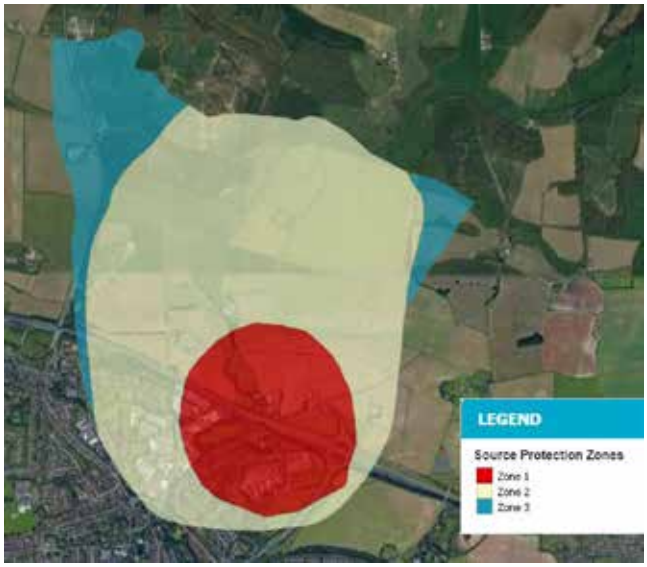
Housing Developments



Introduction

This Guidance Note is aimed at anyone proposing a housing development in Portsmouth Water's groundwater catchments. It identifies our key areas of concern in relation to groundwater protection and the means by which you can mitigate the risks associated with development.

Information relating to water supply and connection to the Portsmouth Water network can be obtained from our website.

Portsmouth Water

Portsmouth Water has been supplying water to Portsmouth and the surrounding area since 1857. Our customers include a domestic population exceeding 698,000.

Our area of supply extends through South East Hampshire and West Sussex from the River Meon in the west to the River Arun in the east. All our public water sources are reliant on the Chalk aquifer of the South Downs with approximately 85% of our water being directly sourced from boreholes or springs and 15% derived from the River Itchen, which itself is groundwater fed.

Our Groundwater Catchments

The groundwater catchments and associated 'Source Protection Zones' (see above) that Portsmouth Water utilise are particularly sensitive to pollution. Parts of the catchment are prone to solution features in the Chalk resulting in rapid travel times for groundwater moving from its source to our abstractions.

Solution features are formed as water passes through and dissolves the Chalk, creating underground cavities, sinkholes and large springs. Changes in ground or surface water flow can flush out existing sediment-filled fissures and sinkholes causing the formation of circular cylindrical or conical depressions at the ground surface. These zones have a higher permeability than the surrounding geology and therefore rapidly transmit groundwater and contaminants through them.

Due to the sensitivity of the catchments, Portsmouth Water needs to carefully manage the following risks posed by housing developments.

KEY RISKS

Each of the following 'Key Risks' should be taken into account at an early stage and understood in the context of a Conceptual Site Model (CSM) and risk assessment that may be qualitative or quantitative depending on the significance and nature of the identified risk. A Construction Environmental Management Plan (CEMP) may be required to outline the key environmental processes proposed on site during construction and provide information on what to do in the event of an incident in line with the applicant's Environmental Management Systems (EMS) policy.

Brownfield Development

Development of land that is contaminated poses significant risks to groundwater if not carried out correctly. Portsmouth Water considers a phased approach appropriate by starting with a desk study and literature review identifying all potential source, pathway and receptor linkages. The desk study should also include a site walkover and preliminary assessment for the potential presence of solution features.

Based on the findings of the desk study and literature review, an intrusive investigation may be required. In addition to chemical, geological and geotechnical characterisation, the investigation must aim to identify the presence of solution features that act as rapid pathways for pollutants. A risk assessment should be completed incorporating the hydrogeological setting and any contamination identified. This phase is typically followed by an options appraisal and, following approval, remediation and validation testing.

The fundamental basis for all this work is the construction of a CSM. A CSM is a dynamic model that acquires more detail as the project evolves. It should represent the anticipated site conditions and the interactions between different processes, both natural and man-made.

The CSM is a vital tool to understand the potential risks associated with land contamination and the risks to our water supply from development.

Portsmouth Water may request monitoring as part of a planning permission and will require assurances from the developer, local authorities and regulatory bodies that the development of land affected by contamination is being carried out in a way that protects groundwater quality.

Without an approved desk study, site investigation, conceptual site model and risk assessment Portsmouth Water would object to developments on land that could pose a risk to groundwater.

Importation & Use of Soils on Construction Sites

The sustainable use of soil on construction sites is influenced by legislation related to waste, national recycling objectives and incentives and UK regulation on waste. The Environment Agency is responsible for enforcing waste management legislation in England and Wales and regulation is currently discharged under the terms of the EU Waste Framework Directive.

The importation of contaminated soils into the catchment is a concern due to the potential for contaminants to leach into groundwater; therefore, prior to development, advice should be sought from the Environment Agency on the requirements for importing and using soils on site for construction.

Drainage & Sustainable Urban Drainage Systems (SUDS)

It is essential to present the proposed drainage methodology of a new development early on in the planning application process. There are significant risks to groundwater associated with new surface and foul water drainage proposals.

Portsmouth Water has a presumption against the discharge of foul and surface water into ground where adequate pollution prevention measures are not in place.

There are areas in the catchment where Portsmouth Water would object in principal to discharging surface/foul water due to the risk of contamination. These locations are in Source Protection Zones – SPZs (see the Government's groundwater protection guides), areas close to our abstractions, and areas known to have solution features present.

All applications for the construction and installation of deep bore soakaways should be accompanied by an adequate risk assessment demonstrating how the risk to groundwater would be mitigated in the proposed design.

For foul drainage in SPZ1 we require the use of the highest specification pipework and designs for schemes to minimise leakage.

Where SUDS are proposed in sensitive areas to manage surface water, we would welcome being consulted to advise you/developers on what measures would be appropriate to protect groundwater quality. This may include settlement chambers, separators, syphon heads and/or regular monitoring.

Drainage plans may take the form of Surface Water Management Plans (SWMPs) and these are encouraged to ensure a suitable and reliable drainage strategy is adopted early on and, in particular, during the construction phase of the development. The means of site drainage during the construction phase may form part of a Construction Environmental Management Plan (CEMP) that outlines how surface water is to be managed during construction, along with the Environmental Management Systems (EMS) on site to prevent pollution from spills and leaks.

Piling & Foundation Design

Due to the nature of the Portsmouth Water groundwater catchments and hydrogeological regime there are risks to groundwater associated with piling and other intrusive works that penetrate the ground, including:

- Increasing rates of turbidity through vibration;
- Creating pollution pathways; and
- Introducing contamination into the underlying aquifers.

It is important to consider these risks when devising a foundation scheme for a new development and demonstrating in the piling risk assessment how solution features and contamination have been assessed and built into the design.

Dependent on the proximity of the development to our groundwater abstractions we may wish to be consulted on the piling risk assessment.

Storage of Chemicals and Polluting Materials

During construction there is the potential for polluting materials to enter the environment as a result of leaks, spills or pollution incidents.

Good housekeeping and environmental management will reduce this risk and regular maintenance of plant and machinery on site will ensure best practices are followed.
Bulk storage of chemicals and hydrocarbons (oils) should be carried out on impermeable surfaces and in accordance with British Standards. Pollution prevention measures should include bunding, secondary containment where feasible and an incident response plan, including spill kits on site and training of site staff on how to use them. This information should be presented in the EMS and form part of the CEMP, to be readily available to all staff whilst working on site.

Useful Guidance

You can read the following guidance by clicking on the links below:

Groundwater protection guides covering: requirements, permissions, risk assessments and controls

Land Contamination: Risk Management

CLR11 Model Procedures for the Development of Land Contamination

The SUDS Manual 2015 CIRIA 753 (including the handbook for the construction of SUDS: CIRIA 698)

Pollution Prevention Guideline 3 Use & Design of Oil Separators in Surface Water Drainage Systems

How Safe is your Heating Oil Storage Tank?

Piling into Contaminated Sites, National Groundwater and Contaminated Land Centre, Environment Agency

Acknowledgement
Portsmouth Water would like to acknowledge West Sussex County Council for the provision of photographs for this guidance document.

Further Information

Other Portsmouth Water Guidance Notes in this series:

- **Commercial Developments**
- **Oil and Gas Developments**
- **Minerals and Waste Developments**
- **Agricultural Developments**

For further information please contact Portsmouth Water:

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