

Optimum Use of Water for Industry and Agriculture Dependent on Direct Abstraction



**ENVIRONMENT
AGENCY**

The Water Resources Act 1991 and its preceding legislation provides the Environment Agency with the means to manage water resources through the licensing of abstractions. Each licence application is judged on its own merits and water is allocated on a first come basis. The Agency has the duty to ensure that the proposed abstraction is "...securing the proper use of water resources ..." Detailed techniques are available to assess Public Water Supply applications, but there is currently little guidance concerning the water needs of industry and agriculture.

This R&D project provides information on the optimum water requirements of different agricultural and industrial practices, and will allow EA staff to assess whether an existing or proposed abstraction is taking the appropriate quantities of water for the identified purpose.

The report is divided into three main sections, Agriculture, Industry and Potential Future Research.

Agriculture : Optimum water requirements for irrigation demand have been defined for varying agroclimatic conditions and soil types within England and Wales. Irrigation look up tables have been developed to enable EA staff to determine the dry year irrigation demand for principal irrigated crops including early and main crop potatoes, sugar beet, cereals, grass, vegetables, orchard fruit and small fruit.

The look up tables are based on seven agroclimatic zones of Potential Soil Moisture Deficit (PSMD), and three main classes of soil Available Water Capacity (AWC). To illustrate the use of the tables a worked example is included, showing the estimation of the annual irrigation requirements for 40 hectares (ha) of main crop potatoes, 40 ha of sugar beet and 100 ha of cereals.

Further background information is also provided on the efficiency of irrigation systems, the value of irrigation scheduling and the cost benefits of irrigation. The report also provides data on stock water requirements for dairy, beef, pigs, sheep, and poultry.

Industry : Water consumption data has been collected from a wide range of sources including published literature and industry contacts, to generate a series of look up tables for a wide range of industrial processes. The aim of the tables is to allow EA staff to calculate an initial estimate of the water needs for a particular site, in order to assess whether existing or proposed abstraction levels are reasonable. Two worked examples are provided, considering the manufacture of lead acid batteries and medium density fibreboard, to illustrate how the tables should be used in practice.

In addition to water consumption data, the tables provide information on the water using steps within each industrial process and the potential water saving initiatives which could be employed to reduce future consumption.

Conclusions & Recommendations : The data in this report provides an authoritative source of water use figures which will enable EA licensing staff to audit licence applications more confidently. Additionally the data will assist the EA in promoting best practice water use amongst its customers and throughout the water industry.

The report is seen as a working document and should be periodically updated with new and revised information. Recommendations on how the research could be further developed are also set out.

A second project phase is planned in the future to build upon the work already undertaken.

This R&D Technical Summary relates to information from Project W6-018 contained in the following output:

R&D Technical Report W157: Optimum Use of Water for Industry and Agriculture
Dependent on Direct Abstraction

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Project Manager: Bob Vaughan September 1998

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© Environment Agency
Rio House
Waterside Drive
Aztec West
Bristol
BS12 4UD

Tel 01454 624400
Fax 01454 624409

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