

EXECUTIVE SUMMARY

The 1998 Drinking Water Directive specifies an interim Parametric Value (PV) for lead at consumers' taps of 25 µg/l (to be met by 25 December 2003) and a final PV of 10 µg/l (to be met by 25 December 2013). These requirements are given effect by the Water Supply (Water Quality) Regulations 2000 and the Water Supply (Water Quality) Regulations 2001 for England and Wales respectively. The Drinking Water Inspectorate (DWI) has put in place Regulatory Programmes of Work for plumbosolvency treatment and control measures (usually, dosing orthophosphate) with a requirement to optimise these treatment measures. The objective of optimisation is to determine the orthophosphate dose (and other conditions) required to meet consistently the lead standard – i.e. to determine the treatment conditions required to obtain the best practicable and consistent reduction in lead concentrations.

A key element of optimisation is demonstration of the effectiveness of the measures taken. The type of sample taken from properties in distribution to assess lead levels following the introduction or modification of treatment varies between water companies. The most commonly used sample types are random daytime (RDT) and stagnation samples taken from a fixed set of properties within distribution. As a general rule, the results of fixed-point sampling are less variable than RDT sampling because the stagnation time is controlled. An alternative, or complementary, approach is the use of lead pipe rigs located at the water treatment plant or at convenient points within distribution (e.g. service reservoirs).

The objectives of this project are to review, analyse and report to DWI on water company arrangements and plans for monitoring plumbosolvency treatment and control at treatment works and in distribution.

Information on each company's monitoring strategy was obtained principally by reference to DWI hardcopy and computer files including water company strategies for plumbosolvency treatment and control measures, DWI 2001 and 2002 Technical Audit inspection reports and completed proformas that were distributed to companies in advance of the 2002 Technical Audit. Additional information was obtained where necessary by e-mail correspondence with DWI's company contact. The information was summarised in terms of numbers of sampling locations of each type for each treatment scheme, the frequency of monitoring, parameters monitored in addition to lead and arrangements for monitoring the concentration of orthophosphate dosed. The use and operation of pipe rigs were reviewed. Information was also obtained and summarised on the frequency with which monitoring data are reviewed and what statistical techniques are used to assess the results.

Recommendations are made on monitoring strategies in terms of sample type, numbers of sampling points, sampling frequency and so on. Suggestions are also made on related issues, such as monitoring of orthophosphate dose. Examples are given of statistical methods for assessing lead monitoring data, including planning the number of samples required. Topics that merit further review are identified.