by releases from regulation reservoirs. Groundwater is locally important. The Company operates across three Divisions. Company policy is for no restrictions, so Scenarios 1 and 2 are the same, except for those zones reliant upon the River Dee where the Agency has proposed Scenario 2 reductions.

Northern Division : a series of discrete upland reservoirs in Gwynedd have largely similar yields under the revised methodology compared with previous estimates. However, outputs for Anglesey are reduced for reasons which will require further investigation. In the East of the Division yields are little changed.

South West Division : this Division is dominated by abstractions from the River Tywi, supported by releases from Llyn Brianne. Scenario1 suggests a yield reduction of 20% for the Division, with Scenario 3 giving an 18% reduction. The reasons for this are being evaluated.

South East Division : with the exception of some small sources, which are little changed by the revised methodology, most of the south east is covered by one major conjunctive use system. For the Division as a whole, yields have increased by 2% for Scenarios 1 and 2, and 10% for Scenario 3.

The yield reassessment work is continuing. Within the timescale available it has not been possible for the Company to refine fully the outputs nor to optimise the models used in each of the three Divisions. The Agency is continuing to work closely with Dŵr Cymru to review all the outputs.



Welsh Region
WELSH WATER SUPPLY AREA

WELSH WATER - SOUTH WEST DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
MID AND SOUTH CEREDIGION	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Teifi Pools	7.84	7.84	8.60							
Run of River Schemes										
Llechryd	15.35	15.35	14.90							
Groundwater Sources										
Olwen Borehole					0.40	0.40				
Aeron Boreholes (EXEMPT)					0.25	1.00				
Brynberian (EXEMPT)					0.60	0.60				
Llanybydder (EXEMPT)					0.40	0.40				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	23.19	23.19	23.50	0.00	1.65	2.40	0.09	24.75	24.75	25.06

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Scenario 1	24.84		
	Scenario 2	24.84		
	Scenario 3	25.15		
	Change from Scenario 3 to Scenario 1		0.31 Ml/d	1 %
	Change from Scenario 3 to Scenario 2		0.31 Ml/d	1 %

NOTES

1. Surface sources deployable output are demand driven rather than licence limited, therefore surface water deployable outptut would increase by 0.3Ml/d.

WELSH WATER - SOUTH WEST DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
NORTH PEMBROKESHIRE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Prescely No 1 Reservoir	14.79	14.79	16.24							
Llysyfran										
Run of River Schemes										
Eastern Cleddau at Pont Hywel										
River Solva at Middle Mill										
Groundwater Sources										
None										
Imports and Exports										
None										
RESOURCE ZONE TOTAL	14.79	14.79	16.24				0.03	14.76	14.76	16.21

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	14.79		
	Scenario 2	14.79		
	Scenario 3	16.24		
	Change from Scenario 3 to Scenario 1		1.45 Ml/d	10 %
	Change from Scenario 3 to Scenario 2		1.45 Ml/d	10 %

NOTES

1. Deployable outputs of the sources at Pont Hywel, Llysyfran and River Solva at Middle Mill included in the figure for Prescelly No 1 Reservoir

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
NORTH CEREDIGION	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Llyn Llygad Rheidol and Maesnant Stream	6.75	6.75	7.00							
Llyn Craig-y-Pistyll										
Run of River Schemes										
Maesnant/Nantymoch										
Groundwater Sources										
Parcel Ganol Borehole - Lovesgrove					3.56	5.00				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	6.75	6.75	7.00		3.56	5.00	0.05	10.26	10.26	10.51

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	10.31		
	Scenario 2	10.31		
	Scenario 3	10.56		
	Change from Scenario 3 to Scenario 1		0.25 Ml/d	2 %
	Change from Scenario 3 to Scenario 2		0.25 Ml/d	2 %

NOTES

1. Deployable outputs of the sources at Maesnant and NantyMoch streams; Llyn Craig-y-Pistyll included in the figure for Llyn Llygad Rheidol and Maesnant Stream source

WELSH WATER - SOUTH WEST DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
SOUTH PEMBROKESHIRE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Llysyfran Reservoir at Canaston Bridge Intake	35.01	35.01	36.49							
Run of River Schemes										
W. Cleddau at Crowhill										
Groundwater Sources										
Valley Court										
Pendine Borehole					4.32	6.05				
Milton Boreholes										
Park Springs										
Imports and Exports										
None										
RESOURCE ZONE TOTAL	35.01	35.01	36.49		4.32	6.05	0.35	38.98	38.98	40.46

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	39.33		
	Scenario 2	39.33		
	Scenario 3	40.81		
	Change from Scenario 3 to Scenario 1		1.48 Ml/d	4 %
	Change from Scenario 3 to Scenario 2		1.48 Ml/d	4 %

NOTES

1. Deployable outputs of the sources at Valley Court, Milton, Park Springs and Western Cleddau at Crowhill have been included in the figure for Llyn Llysyfran Reservoir at Canaton Bridge Intake.

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
TYWI CONJUNCTIVE USE ZONE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Upper&Lower Lliw										
Usk	36.04	36.04	36.04							
Crai	22.75	22.75	28.31							
Ystradfellte	14.94	14.94	15.23							
Run of River Schemes										
Tywi at Nantgaredig	210.00	210.00	210.00							
Tywi at Manorafon										
Llygad Llwchwr	5.03	5.03	5.24							
Parkmill Gower										
Groundwater Sources										
Schwyll Well					21.80	30.00				
Tonn Borehole and Cynnant Springs					0.67	0.67				
Imports and Exports										
Export to Southern Conjunctive Use Area				-5.70						
RESOURCE ZONE TOTAL	288.76	288.76	294.82	-5.70	0.67	0.67	0.57	283.16	283.16	289.22

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	283.73		
	Scenario 2	283.73		
	Scenario 3	289.79		
	Change from Scenario 3 to Scenario 1		6.06 Ml/d	2 %
	Change from Scenario 3 to Scenario 2		6.06 Ml/d	2 %

NOTES

1. Deployable output of Lliw Reservoirs, Springs at Hotywell, Pitton and Parkmill included in figure for Tywi at Nantgaredig
2. Deployable output of Tywi - Manorafon abstraction source included in figure for Usk Reservoir
3. Schwyll Well not currently used, and therefore not included in total deployable output
4. Total deployable output and water available for use based on conjunctive use modelling. Therefore individual deployable output of listed sources may not aggregate to the total deployable output figures.

WELSH WATER - NORTHERN DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
ABERGYNOLWYN	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
Abergynolwyn Spring					0.20				
Llanerch Goedlog					0.00				
Groundwater Sources									
None									
Imports and Exports									
None									
RESOURCE ZONE TOTAL					0.20		0.00	0.20	0.20

TOTAL DEPLOYABLE OUTPUT	Average	0.20 Ml/d
	Peak Week	
WATER AVAILABLE FOR USE (Ml/d)	Average	0.20 Ml/d
	Peak Week	

NOTES

1. Peak week deployable output figures not submitted, and were therefore not reported.

WELSH WATER - NORTHERN DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
ALWEN - DEE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Alwen	62.40	66.70	69.60							
Cilcain										
Run of River Schemes										
Dee (Poulton)										
Groundwater Sources										
Bretton Boreholes					1.00	6.50				
Plas yr Esgob										
Efailnewydd										
Llwyn Isaf										
Imports and Exports										
None										
RESOURCE ZONE TOTAL	62.40	66.70	69.60				0.00	62.40	66.70	69.60

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	62.40		
	Scenario 2	66.70		
	Scenario 3	69.60		
	Change from Scenario 3 to Scenario 1		7.20 Ml/d	12 %
	Change from Scenario 3 to Scenario 2		2.90 Ml/d	4 %

NOTES

1.Deployable output of groundwater sources included in resource zone totals.

2. Cilcain, Dee (Poulton), Plas yr Esgob, Efailnewydd, Llwyn Isaf are all included in the deployable output from the Alwen Reservoir.

WELSH WATER - NORTHERN DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)
BAGILLT-MILWR	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		
Reservoirs								
None								
Run of River Schemes								
Bagillt, Milwr				18.18				
Groundwater Sources								
None								
Imports and Exports								
None								
RESOURCE ZONE TOTAL				18.18			0.00	18.18

TOTAL DEPLOYABLE OUTPUT (Ml/d) 18.18 Ml/d

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
BALA	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Llyn Arenig Fawr	1.90	1.90	1.90							
Run of River Schemes										
None										
Groundwater Sources										
None										
Imports and Exports										
None										
RESOURCE ZONE TOTAL	1.90	1.90	1.90				0.00	1.90	1.90	1.90

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	1.90		
	Scenario 2	1.90		
	Scenario 3	1.90		
	Change from Scenario 3 to Scenario 1		0.00 Ml/d	0 %
	Change from Scenario 3 to Scenario 2		0.00 Ml/d	0 %

WELSH WATER - NORTHERN DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION		SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
BETWS-Y-COED		*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs											
	Llyn Elsi	0.40	0.40	0.40							
Run of River Schemes											
	None										
Groundwater Sources											
	None										
Imports and Exports											
	None										
RESOURCE ZONE TOTAL		0.40	0.40	0.40				0.00	0.40	0.40	0.40

TOTAL DEPLOYABLE OUTPUT (Ml/d)	Scenario 1	0.40	
	Scenario 2	0.40	
	Scenario 3	0.40	
	Change from Scenario 3 to Scenario 1	0.00 Ml/d	0 %
	Change from Scenario 3 to Scenario 2	0.00 Ml/d	0 %

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
BLAENAU FFESTINIOG	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Llyn Morwynion	2.70	2.70	2.84							
Run of River Schemes										
Afon Garn										
Groundwater Sources										
None										
Imports and Exports										
None										
RESOURCE ZONE TOTAL	2.70	2.70	2.84				0.00	2.70	2.70	2.84

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	2.70		
	Scenario 2	2.70		
	Scenario 3	2.84		
	Change from Scenario 3 to Scenario 1		0.14 Ml/d	5 %
	Change from Scenario 3 to Scenario 2		0.14 Ml/d	5 %

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)
CAPEL CURIG	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		
Reservoirs								
None								
Run of River Schemes								
Afon-y-Bedol				0.10				
Groundwater Sources								
None								
Imports and Exports								
None								
RESOURCE ZONE TOTAL				0.10			0.00	0.10

TOTAL DEPLOYABLE OUTPUT 0.10 Ml/d

RESOURCE ZONE/SOURCE DESCRIPTION		SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
CONWY VALLEY		*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs											
	Llyn Cowlyd	33.06	33.06	33.55							
	Llyn Conwy										
	Llyn Anafon										
Run of River Schemes											
	None										
Groundwater Sources											
	None										
Imports and Exports											
	None										
RESOURCE ZONE TOTAL		33.06	33.06	33.55				0.00	33.06	33.06	33.55

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	33.06		
	Scenario 2	33.06		
	Scenario 3	33.55		
	Change from Scenario 3 to Scenario 1		0.49 Ml/d	1 %
	Change from Scenario 3 to Scenario 2		0.49 Ml/d	1 %

NOTES

1.Deployable outputs of Llyn Conwy and Llyn Anafon sources included in the resource zone total deployable output.

WELSH WATER - NORTHERN DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)
CORRIS-PENNAL	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		
Reservoirs								
None								
Run of River Schemes								
None								
Groundwater Sources								
None								
Imports and Exports								
Import from Severn Trent Water				0.83				
RESOURCE ZONE TOTAL				0.83			0.00	0.83

TOTAL DEPLOYABLE OUTPUT 0.83 Ml/d

WELSH WATER - NORTHERN DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
CLWYD COASTAL	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Llyn Aled										
Aled Isaf										
Plas Uchaf										
Bryn Aled	3.99	3.99	4.65							
Run of River Schemes										
None										
Groundwater Sources										
Llannerch Park Borehole					9.34	12.53				
Vale of Clywd Boreholes					8.97	15.50				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	3.99	3.99	4.65		18.31	28.03	0.00	22.30	22.30	22.96

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	22.30		
	Scenario 2	22.30		
	Scenario 3	22.96		
	Change from Scenario 3 to Scenario 1		0.66 Ml/d	3 %
	Change from Scenario 3 to Scenario 2		0.66 Ml/d	3 %

NOTES:

1. Llyn Aled, Aled Isaf and Plas Uchaf are all included in the resource zone total.

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
DOLGELLAU	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Llyn Cynwch	1.95	1.95	1.95							
Run of River Schemes										
Afon Whion										
Afon Cwm Mynach				0.01						
Afon Cwm Llechen				0.45						
Groundwater Sources										
None										
Imports and Exports										
None										
RESOURCE ZONE TOTAL	1.95	1.95	1.95	0.46			0.00	2.41	2.41	2.41

TOTAL DEPLOYABLE OUTPUT (Ml/d)		
	Scenario 1	2.41
	Scenario 2	2.41
	Scenario 3	2.41

Change from Scenario 3 to Scenario 1	0.00 Ml/d	0 %
Change from Scenario 3 to Scenario 2	0.00 Ml/d	0 %

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
DOLWYDDELAN	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Ceunant y Garnedd	0.19	0.19	0.19							
Run of River Schemes										
None										
Groundwater Sources										
None										
Imports and Exports										
None										
RESOURCE ZONE TOTAL	0.19	0.19	0.19				0.00	0.19	0.19	0.19

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	0.19		
	Scenario 2	0.19		
	Scenario 3	0.19		
	Change from Scenario 3 to Scenario 1		0.00 Ml/d	0 %
	Change from Scenario 3 to Scenario 2		0.00 Ml/d	0 %

WELSH WATER - NORTHERN DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
DINAS MAWDDWY	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
None										
Run of River Schemes										
Springs at Brynllys, and Nant Mintlyn	0.20	0.20	0.20							
Bryn Llanymawddwy Spring										
Afon Dyfi										
Groundwater Sources										
None										
Imports and Exports										
None										
RESOURCE ZONE TOTAL	0.20	0.20	0.20				0.00	0.20	0.20	0.20

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	0.20		
	Scenario 2	0.20		
	Scenario 3	0.20		
	Change from Scenario 3 to Scenario 1		0.00 Ml/d	0 %
	Change from Scenario 3 to Scenario 2		0.00 Ml/d	0 %

NOTES

1. The deployable outputs of Bryn Llanymawddwy Spring and Afon Dyfi are included in the resource zone's total deployable output.

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
LLEYN-COASTAL MEIRIONYDD	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Tallin Stream Llyn Tecwyn Uchaf	14.99	14.99	14.99							
Llyn Cwmystradllyn										
Llyn Eiddew Mawr										
Llyn Bodlyn										
Run of River Schemes										
Afon Dwyfor										
Groundwater Sources										
None										
Imports and Exports										
None										
RESOURCE ZONE TOTAL	14.99	14.99	14.99				0.00	14.99	14.99	14.99

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	14.99		
	Scenario 2	14.99		
	Scenario 3	14.99		
	Change from Scenario 3 to Scenario 1		0.00 Ml/d	0 %
	Change from Scenario 3 to Scenario 2		0.00 Ml/d	0 %

NOTES

1. Deployable outputs of the sources at Llyn Cymystradllyn, Llyn Eiddew Mawr and Llyn Bodlyn are included in the resource zone total.

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)
LLWYNGWRIL	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		
Reservoirs								
None								
Run of River Schemes								
Afon Caletwr, Pigyrallt and Perthygwyddwch				0.12				
Afon Gwril				0.66				
Groundwater Sources								
None								
Imports and Exports								
None								
RESOURCE ZONE TOTAL				0.78			0.00	0.78
TOTAL DEPLOYABLE OUTPUT	0.78 Ml/d							

WELSH WATER - NORTHERN DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
NORTH ERYRI-YNYS MON	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Llyn Cwm Dulyn	47.84	47.84	48.72							
Llyn Cwellyn										
Llyn Marchlyn Bach										
Ffynnon Llugwy										
Llyn Cefni										
Llyn Alaw										
Run of River Schemes										
None										
Groundwater Sources										
None										
Imports and Exports										
None										
RESOURCE ZONE TOTAL	47.84	47.84	48.72				0.00	47.84	47.84	48.72

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	47.84		
	Scenario 2	47.84		
	Scenario 3	48.72		
	Change from Scenario 3 to Scenario 1		0.88 Ml/d	2 %
	Change from Scenario 3 to Scenario 2		0.88 Ml/d	2 %

NOTES

1.Individual source deployable outputs not provided, and were therefore not reported.

WELSH WATER - NORTHERN DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)
TYWYN-ABERDYFI	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		
Reservoirs								
None								
Run of River Schemes								
Afon Fathew				2.10				
Nant Braich y Rhiw				0.00				
Groundwater Sources								
None								
Imports and Exports								
None								
RESOURCE ZONE TOTAL				2.10			0.00	2.10
TOTAL DEPLOYABLE OUTPUT	2.10 Ml/d							

WELSH WATER - SOUTH EAST DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
CYNON	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Penderyn inc Nant Bwlfa and Nant Bodwigiad										
Nant Moel										
Nant Hir										
River Dare to Bwlfa Reservoir	4.90	4.90	5.50							
Clydach & Perthcelyn										
Nant Clydach to Perthcelyn Reservoir	4.20	4.20	4.30							
Penderyn System	2.60	2.60	2.70							
Run of River Schemes										
Included with Reservoir Systems										
Groundwater Sources										
Pontbrenllwyd					4.05	4.05				
Imports and Exports										
None										
RESOURCE ZONE TOTAL	11.70	11.70	12.50		4.05	4.05	0.00	15.75	15.75	16.55

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	15.75		
	Scenario 2	15.75		
	Scenario 3	16.55		
	Change from Scenario 3 to Scenario 1		0.80 Ml/d	5 %
	Change from Scenario 3 to Scenario 2		0.80 Ml/d	5 %

NOTES

1.Bodwigiad and Nant y Bwlfa, Nantymoel Reservoir, Clydach & Perthcelyn and Nant Cwmnanthir Reservoir sources included in the figure for Penderyn

WELSH WATER - SOUTH EAST DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
ELAN - BUILTH	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Elan Reservoirs	324.80	324.80	324.80							
Run of River Schemes										
River Wye at Builth				3.50						
Groundwater Sources										
Llanbister Spring					0.01	0.01				
Llanbadam Fynydd Spring					0.01	0.01				
Llaithddu Spring					0.00	0.00				
Imports and Exports										
Export to Severn Trent Water Ltd	-320.00	-320.00	-320.00							
RESOURCE ZONE TOTAL	4.80	4.80	4.80	3.50	0.02	0.02	0.00	8.32	8.32	8.32

TOTAL DEPLOYABLE OUTPUT (Ml/d)		
	Scenario 1	8.32
	Scenario 2	8.32
	Scenario 3	8.32

Change from Scenario 3 to Scenario 1	0.00 Ml/d	0 %
Change from Scenario 3 to Scenario 2	0.00 Ml/d	0 %

NOTES

1.Total deployable output and Water availabe for use excludes export to Severn Trent Water

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
GRWYNE/CWMTILLERY	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Grwyne Fawr Reservoir and Grwyne Springs	5.50	5.50	5.70							
Cwmtillery	8.50	8.50	8.90							
Run of River Schemes										
None										
Groundwater Sources										
None										
Imports and Exports										
None										
RESOURCE ZONE TOTAL	14.00	14.00	14.60				0.00	14.00	14.00	14.60

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	14.00		
	Scenario 2	14.00		
	Scenario 3	14.60		
	Change from Scenario 3 to Scenario 1		0.60 Ml/d	4 %
	Change from Scenario 3 to Scenario 2		0.60 Ml/d	4 %

WELSH WATER - SOUTH EAST DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
HEREFORD CONJUNCTIVE USE	*Scenario 1*	*Scenario 2*	*Scenario 3*		Average	Average *Day Peak* *Week*		Average	Average *Day Peak* *Week*
Reservoirs									
None									
Run of River Schemes									
River Wye at Broomy Hill				50.44					
River Lugg at Byton				1.10					
Groundwater Sources									
Dunfield boreholes (Kington)					3.32	3.32			
Midsummer Meadow (Leominster)					2.12	2.26			
Imports and Exports									
None									
RESOURCE ZONE TOTAL				51.54	5.44	5.58	0.00	56.98	57.12

TOTAL DEPLOYABLE OUTPUT	Average	56.98 Ml/d
	Peak Week	57.12 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	56.98 Ml/d
	Peak Week	57.12 Ml/d

RESOURCE ZONE/SOURCE DESCRIPTION		SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)
LLYSWEN		*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		
Reservoirs									
	None								
Run of River Schemes									
	Llyswen				4.85				
Groundwater Sources									
	None								
Imports and Exports									
	None								
RESOURCE ZONE TOTAL					4.85			0.00	4.85

TOTAL DEPLOYABLE OUTPUT 4.85 Ml/d

WELSH WATER - SOUTH EAST DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
LLWYNON, COURT FARM, SLUVAD	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Llwynon	48.00	48.00	63.00							
River Usk at Llantrisant	51.00	51.00	60.00							
River Usk at Rhadyr	93.00	93.00	77.00							
Run of River Schemes										
River Wye at Monmouth (Wye PS)				125.00						
Groundwater Sources										
None										
Imports and Exports										
None										
RESOURCE ZONE TOTAL	192.00	192.00	200.00	125.00			0.50	316.50	316.50	324.50

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	317.00		
	Scenario 2	317.00		
	Scenario 3	325.00		
	Change from Scenario 3 to Scenario 1		8.00 Ml/d	3 %
	Change from Scenario 3 to Scenario 2		8.00 Ml/d	3 %

WELSH WATER - SOUTH EAST DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)
MONMOUTH	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		
Reservoirs								
None								
Run of River Schemes								
River Wye at Monmouth, Mayhill				5.82				
Groundwater Sources								
Buckholt					0.70	0.70		
Ffynnon Gaer					0.30	0.30		
Imports and Exports								
None								
RESOURCE ZONE TOTAL				5.82	0.70	0.70	0.00	6.52

TOTAL DEPLOYABLE OUTPUT (Ml/d) 6.52 Ml/d

NOTES

1. River Wye at Monmouth Mayhill and Ffynnon Gaer licences are linked with a combined abstraction not to exceed 6Ml/d, so entry for Ffynnon Gaer not included in total.

WELSH WATER - SOUTH EAST DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION		SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
PILLETH		*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs											
	None										
Run of River Schemes											
	None										
Groundwater Sources											
	Pilleth					3.80	3.80				
Imports and Exports											
	None										
RESOURCE ZONE TOTAL						3.80	3.80	0.00	3.80	3.80	3.80

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	3.80		
	Scenario 2	3.80		
	Scenario 3	3.80		
	Change from Scenario 3 to Scenario 1		0.00 Ml/d	0 %
	Change from Scenario 3 to Scenario 2		0.00 Ml/d	0 %

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
PORTIS - BRECON	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
Afon Trinant				0.00					
Groundwater Sources									
Brecon Boreholes					5.77	5.77			
Imports and Exports									
Import from Usk Reservoir				2.00					
RESOURCE ZONE TOTAL				2.00	5.77	5.77	0.00	7.77	7.77

TOTAL DEPLOYABLE OUTPUT	Average	7.77 Ml/d
	Peak Week	7.77 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	7.77 Ml/d
	Peak Week	7.77 Ml/d

WELSH WATER - SOUTH EAST DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
RHONDDA	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Lluest Wen & Castell Nos	11.50	11.50	6.90							
Llyn Fawr, Nant Melyn, Carnfoesen	8.00	8.00	8.00							
Nant Ystrad Ffernol										
Run of River Schemes										
Nant Cwmparc & Nant Cesig				5.60						
Groundwater Sources										
None										
Imports and Exports										
None										
RESOURCE ZONE TOTAL	19.50	19.50	14.90	5.60			0.00	25.10	25.10	20.50

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	25.10		
	Scenario 2	25.10		
	Scenario 3	20.50		
	Change from Scenario 3 to Scenario 1		-4.60 Ml/d	-18 %
	Change from Scenario 3 to Scenario 2		-4.60 Ml/d	-18 %

NOTES:

1. The deployable output of the source at Nant Ystrad Ffernol is included in the total of Lluest Wen & Castell Nos reservoir source.

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)
ROSS-ON-WYE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		
Reservoirs								
None								
Run of River Schemes								
River Wye Lydbrook								
Groundwater Sources								
Alton Court					2.27	2.27		
Imports and Exports								
9 Ml/d Bulk Transfer from Severn Trent Water via Lydbrook/Mitcheldean WTW				9.00				
RESOURCE ZONE TOTAL				9.00	2.27	2.27	0.00	11.27

TOTAL DEPLOYABLE OUTPUT (Ml/d) 11.27 Ml/d

WELSH WATER - SOUTH EAST DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION		SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
SOUTH EAST GWENT		*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs											
	Wentwood Reservoir	4.89	4.89	5.20							
	Lower Lodge Stream										
Run of River Schemes											
	Mounton Brook										
	Anguldy Brook				3.00						
Groundwater Sources											
	Rogerstone Grange					0.29	0.55				
Imports and Exports											
	None										
RESOURCE ZONE TOTAL		4.89	4.89	5.20	3.00	0.29	0.55	0.30	7.88	7.88	8.19

TOTAL DEPLOYABLE OUTPUT (Ml/d)		
	Scenario 1	8.18
	Scenario 2	8.18
	Scenario 3	8.49
	Change from Scenario 3 to Scenario 1	0.31 Ml/d 4 %
	Change from Scenario 3 to Scenario 2	0.31 Ml/d 4 %

NOTES

1. Blackbird Stream and Lower Lodge Stream deployable output included in the figure for Wentwood reservoir.
2. Mounton Brook and Tributaries deployable output included in resource zone total.
3. Rogerstone Grange deployable output included in the Anguldy & Mounton Brook total.

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
TAF FECHAN AND HEADS OF VALLEY	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Pontsticill	50.00	50.00	79.00							
Neuadd	12.00	12.00	12.00							
Taf Fawr Reservoirs - Cantref	25.00	25.00	25.00							
Shon Sheffrey & Rhymney Bridge	19.00	19.00	23.00							
Upper and Lower Camo	7.00	7.00	7.00							
Ffynnon Gisfaen Springs										
Run of River Schemes										
None										
Groundwater Sources										
Ffynnon Gisfaen					0.60	0.60				
Imports and Exports										
South West Division Transfer				5.70						
RESOURCE ZONE TOTAL	113.00	113.00	146.00	5.70	0.60	0.60	0.00	119.30	119.30	152.30

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	119.30		
	Scenario 2	119.30		
	Scenario 3	152.30		
	Change from Scenario 3 to Scenario 1		33.00 Ml/d	28 %
	Change from Scenario 3 to Scenario 2		33.00 Ml/d	28 %

NOTES

1. Ffynnon Gisfaen deployable output constrained to 3Ml/d by conjunctive use model.

WELSH WATER - SOUTH EAST DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
TALYBONT	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Talybont reservoir	47.00	47.00	58.00							
Run of River Schemes										
None										
Groundwater Sources										
None										
Imports and Exports										
None										
RESOURCE ZONE TOTAL	47.00	47.00	58.00				0.00	47.00	47.00	58.00

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	47.00		
	Scenario 2	47.00		
	Scenario 3	58.00		
	Change from Scenario 3 to Scenario 1		11.00 Ml/d	23 %
	Change from Scenario 3 to Scenario 2		11.00 Ml/d	23 %

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
UPPER LWYD	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Cwmavon Reservoir										
Nantymailor and Various Points	1.52	1.52	1.61							
Run of River Schemes										
None										
Groundwater Sources										
None										
Imports and Exports										
None										
RESOURCE ZONE TOTAL	1.52	1.52	1.61				0.00	1.52	1.52	1.61

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	1.52		
	Scenario 2	1.52		
	Scenario 3	1.61		
	Change from Scenario 3 to Scenario 1		0.09 Ml/d	6 %
	Change from Scenario 3 to Scenario 2		0.09 Ml/d	6 %

NOTES:

1. Deployable output for source at Cwmavon Reservoir is included in resource zone's total.

WELSH WATER - SOUTH EAST DIVISION

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
VOWCHURCH	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Vowchurch					3.00	3.00			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					3.00	3.00	0.00	3.00	3.00

TOTAL DEPLOYABLE OUTPUT	Average	3.00 Ml/d
	Peak Week	3.00 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	3.00 Ml/d
	Peak Week	3.00 Ml/d

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)
WHITBOURNE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		
Reservoirs								
None								
Run of River Schemes								
River Teme, Whitbourne WTW				7.00				
Groundwater Sources								
None								
Imports and Exports								
None								
RESOURCE ZONE TOTAL				7.00			0.00	7.00

TOTAL DEPLOYABLE OUTPUT 7.00 Ml/d

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)	
LEINTWARDINE	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Average*	*Average Day Peak Week*
Reservoirs									
None									
Run of River Schemes									
None									
Groundwater Sources									
Leintwardine					1.00	1.00			
Imports and Exports									
None									
RESOURCE ZONE TOTAL					1.00	1.00	0.00	1.00	1.00

TOTAL DEPLOYABLE OUTPUT	Average	1.00 Ml/d
	Peak Week	1.00 Ml/d
WATER AVAILABLE FOR USE (Ml/d)	Average	1.00 Ml/d
	Peak Week	1.00 Ml/d

WATER COMPANY SUMMARY

SOUTH WEST DIVISION

TOTAL DEPLOYABLE OUTPUT	
SCENARIO 1	373.00 Ml/d
SCENARIO 2	373.00 Ml/d
SCENARIO 3	382.55 Ml/d
OUTAGE	1.09 Ml/d

NORTHERN DIVISION

TOTAL DEPLOYABLE OUTPUT	
SCENARIO 1	210.58 Ml/d
SCENARIO 2	214.88 Ml/d
SCENARIO 3	219.95 Ml/d
OUTAGE	0.00 Ml/d

SOUTH EAST DIVISION

TOTAL DEPLOYABLE OUTPUT	
SCENARIO 1	658.36 Ml/d
SCENARIO 2	658.36 Ml/d
SCENARIO 3	707.56 Ml/d
OUTAGE	0.80 Ml/d

COMPANY-WIDE

PREVIOUS YIELD ESTIMATES	1312.46 Ml/d
SCENARIO 2 DEPLOYABLE OUTPUT	1246.24 Ml/d
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-66.22 Ml/d
1997 WATER AVAILABLE FOR USE	1244.35 Ml/d

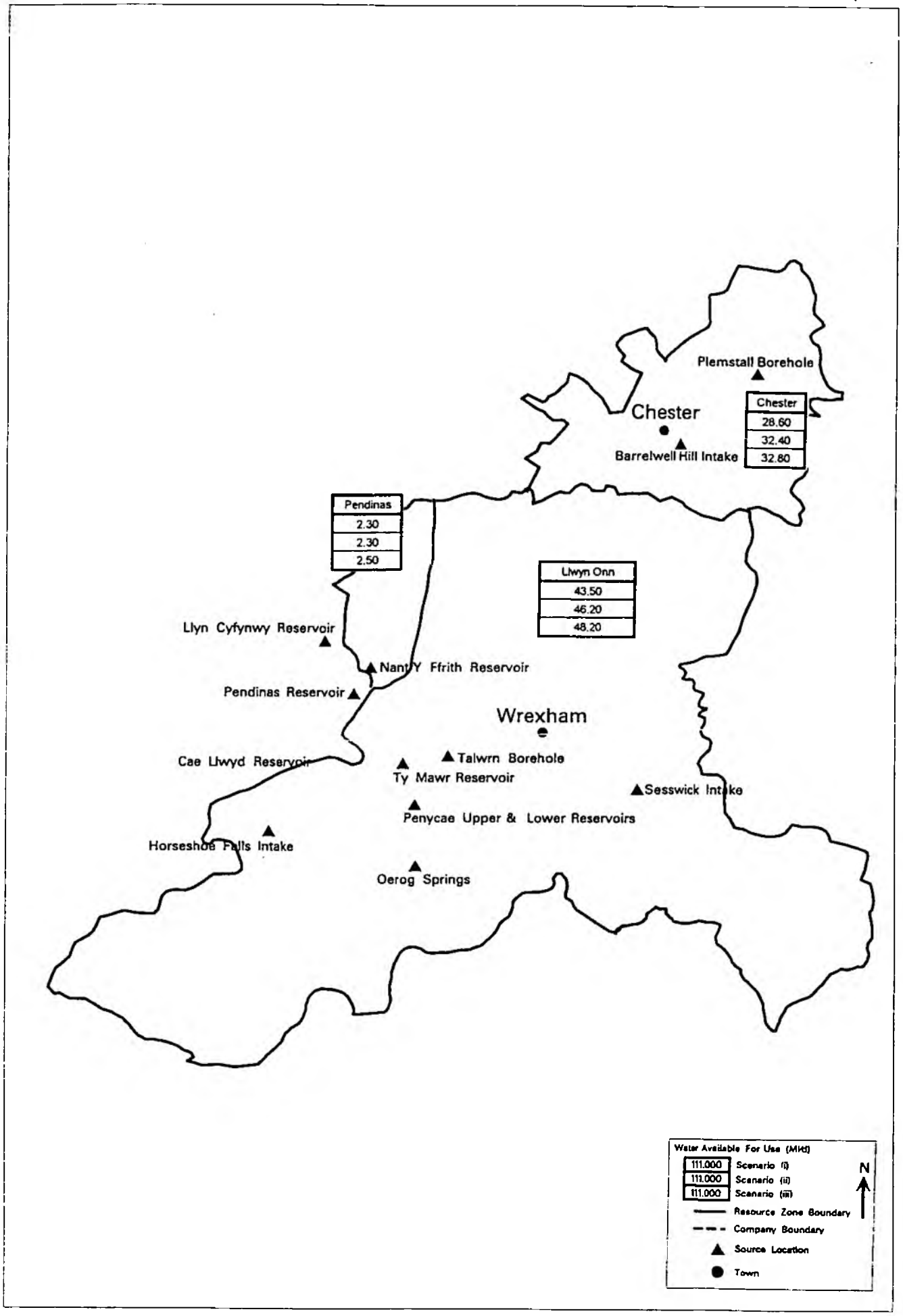
5 March 1998

-5 %

Dee Valley Water Plc

This company supplies the Chester, Wrexham and surrounding areas. It relies chiefly upon two abstractions from the regulated River Dee, together with a number of groundwater sources and small upland reservoirs. The two main supply zones reflect the demands of the two main population centres.

The Llwyn Onn zone yield reduces by 10% under Scenario 1 and 8% under Scenario 3. Yields from the River Dee are reduced under the methodology and so in the Chester zone they reduce by 11% and 10% respectively for Scenarios 1,2 and 3.



Welsh Region

WREXHAM AND CHESTER WATER SUPPLY AREA

WREXHAM AND CHESTER WATER COMPANY

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
LLWYN ONN	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Ty Mawr/Cae Llwyd, Pencae	4.90	4.90	5.10							
Dee - Twl, Bangor-is-y-Coed	27.50	30.20	31.00							
Run of River Schemes										
Twll				6.80						
Groundwater Sources										
Oerog					1.90					
Park Day Level & Speedwell Shaft					2.50					
Imports and Exports										
None										
RESOURCE ZONE TOTAL	32.40	35.10	36.10	6.80	4.40	0.00	0.10	43.50	46.20	47.20

TOTAL DEPLOYABLE OUTPUT (Ml/d)		
	Scenario 1	43.60
	Scenario 2	46.30
	Scenario 3	47.30

Change from Scenario 3 to Scenario 1	3.70 Ml/d	8 %
Change from Scenario 3 to Scenario 2	1.00 Ml/d	2 %

WATER COMPANY SUMMARY

PREVIOUS YIELD ESTIMATES	90.48 Ml/d	
TOTAL DEPLOYABLE OUTPUT	81.70 Ml/d	
DIFFERENCE BETWEEN 1994 AND 1997 YIELD ESTIMATES	-8.78 Ml/d	-10 %
1997 WATER AVAILABLE FOR USE	80.90 Ml/d	

WREXHAM AND CHESTER WATER COMPANY

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
PENDINAS	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
Pendinas, Nant y Ffrith	2.90	2.90	3.10							
Run of River Schemes										
None										
Groundwater Sources										
None										
Imports and Exports										
None										
RESOURCE ZONE TOTAL	2.90	2.90	3.10			0.00	0.60	2.30	2.30	2.50

TOTAL DEPLOYABLE OUTPUT (Ml/d)		
	Scenario 1	2.90
	Scenario 2	2.90
	Scenario 3	3.10

Change from Scenario 3 to Scenario 1	0.20 Ml/d	7 %
Change from Scenario 3 to Scenario 2	0.20 Ml/d	7 %

WREXHAM AND CHESTER WATER COMPANY

RESOURCE ZONE/SOURCE DESCRIPTION	SURFACE WATER DEPLOYABLE OUTPUT (Ml/d)			SURFACE SOURCES (Ml/d)	GROUNDWATER DEPLOYABLE OUTPUT (Ml/d)		OUTAGE (Ml/d)	WATER AVAILABLE FOR USE (Ml/d)		
CHESTER	*Scenario 1*	*Scenario 2*	*Scenario 3*		*Average*	*Average Day Peak Week*		*Scenario 1*	*Scenario 2*	*Scenario 3*
Reservoirs										
River Dee at Chester	26.50	30.30	30.70							
Run of River Schemes										
None										
Groundwater Sources										
Plemstal					2.20					
Imports and Exports										
None										
RESOURCE ZONE TOTAL	26.50	30.30	30.70		2.20		0.10	28.60	32.40	32.80

TOTAL DEPLOYABLE OUTPUT (Ml/d)				
	Scenario 1	28.70		
	Scenario 2	32.50		
	Scenario 3	32.90		
	Change from Scenario 3 to Scenario 1		4.20 Ml/d	15 %
	Change from Scenario 3 to Scenario 2		0.40 Ml/d	1 %