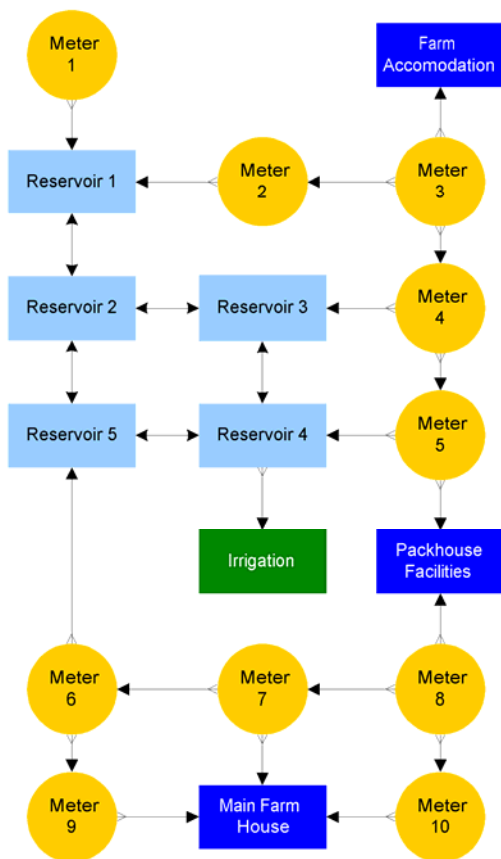


Agricultural industry

Irrigation water optimisation

Farm On-site Irrigation Network



The customer operates a salad crop growing business that predominantly uses potable water for irrigation purposes.

Potable water is stored during the winter months in five reservoirs that hold up to 28 million gallons (127,000 m³). This water is drawn upon during the growing season to supplement the water available from the Anglian Water mains system to irrigate up to 6,000 acres of salad crops.

Having sufficient water available to meet the significant seasonal demand is critical to the success of this business. Failure to meet the seasonal demand requirement could have devastating consequences; water resource planning therefore is a complex operation that requires careful management and control.

In this particular case, the situation is made more complex as the farm is continuing to increase in size year on year.

Optimiser conducted an investigation to:

- Determine the peak capacity limits of the farms distribution system and how this could be improved;
- Predict the effect of the additional anticipated demand forecast;
- Determine the optimum way to obtain water from the Anglian Water infrastructure without detriment to neighbouring customers.





study findings:

Optimiser created a hydraulic computer model that permitted all combinations of the reservoir, pumps and distribution to be tested.

The computer model was used to determine the optimum reservoir fill time and deficiencies within the existing water transfer regime.

An operating procedure was determined that would optimise the use of the existing infrastructure.

To fully utilise the capacity of the reservoirs it was recognised that it would be necessary to increase the water take from Anglian Water.

Water demand was already at the maximum level that could be sustained by Anglian Water's infrastructure during the peak summer periods. However, by increasing the demand during the off-peak winter period it would be possible to fill the reservoirs in time to meet the start of the early summer growing season.

Ensuring maximum capacity is available at the start of the growing season, and by operating a carefully planned draw-down system, it would be possible to reduce the maximum daily demand during the peak summer period.

recommendations:

The reservoirs should be filled during winter and early spring, to take advantage of any winter rainfall.

An additional water supply connection should be provided for use during the off-peak winter period only. This additional connection would optimise the filling of the reservoirs by taking advantage of any spare headroom capacity on the Anglian Water infrastructure.

Additional pumping equipment should be purchased to optimise the distribution of water from one reservoir to another. This would reduce the time to fill the reservoirs, and improve the distribution of water when it is required for irrigation.

benefits:

The customer has gained considerable knowledge about their operating infrastructure.

An operating regime has been developed that will permit the full optimisation of the investment in reservoirs.

A sustainable development plan has been created that will permit the continued expansion of the farm.

Additional security has been provided by the additional water supply connection, which will aid the quicker fill time that is required.

The customer can take an additional volume of water per year from the Anglian Water infrastructure without detriment to neighbouring customers and the need for costly infrastructure works.

Although their annual water demand will increase, the customer will benefit from a reduced Maximum Daily Demand (MDD) charge within the summer period. The optimisation process means that they will gain maximum benefit for least cost.