14.0 WATER CONSERVATION AND LEAKAGE CONTROL

14.1 Background

Prior to the establishment of the Leakage Management Programme in the early 1990's, Kildare County Council operated a passive leakage detection system. This was a reactive rather than a proactive policy and leakage problems were only addressed when serious leakage or supply problems arose.

In 1992 the Sanitary Services Department of Kildare County Council established the Leakage Management Programme. This was a well resourced, active programme which set out to identify leakage problems and to ascertain the level of unaccounted for water within the distribution system.

With the establishment of the Dublin Region Water Conservation Project (DRWCP) in 1997 additional resources and funding were made available to Kildare County Council in order to further improve its leakage management infrastructure. This programme covers up to 90% of the water supply network within the County.

14.2 Dublin Region Water Conservation Project (DRWCP)

The general objectives to the DRWCP may be stated as follows:

- Reduce water loss in the distribution network from 39% to 20% within five years.

- Provide Leakage Control Infrastructure in order to establish:
  - District Metering Areas (D.M.A.s)
  - Pressure Control Areas (P.C.A.s)
  - Telemetry Systems
  - Ground Information System (G.I.S.) of the region.

- Train local staff in water conservation techniques.
- Undertake a Public Awareness campaign to conserve water.

Anglian Water have been employed to provide the necessary technical assistance for the project.

In regard to County Kildare, the following works will be implemented under the programme:

a) the establishment of :

1) 21 No. District Metering Areas and Pressure Control Areas.

2) The installation of 65 No. meters.

3) The provision of a significant level of leak detection equipment including:
   - A fully equipped Leak Detection Vehicle.
   - Leak / Noise Correlators.
   - Aqualoggers.
   - Pressure and Flow Loggers.
   - Ground Microphones.
   - Sounding Rods.

4) The installation of 60 No. hydrants at Average Zonal Points (A.Z.P.s) or at high points within the D.M.A.s.

5) The establishment of a Computerised Telemetry System for the County, linked to the Greater Dublin System.

6) The setting up of a Water Conservation Management Structure within the County Council.

7) The formal training of the Leakage Control Team.

8) The construction of a G.I.S. model of the County Kildare Water Supply Network.

In 1998, an initial leakage survey of the network was completed. Over 500 leaks in the network were located and repaired. This survey also indicated locations where higher than expected consumption was being experienced and the second stage survey will now concentrate on these areas and more intensive leakage detection measures will be employed.

14.3 Current Leakage Levels

Significant improvements in the levels of unaccounted for water have been achieved since the introduction of the original Leakage Management Programme in 1992 and through the current more intensive Dublin Regional Water Conservation Project. In fact the latest figures (December 1998) indicate that the target level for distribution losses has already been surpassed at 17.97%. In Table 14.1 hereunder the December 1998 figures for County Kildare as prepared by the DRWCP Steering Committee are compared with those for 1994. The 1994 figures are taken from Table 3.2.8 of the Greater Dublin Water Supply Strategic Study.

Table 14.1

Breakdown of Consumption for County Kildare

Distribution Input - December 1998		1998	1994
Distribution Input	Ml/d	41.9	35.5
Domestic Demands			
Population	000's	117.98	98.5
Households	000's	35.58	26.6
Occupancy Rate		3.32	3.70
PCC (Excl. customer losses)	l/hd/day	139.10	135.0
Total Demand	Ml/d	16.4	13.3
Industrial Commercial Demands			
Metered Accounts	Ml/d	15.41	11.2
Fixed Charge Accounts	Ml/d	0.31	
Other Commercial Properties	Ml/d	0.00	0.2
Total	Ml/d	15.72	11.4
Losses			
Losses by Difference	Ml/d	9.8	10.8
Assumed Suppressed Losses	Ml/d	0.0	1.0
Total Losses	Ml/d	9.8	11.8
Total	% Total	23%	32%
Customer Losses	l/prop/day	60.0	60.0
Customer Losses	Ml/d	2.1	1.6
Customer Losses	% Total	5%	4%
Distribution Losses	Ml/d	7.6	10.2
Operational Usage	Ml/d	0.1	-
Net Distribution Losses	Ml/d	7.5	10.2
Net Distribution Losses	% Total	17.97%	28%
Targets			
Project Target (Losses)	Ml/d	8.6	
Reduction Required	Ml/d	-1.1	

Note: All Distribution Input values are taken as correct subject to calibration.

This Table is based on Table 3.2.8 from the Greater Dublin Water Supply Strategic Study Report 1996.

It will be noted that in 1994, total losses for County Kildare were calculated at 32% and Net Distribution Losses at 28% while the corresponding figures for December 1998 were 23% and 17.97% respectively. Accordingly very considerable progress in water conservation has already been achieved in County Kildare over a four year period.

It is the intention of Kildare County Council to train all their overseers and caretakers in Water Conservation under the current project and to extend their water conservation programme to the areas of the County which are not covered by the DRWCP.

14.4 Leakage Control Team

In the longer term, Kildare County Council are committed to maintaining a well resourced and equipped Leakage Team to control leakage levels within the County. The new Telemetry System in association with the G.I.S. will allow bursts and problem areas to be quickly identified. Remedial action will then be undertaken by the area overseer and his staff under the direction of the Leakage Engineer.

The Leakage Team which has been established in the Sanitary Services Department comprises a Leakage Engineer and three Leakage Inspectors, two of whom operate part-time as meter readers. These personnel will operate in conjunction with the local area overseers and the caretaking staff who will also have a role in leak detection and repair. The County is currently split into five Overseer Areas and a total of 16 Caretakers operate the water supply systems in these areas.

On completion of the DRWCP, when all of the leakage infrastructure and equipment is in place, the Leakage Team will be in a strong position to control and maintain low leakage levels throughout the distribution network.

14.5 Telemetry System

Under the DRWCP, a comprehensive Telemetry System is being established for the network currently served from the Lower Liffey sources.

A Control Centre for the scheme has already been established at the new Pumping Station at Leixlip from where information on the operation of the system can be fed into the Greater Dublin Region's Water Supply Monitoring System. In addition all information available at Leixlip can be accessed from the Council's Waterworks Department located at Newbridge.

In the future it would be proposed to expand this system to cater for the new water supply proposals outlined in this Study. The main objectives of an overall Control and Monitoring System for the County in the future would be:

(a) The water level status of the key reservoirs which act as surrogate Headworks in County Kildare needs to be known at all times, i.e. Old Kilcullen, Ballygoran and Allen Reservoirs.

(b) The groundwater well fields need to be monitored for drawdown of the cone of depression in each aquifer.

(c) Bulk Flow Meters on the principal Arterial Mains needs to be monitored in a general overview of flow linked to measured pressures at key network locations, but also to readily detect major bursts in time to protect against loss of reservoir contents, and to directly input to billing in the case of the Ballymore Eustace and Leixlip supplies.

(d) The status of the more strategic Plant items needs to be monitored so that failure of a duty unit is immediately signalled, e.g. pumps at Leixlip, or the Barrow Treatment Plant. Pollution monitoring of the River Barrow raw water would also fall into this category, so that intake to the Bunded Storage would be immediately discontinued.

(e) There ought to be telemetric communication between the Ballymore Eustace and Leixlip Treatment Plants and County Kildare Water Engineers to the extent that emergency conditions in the Greater Dublin area, requiring short term increases

in River Liffey demand by the Greater Dublin Authorities, are signalled as early as possible, so that Kildare can redeploy water sources to the maximum extent.

Security of the water supply installations must also be monitored, whether this be on a contract basis or via the Telemetry System at first hand.

In general, the systems would be capable of historical trending analysis at the Barrow Treatment Works and at the PLC's logging the Bulk Meter Flows and Pressure Transducers. The central supervision of the Council's Water Engineers would concentrate on the main condition indicators of the network overall, the Plant Operators on the other hand would concentrate on Control Limits for the parameters of the Drinking Water Regulations. With remote terminals capable of interrogating the entire system, it is no longer necessary to tailor Mimic Diagrams; it is the user who determines the information required.

The avoidance of different generations of telemetry systems developing as Phasing of the Kildare Water Strategy proceeds can present difficulties. However, we foresee reliance on the LGCSB approved In Touch system and their ability to manage successive generations of this software as the best approach we can recommend at this time.