



Welcome to DWI Research News

This newsletter is intended to provide a brief summary of recent outputs of the Water Quality and Health evidence programme. The contents section to the right lists the projects covered, and provides useful links to our evidence plan, which lays out the aims and objectives of our research programme, and a quick link to Defra's E-tendering site to register your interest in our future competitions.

Recently published DWI research

Potential for Formation of Disinfection By-Products from Advanced Oxidation Processes

Under the EU Drinking Water Directive (98/83) there is a legal requirement to minimise disinfection by-product (DBP) formation. Historically most effort has concentrated halogenated DBPs, particularly chlorinated DBPs because of the widespread use of chlorine as a disinfectant.

Advanced oxidation processes (AOP), are becoming more commonly used to remove trace organics such as pesticides. These processes involve very reactive species and may lead to the formation of compounds that could be regarded as DBPs and for which no standard is specified in the Regulations.

The aim of this project undertaken by WRc, was to identify potential disinfection by-products (DBPs) that may be formed as a consequence of advanced oxidation processes and estimate any risks they may pose.

Contents

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	Page
Potential for formation of disinfection by-products from AOPs	1
Private Water Supply Zones Feasibility Project	2

[DWI Research pages](#)

[Defra's E-tendering site](#)



Analytical methods for the prioritised nine DBPs were investigated. Some methods are well developed such as nitrobenzene diols and dinitrophenols whereas other methods for compounds such as the hydroxynitrobenzoic acids, 4-nitrobenzene sulfonic acid, 4-nitrophthalic acid and 5-nitrovanillin will need further development to ensure they are robust and reliable.

Currently only two plants are using AOP within England and Wales and both these use GAC.

Based on the data currently available, it may be a reasonable expectation that, following formation of these potential DBPs via AOP treatment, their concentrations in drinking water will subsequently be reduced by GAC adsorption.

The study confirms there is relatively little use of advanced oxidation in England and Wales. For the nine DBPs studied in detail risks appear low but further research may help confirm this. The report provides a useful reference document on the type of DBPs formed for companies considering adoption of AOP.

The [full report](#) is available to download (PDF 2.52MB).

Private Water Supply Zones Feasibility Project

Local Authorities (LAs) in England and Wales have a legal requirement to monitor Private Water Supplies (PWS) to protect public health. The objective of this project, completed by Atkins, was to investigate whether it is feasible to group PWS together to reduce monitoring by sampling from a source which is representative of the water quality across a defined area. Grouping criteria for PWS were developed separately for surface and groundwater sources using delineations such as Water Framework Directive water bodies, bedrock geology and aquifer vulnerability. Criteria were grouped in two different ways, one simpler and the other more complex.

The homogeneity of water quality within these zones, and differences between them, were then assessed using historical water quality data from PWS in two trial LAs: Conwy and West Dorset.

Historical water quality data were interrogated using a number of methods to determine whether the

source water quality was consistent for the conceptual zones.

For a limited number of conceptual zones and determinands evidence of homogeneity was found using the Kruskal-Wallis test. These zones and determinands were taken forward to assess whether sampling rates could be reduced. Results indicated that savings would only be achieved in the laboratory as the sample points would still need to be visited to collect samples for other determinands.

Therefore due to the limitations with the number of data points available, a harmonised statistically acceptable approach has not been identified. The grouping of private supplies may be revisited in several years' time when more private water supply water quality data is available.

The [full report](#) is available to download (PDF 11.8MB)