

# InnovOil™

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## IN THE WATER

Biocides from BWA

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# Bio logical

BWA Water Additives profiles its Bellacide 355® anti-microbial treatment for oil and gas operations

**R**ECONCILING the twin demands of proven effectiveness and environmental safety is a difficult business. Large-scale water use for industry and increasingly in oil and gas operations has meant a greater need for various treatments to ensure water quality and reduce the risks of contamination.

BWA Water Additives has worked exclusively on the research and development of these kinds of sustainable solutions since 1973, and specialises in scale control, corrosion inhibition, microbiological control and desalination.

BWA has a long history in supplying products specifically for the oil and gas market, having provided scale inhibitors for use in North Sea infrastructure since the early 1980s. More recently, the boom in US shale has seen BWA's next-generation biocides applied to a growing number of fracking operations, where advanced stimulation techniques and fracturing can use in excess of 5 million gallons (22.7 million litres) of water per horizontal well.

The water used for this process is obtained from a variety of sources, including municipal water, ground water, rivers, lakes/ponds and well flow-back water. Micro-organisms present in these waters, such as sulphate-reducing bacteria and acid-producing bacteria, can become established in the well and result in severe problems, including formation souring from sulphide production, formation plugging because of iron sulphide, and corrosion of equipment. To prevent these problems, an effective biocide programme is required.

## Bellacide 355®

Biocides commonly used in fracturing



Corrosion rate of N80 steel in mpy after 72 hrs



include bleach and glutaraldehyde-based products, but the former's chemical aggressiveness can increase corrosion, while glutaraldehyde-based products present a significant worker chemical exposure risk. An alternative biocide which overcomes these disadvantages is tributyl tetradecyl phosphonium chloride (TTPC) from BWA Water Additives, offered as Bellacide® 355. This biodegradable biocide is well suited to hydraulic fracturing and has been successfully applied in numerous shale gas basins, and other fields.

Bellacide 355 offers broad-spectrum biocidal activity, but is especially effective against the sulphate-reducing bacteria which cause the most problems if they become established in a well. It is deployed as an aqueous solution, and can be used even in heavily fouled systems. It will also rapidly degrade once in the presence of activated sludge, reaching 99% degradation after 96 hours.

As a non-oxidising biocide, it is less aggressive to equipment compared to oxidising biocides like bleach. In fact, in a standard high-temperature oilfield brine corrosion test, Bellacide 355 has been

proved to exhibit corrosion inhibition properties.

## Enhancing operations

As EOR operations become increasingly common, many of these recovery methods employ water, other products or processes which may lead to microbial growth. Polymer flooding and water flooding can result in issues with both scale and bacteria which, if left untreated, could even lower production from the well. Biocidal treatments are therefore vital to ensuring that EOR investments are worthwhile.

Anti-microbial programmes have also been shown to be a key part of well remediation. In conjunction with other techniques, biocidal treatments can help to restore an unproductive or declining well – a valuable asset to operators faced with the potential prospect of well abandonment. ■

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