

Water Management

The management of water has been an important consideration in mineral products since historical times, limiting the ability to operate effectively and safely at numerous sites. The need to consider water issues with care has increased significantly in recent times due to greater regulatory controls, the increased scale of mineral products and increased public awareness of environmental issues.

What is it?

Water can impact on mineral products in several ways:

Practical:

- Sub-watertable working requires the pumping of water from quarry voids
- Sufficient pumping capacity is required to remove all the anticipated volumes of water
- Discharge to watercourses can result in adverse impacts including increased downstream flood risk and adverse environmental change
- Dewatering causes drawdown of the watertable which can have adverse impacts if not managed correctly

Regulatory:

Throughout the UK, water issues are subject to national and local regulation. The regulators with primary control for implementing and enforcing national and UK regulations are the Environment Agency (England), National Resources Wales (Wales) and the Scottish Environmental Protection Agency (SEPA) (Scotland). A proportion of regulation associated with Flood Risk has now been devolved to Local Authorities.

An Environmental Permit is required to discharge water off-site.

Comment:

The change to the landform caused by mineral products, the interception of rainfall, groundwater drawdown and the discharge of water derived from dewatering all have potential to impact on the water

environment. Water may also be abstracted and re-used in mineral processing. The discharge of water off-site has potential to allow contaminants to enter local watercourses.

Environmental impacts can be direct or indirect and the effects can be short-term and reversible, primarily associated with the mineral products phase, and/or long-term and non-reversible. The understanding of these effects, before they occur, is essential to ensure that all likely potential impacts are identified.

In order to manage water effectively it is necessary to fully understand the water environment in the vicinity of a quarry. This includes consideration of surface water and groundwater conditions.

To understand elements of the water environment, it is necessary to monitor the water management system within the quarry and the natural, surrounding system. This can include measuring volumes of water pumped around the site, measurement of groundwater levels, volumes of water pumped off-site, stream flow, water quality and water-supported features of ecological interest.

Monitoring data can be incorporated into a water audit, which assesses, in a structured way, both natural and water-management elements of site operations.

The maxim 'If you can't measure it, you can't manage it' is true of effective water management.

The frequency of monitoring and number of monitoring locations should be appropriate to the potential impact associated with a particular water issue. This can be difficult to determine: too little data and valuable information may be missed. Conversely too much leads to over analysing and a disproportionate amount of time and expense collecting it. The amount of data collected should be determined by an appropriately qualified person.

Why is it important to me?

Water management is becoming a strategic issue for all operators. Changes in regulatory requirements as well as environmental considerations are driving better management of water, which is also helping operators to achieve cost savings.

It is the responsibility of all staff to identify and report situations where pollution of water or other water-related problems could occur. These may include incorrect storage of fuels or chemicals, poor quality water and absence of good practice.

IQ believes that good understanding of water management is important for quarrying professionals to help improve operational performance and effectiveness on site. It features on our **Skills Wheel** which captures all the key skill and knowledge areas we believe are vital to successful career development in the mineral products industry.

Where Next?

Institute of Quarrying

IQ supports professionals working within the quarrying and minerals products industry through membership and training. These factsheets are produced across a range of topics to share ideas and best practice. Further information can be found via the resources section on the IQ website www.quarrying.org.

Hafren Water Limited

Hafren Water Limited, which specialises in pragmatic water-management within the minerals industry prepared these notes in conjunction with IQ. Find out more about Hafren Water by visiting www.hafrenwater.com.