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'MIND THE GAP' – WHAT'S MISSING IN PROTECTING DRINKING WATER QUALITY?

WORKFORCE RENEWAL AND SKILLS STRATEGY:
WHITEPAPER ON WATER SUPPLY AND PUBLIC HEALTH





This Whitepaper has been independently written by Phillip Mills, Director of Policy Consulting Network. PCN is an independent consultancy focused on understanding, analysing and communicating the key policy issues and legislative changes within the water sector to stakeholders and those looking for knowledge on the sector.

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Phill has extensive experience at senior management level with a water and sewerage company, a global water and energy consultant and the trade body for the water sector, Water UK. His track record includes working with various stakeholders including advising Ministers and government officials, industry regulators, consumer associations and environmental bodies.

Phill currently works with a range of clients across the water sector; water companies, sector bodies and those in the supply chain. His areas of expertise and experience cover water supply provision, water supply and wastewater infrastructure, charging, the retail market and customer service.

Phill's previous work at PCN includes leading a stakeholder engagement programme in Scotland and Northern Ireland, delivering the UK's Drought Engagement and Resilience Programme post the 2012 drought, advising the Scottish Public Service Ombudsman on complex water cases and leading the development of the plumbing assurance scheme, 'WaterSafe'.

Phill also chaired the Institution of Civil Engineers Water Expert Panel for three years, including acting as media spokesperson on water issues and chairing various high-profile conferences, seminars and webinars.

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EXECUTIVE SUMMARY

High standards of drinking water quality are an expectation for society and a necessity for public health.

In the UK, water suppliers developed and, over time, improved a set of principles for ensuring water supply hygiene. These principles include a requirement for those working on specified restricted operations to be trained and authorised under an approved hygiene scheme.

There are clear arrangements in place to ensure those individuals employed directly by water companies are trained and registered on the National Water Hygiene Scheme. However, there are question marks regarding the consistency in the interpretation of the term 'restricted operations' and whether other individuals, not employees of water companies, but carrying out work on water supply assets have the knowledge of, and are competent in, water supply hygiene. Any lack of training and awareness, and the subsequent actions or inactions, can present an ongoing risk to drinking water quality.

I. Context

It has been clear since 1854 when the doctor John Snow removed a handle from a public water pump in Soho, London and recorded the reduction in the local death toll from what he believed to be water-borne cholera, that providing clean and wholesome water supplies is essential for maintaining public health.

Fortunately, cholera does not occur in the UK today - the last indigenous case reported in England and Wales was in 1893. However; cholera is just one disease or infection that can be transmitted as a pathogenic microorganism in contaminated water.

It is essential therefore that those responsible for delivering public water supplies identify the risks and take sufficient precautions to protect drinking water quality at all stages - from collection of raw water in the catchment through to the treatment process and distribution network to the consumer's tap.

To achieve that, water suppliers in the UK have developed and adopted a series of water supply hygiene safeguards. Today these are encompassed in the 'Principles of Water Supply Hygiene (PoWSh)'¹, supported by risk assessment and mitigation processes within drinking water safety plans.

2. Introduction

This independent paper has been produced as part of a review of the National Water Hygiene Scheme (NWHS) carried out for Energy & Utility Skills.

Hygiene training and authorisation under an approved water hygiene scheme is a key requirement set out in the PoWSh. The NWHS is the sole approved water hygiene scheme in the UK.

This paper outlines how the NWHS helps to ensure the right understanding and approach to help deliver a public health culture across the water supply sector. However, it also highlights where there are potential gaps in the approach adopted by the sector and, in consequence, where opportunities exist to take further action in protecting public health and raising water supply hygiene standards.

3. Context today and philosophy of drinking water quality protection

Water companies today are reinventing themselves. They have moved away from the 'utility' asset owner/operator through a customer service company and onto an enhanced service company incorporating a social contract. The aim being to re-establish the trust of customers and water consumers by setting out the water company's contribution and role in society.

Fundamentally though, water companies are in the public health business – whether that is providing clean, wholesome drinking water or removing and treating wastewater before returning it, safely, to the water environment.

Adhering to the PoWSh is a fundamental requirement of being in the public health business. These principles are the foundation the sector is built upon. They are supported and developed by other company or industry measures and guides, including License to Operate, Competent Operator Scheme and Quality Management Systems etc.

This paper though focuses on the basics – the principles and the requirements set out in PoWSh and in particular the approved water hygiene scheme – the NWHS, also known as the 'Blue Card' scheme.



¹ 'Principles of Water Supply Hygiene' (October 2015, updated 1 March 2017) Royal Society for Public Health and Water UK. <https://www.water.org.uk/wp-content/uploads/2018/11/PWSh-Final-Mar-2017-Full-doc.pdf>

What do we classify as restricted operations?

The key definitions in PoWSH, effectively setting out its scope and application are 'Restricted Operations' and 'Restricted Areas'

'Restricted operations' means any work which may involve direct or potential contact with untreated sources of underground water; with partially or fully treated water within water treatment works, or any surface of an operational asset (including those temporarily out of use) which will itself be in contact with potable water at any stage in its distribution to the point where it is made available to consumers.

'Restricted areas' means defined areas within locations where water is prepared for supply, or where it is considered to be in supply in these areas of the site, including boreholes, wells, springs, treatment works, pumping stations, service reservoirs and all pipes in distribution systems to the customer's premises.

PoWSH goes on to state:

'All individuals working on restricted operations must have been trained and authorised under an approved water hygiene scheme.'

and

'Anyone undertaking restricted operations must therefore be registered on an approved hygiene scheme and carry a valid water hygiene training card.'



Figure I — The water supply chain – Catchment to Tap

Players that can impact drinking water quality and public health and the mitigation measures available.



Farmers, landowners, public.

Mitigation – catchment management

Water company staff, contractors, sub-contractors, self-lay providers.

Mitigation – NWHS, SHEA, COS



Water company staff, contractors.

Mitigation – NWHS, SHEA, COS

Water company staff, contractors.

Mitigation – NWHS, SHEA, COS

Plumbers, public.

Mitigation – WaterSafe, WRAS, Registered Plumber



Key

NWHS National Water Hygiene Scheme

SHEA Safety, Health and Environmental Awareness schemes

COS Competent Operator Scheme

WRAS Water Regulations Advisory Scheme

Attribution: Chris Downer / Canford Heath: the water tower; Tower Park

4. Risks to drinking water quality and the application of PoWSH

The risks to water supply hygiene extend from source to tap, as does the application of PoWSH and drinking water safety plans.

Most water companies have frameworks with contractors and suppliers to deliver their capital works and support the operation and maintenance of their networks. So PoWSH should, by definition, apply to not just the water company's own employees but also to those of all contractors, suppliers, installers – in fact anyone working in a restricted area. And since PoWSH applies, **individuals working for those contractors, suppliers and installers should also 'have been trained and authorised under an approved water hygiene scheme'**.

All water companies make possession of the NWHS card a requirement for all their own employees engaged in restricted operations, and in some cases even their directors.

Most companies could confidently confirm that any contractor visiting a manned water treatment works would be checked for compliance with the NWHS and be in possession of their blue card. **The position is less clear for third parties attending unmanned sites or working on the water distribution network** because:

- there is unlikely to be any checking,
- some contractors working on the network, especially smaller sub-contractors, are unlikely to be aware of the requirement and
- the work may be in a remote area.

And because of **differences in interpretation of 'restricted areas'**, its enforcement and a simple lack of awareness there will be individuals working on or around water supply assets that have not been trained in water supply hygiene and are not registered on the NWHS.

There is therefore a spectrum of risk assessment, risk mitigation, application and enforcement of PoWSH that is needed within the water supply chain. This is illustrated in **Figure 1**.

The key issue then is identifying and addressing the areas of vulnerability, i.e. the unmanned sites, the water network and the non-water company individuals working on these assets. They include:

- Contractors and suppliers working on source works, water treatment works, pumping stations and service reservoirs.
- Contractors and sub-contractors repairing or replacing water mains and services or laying new mains and services

- Non water company contractors laying new mains and services on new development sites.

5. The areas of unclear compliance and vulnerability

Contractors and suppliers working on source works, water treatment works, pumping stations and service reservoirs.

Individuals working for contractors, installers or suppliers on a regular basis for a water company are likely to have taken PoWSH training, be registered on NWHS. They will have been checked or even audited by the water company. The same may not apply to irregular subcontractors used on one-off jobs. Examples include plant or machine operators, scaffolders and other general trades in the construction sector, brought onto site by the main contractor for specific tasks. Without a water company representative on site at all times, or a random audit taking place, the water company is unlikely to pick up non-trained and/or non-registered individuals carrying out restricted operations or working in restricted areas.

Contractors and sub-contractors repairing or replacing water mains and services or laying new mains and services.

Individuals working for contractors, installers or suppliers on a regular basis for a water company are likely to have taken PoWSH training, be registered on NWHS. They will have been checked or even audited.

However, contractors carrying out mains repair or laying new water mains will at times use sub-contractors or hired-in plant operators. Whilst skilled in laying mains, these individuals may alternate between water and gas work and may not therefore be aware of, or trained in, water hygiene. Since these individuals will often be working in remote locations and only for a limited time it can be difficult for a water company to check that they are trained and registered under the water hygiene scheme.

Non water company contractors laying new mains and service on new development sites.

Many developers use Self Lay Providers (SLPs) rather than the water company to lay mains and services on new sites. Since SLPs are employed directly by the developer water companies have little control over their selection or management. SLPs can also make the connection into the water company's live network – subject to agreement and arrangement with the water company.

There is a 'Code of Practice for the Self-Laying of Water Mains and Services – England and Wales'².

Section 1.6 – Protection of Water Quality, states

'The SLP shall follow the current version of Water UK's Principles of Water Supply Hygiene and Technical Guidance Notes and any supplementary operational requirements of the water company.'

Effectively therefore **any individual working for an SLP should be meeting the same requirements as the water company's own workforce and their contractor's workforce, i.e. they should be trained in water supply hygiene**, registered on the NWHS and carry the blue card whenever doing work on new or existing water infrastructure.

There is an argument from some that mains on new developments do not fall into the remit of restricted operations and hence the workforce does not need to be registered. This is not correct. The definition of 'restricted operations' (see definition on page 4) includes 'any work which may involve direct or potential contact withany surface of an operational asset (including those temporarily out of use) which will itself be in contact with potable water....'

Clearly a new main on a development site will be in contact with potable water – and must therefore come within the scope of 'restricted operations'.

Some water companies may argue that it is not practical to enforce checks on SLPs they are not responsible for on development sites. That may be valid. The counter argument is:

- 1) water companies, not third-party contractors, are responsible for public health related to drinking water quality and
- 2) there should be no difference in the level of understanding of hygiene or compliance and hence the level of public health protection, whoever is providing new water infrastructure.

6. Solutions

The previous section highlights the main risks to drinking water quality and public health are from:

- Irregular construction workers operating intermittently on water production sites.
- Sub-contractors and their operators engaged on mains repair and mainlaying who may have a non-water background.
- Self-lay providers working on new development sites.

2 <https://www.water.org.uk/self-lay-code-of-practice/>

There are a range of solutions. The first is ensuring contracts and frameworks specify NWHS registration, not just for direct employees but also for sub-contractors and any other operators the main contractor involves in restricted operations. And this must be backed up by having systems in place for management, monitoring and audit of those indirect employees working in the supply chain to ensure they are NWHS registered. This should not be left to the main Tier 1 contractor alone to implement.

As for Self-Lay Providers, the code of practice requires they comply with PoWSh. It should be a condition of the water company adopting the asset that it has been laid by individuals trained in water supply hygiene and registered on the NWHS. This is likely to require some interim on-site monitoring by the water company.

Technology clearly plays a part in providing and maintaining high quality drinking water; but human understanding, response and behaviour leading to the wrong action or inaction can have a greater impact. Having made significant investment in technology and new treatment processes it is now time to focus on the hygiene culture to ensure the competence and right behaviour from all individuals from source to tap to ensure the quality of drinking water supplies, whoever their employer.

Underpinning all of this is the need for water companies to agree a clear and understood definition of 'restricted operations' that all companies, contractors and suppliers will work to, and for water companies to ensure compliance with the National Water Hygiene Scheme from source to tap, in accordance with their mandated requirement.

7. Conclusion

Drinking water quality is a major factor in protecting public health. The need for constant vigilance and the measures to protect and maintain high quality water supplies are set out in PoWSh. That document also defines 'restricted operations' and 'restricted areas'. Individuals working on restricted operations or in restricted area must have been trained and authorised under an approved water hygiene scheme. The NWHS is the only such scheme in the UK, and it is adopted and supported by all UK water companies.

Whilst water companies mandate the NWHS for all their direct employees working on restricted operations, there is variation in how companies apply and enforce the requirement on non-direct employees, i.e. those employed by contractors, suppliers, sub-contractors and self-lay providers working on water company assets.

Improved specification, monitoring and enforcement processes are therefore required to ensure that a key requirement of PoWSh, developed to ensure the maintenance of drinking water quality and the protection of public health, is fully complied with.

Key questions we should be asking the water companies, their supply chain and the wider sector:

1. Does the water industry in England and Wales have one collective and coherent understanding of the term 'restricted operations' for the approved hygiene scheme and does it support its current scope?
2. Is the existing scope of 'restricted operations' still current and robust to match the latest water quality regulatory risk approaches, and the changes in operational practices and industry structure?
3. Does the water undertakers definition of 'restricted operations' still match the perceived need of the drinking water regulators?
4. What procedures do water undertakers have in place to ensure that all personnel carrying out restricted operations, including those working for contractors, suppliers and sub-contractors, comply with the requirements of the approved hygiene scheme?
5. How is the supply chain keeping itself up to date on water hygiene requirements and ensuring its compliance across all UK restricted operations?
6. Are all self-lay providers operating to the approved hygiene scheme?
7. What further work can be done on frameworks and contracts to ensure the approved hygiene scheme is embedded across the water supply system from source to tap?



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