



# Water Resource Associates

*A network of consultants in hydraulics, hydrology, groundwater & environmental issues*

**Project title:** Development of Water Resource system models to allow deployable output assessment for Severn-Trent Water.

**Summary:** Producing an extended daily flow record from 1920 to the present and using it to assess the deployable yield of Severn-Trent Water's surface water resources.

<b>Client:</b> Severn-Trent Water	<b>Financed by:</b> Severn-Trent Water
<b>Period of assignment:</b> 1997 – 1999	<b>Location:</b> Severn, Trent and Wye catchments, UK
<b>Project Value:</b> £81 000	<b>WRA services:</b> £81 000
<p><b>East Midlands Resource Zone</b></p> <p>LEGEND</p> <ul style="list-style-type: none"> <li>Catchment</li> <li>Groundwater sources</li> <li>Water treatment works</li> <li>Reservoir</li> <li>Gauging station</li> </ul> <p>RESSIM Water Resources Model</p>	
<p><b>Simulated and Recorded Flows - Severn</b></p> <p>calibration of HYSIM model</p>	

## Background

In common with other water companies, Severn-Trent had a statutory requirement to re-assess the yield of their water resources. The guidelines were laid down by the Environment Agency to ensure that all water companies calculated the reliability of their sources in a similar way.

## Scope of work

WRA worked in two main areas. Firstly it was necessary to produce a long-term flow record for all the major surface resources. This was done using the HYSIM rainfall/runoff model. It built on work done earlier on the Trent but included updating simulation of the Trent basin and new simulation for the Severn and Wye basins. Secondly, using this data the RESSIM model was updated and modified to simulate all the surface resources of Severn-Trent. There is a high degree of inter-linking of the available resources and this demonstrated the ability of RESSIM to simulate complex water resource systems.

## Results

Severn-Trent have received an extended daily flow data record for all their resources. This data base makes maximum use of observed and naturalised flows in addition to simulated flows. The flows have been calculated in such a way that the effects of different patterns of irrigation, leakage control and sewage return can be studied. The resource model has enabled a complete re-evaluation of the reliability of the surface resources of Severn-Trent to be carried out. The model provided to Severn-Trent enables them to study new patterns of conjunctive use, the effect of different control rules and the possible benefits of new sources.

Project Number 000007

### Directors

Frank A K Farquharson  
Paul A C Holmes  
Dr A Nick Mandeville

Ronald E Manley  
Dr Andrew J Wade  
Professor Paul G Whitehead

### Head Office:

PO Box 838  
Wallingford  
Oxon OX10 9XA

Tel: +44 (0) 1491 838190  
E-mail: info@watres.com