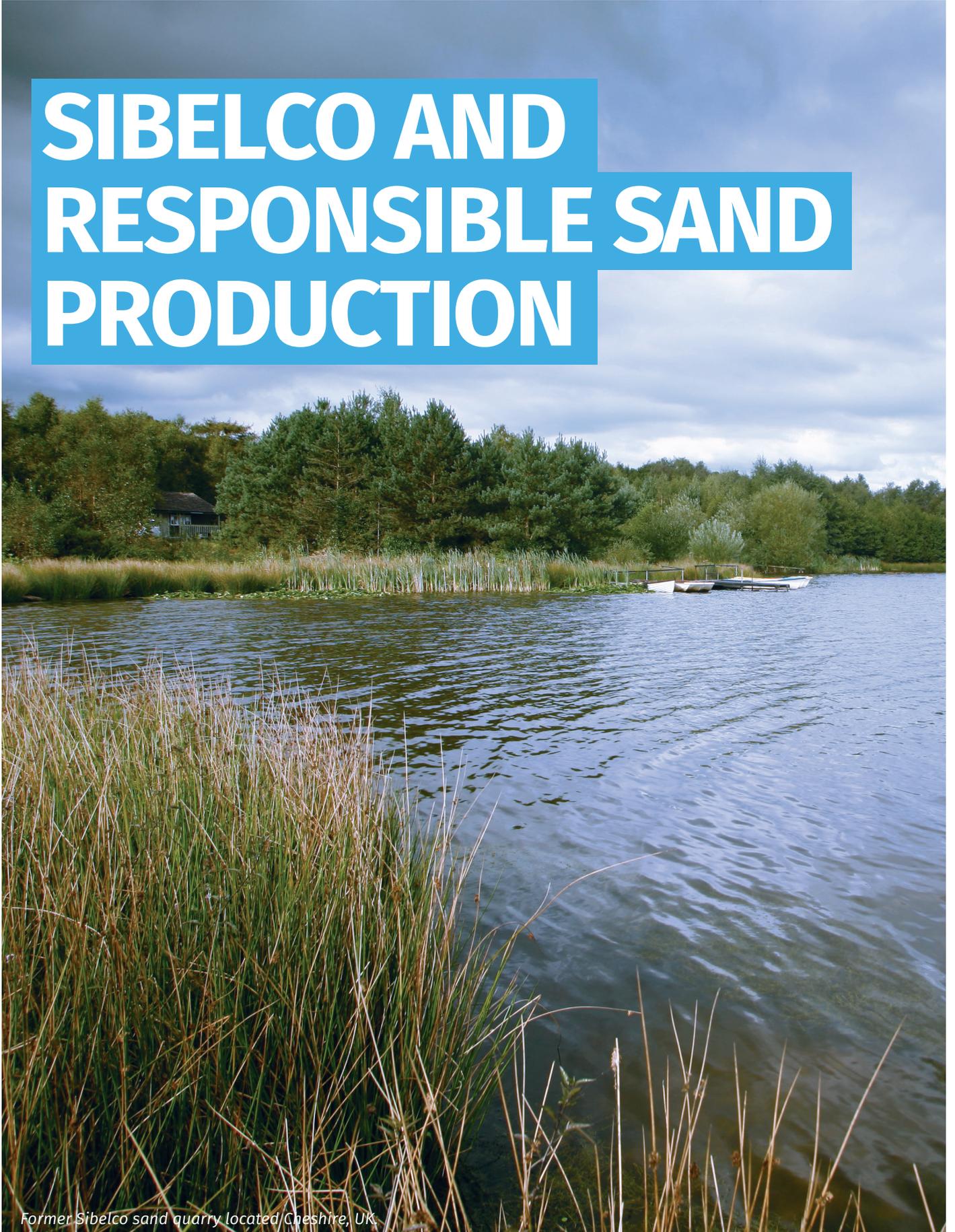


April 2022

SIBELCO AND RESPONSIBLE SAND PRODUCTION



Former Sibelco sand quarry located Cheshire, UK

SUMMARY:

Sibelco is committed to the responsible management of industrial sand deposits. This approach leads to higher product quality, a reduced environmental footprint and rehabilitation programmes that protect and often enhance the ecosystems in which the resources are located. Sibelco's approach is to ensure a sustainable supply of materials for its customers based on long-term resource management as well as through recycling and materials innovation.

In recent years attention has been drawn to the illegal exploitation of sand, for example from beaches and rivers. This has been captured in documentaries such as [Sand Wars](#) (2012) and articles in [The Economist](#) (2016), [Independent](#) (2017), [Nature](#) (2018) and [Business Insider](#) (2019). The [UN Environment Program](#) is also taking a close interest in the topic and published working papers on the topic in 2019 and 2022. Beyond the immediate concern about the illicit nature of such sand extraction and the environmental degradation it causes, some stakeholders have raised concerns about a possible shortage of sand for industrial applications.

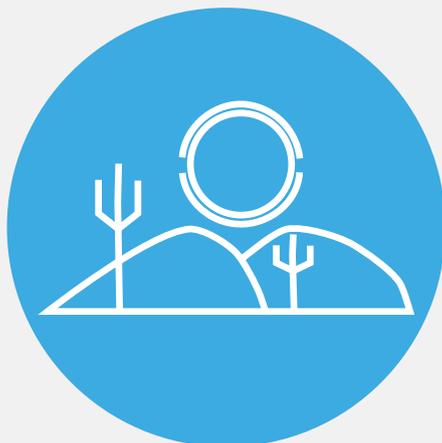
WHAT IS INDUSTRIAL SAND?

There is a marked difference between industrial crystalline silica and the sand typically associated with illicit sand trafficking and sand shortages. The latter is typically ‘young’ sand taken from beaches and river banks and used as a low-quality ingredient in aggregates for locally-consumed construction materials. Industrial silica sand (or quartz sand, as quartz is the predominant mineral) is plentiful on a global scale. However, its extraction depends on its quality – and therefore suitability for industrial applications – as well as its proximity to an industrial customer base and – most importantly – the ability to secure access rights to extract the minerals.



DID YOU KNOW?

Desert sand is unsuitable for industrial applications because it tends to have a high iron content and the grains have weathered so much over time, they have become spherical and have low shear strength. Also, most deserts are too far from where the sand is needed!



There are about 5,300 known minerals in the earth’s crust. About 30% of known minerals are silicates. Silicates have a crystal structure that includes Si as a chemical element and account for about 90% of the earth’s crust by volume.



SUPPLY AND DEMAND - THE MARKET FOR INDUSTRIAL SAND

The world's demand for sand and gravel is estimated to be between 30 and 50 billion tonnes a year. Of this amount, industrial silica sand only accounts for about 300 million tonnes a year (about 1 percent or less). Industrial sand production tends to be very much in line with industrial demand which comes chiefly from five sectors – glass (34%), foundry (22%), oil & gas (20%), high end building materials and ceramics (7%) and chemicals (6%). Source: Freedonia World Industrial Silica Sand Report 2016



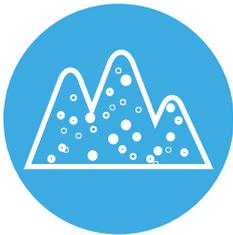
DID YOU KNOW?

A silica sand quarry tends to be no more than 300km from its main customer base to limit transport costs. Sibelco's quarry in Dessel, Belgium, is 8km from one of its main customers in the glass industry!

IS INDUSTRIAL SAND SCARCE?

The short answer is “no”. The long answer is more complex. While silica sand is abundant, identifying and accessing the deposits with the right characteristics (proximity to industrial customers, mineral composition e.g. low Fe content, community acceptance for quarrying) is not straightforward (see section on ensuring sustainable mineral management).

Through careful resource identification and management Sibelco aims to have a global resource life of more than 20 years of silica sand (i.e. those reserves that can be extracted under current permits).



DID YOU KNOW?

Globally Sibelco has access to some 20 years' of silica sand reserves.



SUSTAINABLE MINERAL MANAGEMENT

Accessing silica sand in a responsible way involves three main steps – preparation, operation and rehabilitation. Each phase includes the involvement of many people and significant financial resources. This approach is also used for all other Sibelco minerals such as clays, kaolin etc. The **preparation phase** – which lasts up to ten years – involves resource identification by Sibelco’s team of geologists, obtaining the right to access the mineral, land-use and environmental planning and finally the submission of an operating permit request to the authorities.

The **operation phase** involves all the aspects associated with responsible management of the resource during the lifetime of a quarry.

- Advanced *quarry planning* techniques are used to ensure access to the best minerals for Sibelco’s customers throughout the life of the resource.
- *Permit renewals*. Each permit renewal – which involve a high degree of public scrutiny – can extend the lifetime of a resource by up to 30 years.
- *Environmental management* is a key factor in ensuring a license to operate for Sibelco. This ranges from environmental impact studies, the management and reduction of environmental impacts such as air and water emissions and progressive rehabilitation of a quarry as parts of the quarry are decommissioned.
- *Safety* management is essential in ensuring a safe working environment at each site.
- *Stakeholder engagement* is a major consideration throughout the life of a quarry, ensuring that the views of local authorities and neighbours are understood and incorporated into the planning process.
- Ensuring *legal compliance* with the operating norms and environmental regulations.
- The careful development of a quarry also includes an in-depth analysis and separation of the various grades and qualities of the mineral, so as to match production with *specific customer requirements*.

The closure and **rehabilitation phase** involves the safe decommissioning of a quarry and its related processing operations and a rehabilitation of the quarry site in accordance with local requirements. Sibelco’s Closure Plan Policy is fully aligned with the International Council on Mining & Metals (ICMM) Integrated Mine Closure Good Practice.

Sibelco plans the closure and rehabilitation of each quarry many years in advance and for every tonne of material extracted makes sure it has the necessary financial resources provisioned to carry out the closure and rehabilitation. Sibelco deploys a pioneering Ecosystems Services approach to quarry rehabilitation – this aims to ensure that each quarry is rehabilitated in a way that will bring the most benefit to the local environment and communities.



DID YOU KNOW?



Sibelco can produce silica sand from a number of different sources – quartzite in Robilante, granite in Finland, silica sand in Maasmechelen....

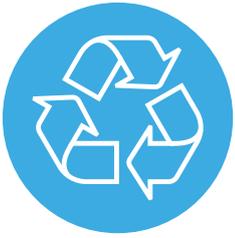
DID YOU KNOW?



Sibelco’s quarry rehabilitation practices have won numerous awards including the IMA’s Biodiversity and Ecosystems Services award for our heathland restoration work in Europe.

MATERIALS INNOVATION AND RECYCLING

Sibelco anticipates global trends and customer demand to relieve pressure on primary natural resources. This includes the development of recycling services, for example the recycling of glass or fibre glass, as well as entering into partnerships for the development of less resource-intensive materials such as low-density aggregates.



DID YOU KNOW?

- **Sibelco recycles some 2 million tonnes a year of glass and transforms it into glass cullet for reuse in the container glass and float glass industry.**
- **Sibelco recycles residues and by-products from the fibre glass industry thereby contributing to the circular economy and reducing CO₂ emissions in the supply chain by approximately 30%.**

For more information on Sibelco's approach to sustainability please contact:

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Material solutions **advancing life**