In accordance with the Water Industry Act 1991, all water supplied in England and Wales by statutory water companies, and which is intended for all domestic purposes, must be wholesome at the time of supply. There is a similar legal requirement for private water supplies (i.e. water not provided by a statutory water company). Whilst water for toilet flushing falls within the definition of a domestic purpose, such a supply might not need to be of the same quality as that for other domestic purposes, provided it is used solely for toilet flushing.

Consequently, the Drinking Water Inspectorate (DWI) for England and Wales commissioned this research project to document the scientific information required to underpin a technical definition of wholesomeness to water from a natural source (e.g. springs or boreholes) used solely for toilet flushing in domestic properties without further preparation or treatment. This investigation takes into consideration public health risks and aesthetic issues, including the possible setting of standards for such a water supply.

A review of international studies on this topic identified that various guidelines/standards do exist for non-potable water used for toilet flushing in a number of countries. However, rather than a natural source of water, these concentrate on reused/reclaimed water such as grey or rainwater and may also consider the use of treatment such as disinfection, and so are of limited value in this review. These guidelines/standards are mainly based on two methodologies. A risk assessment is undertaken of the recycled water and the effects of toilet flushing in terms of dermal and aerosol exposure, or the values are based on those set for recreational water; for example, bathing water standards. This latter method yields standards which are less stringent than drinking water standards or values based on a specific risk assessment. In conclusion, there was no consensus on either a definition of wholesomeness or appropriate guidelines or standards for water sourced naturally and used solely for toilet flushing with further preparation or treatment. There is also a lack of basic research on the risks to human health associated with the use of non-drinking water for toilet flushing.

In the absence of such consensus, a risk evaluation approach was considered which could be used by local authorities and individuals or groups of individuals taking account of local conditions. Rather than a methodology based on standards, which would require monitoring, this approach is based on a traditional Source-Pathway-Receptor assessment considering potential microbiological and chemical risks which would exclude use of potential sources where a risk was identified and also further advise on pathways such as pipe fittings and storage. Such a risk evaluation process could work alongside the extensive advice provided by DWI on private water supplies.

The following recommendations are suggested:
The results of this review indicate that there is no consensus on a definition of wholesomeness and/or standards that can be used for natural water sources solely used for toilet flushing. Therefore, no change in legislation in terms of guidelines or standards is recommended.

A framework is suggested for risk evaluation of the use of natural water for toilet flushing. Such a framework could be subject to comment by water experts, local authorities and consumers and then a revised framework tested in a series of practical scenarios.

Any framework would need to be fitted alongside the existing private water supply guideline from DWI, which considers many of the same areas for private drinking water use.