

Press Release

Plants against Oil - BAUER Group constructs the world's largest commercial Reed Bed Water Treatment Plant



Purification of oil-polluted water? In environmental terms there can hardly be a more urgent problem waiting to be solved. As soon as the term 'oil production' is heard, one automatically thinks of the Gulf of Mexico and the disturbing scenes of the enormous oil slick choking flora and fauna alike. In this scenario, oil and water appear to be so irreconcilably linked that one would find it inconceivable for oil and

water to be separated by vegetation alone.

This pioneering development is being realised at a water treatment project in the Sultanate of Oman on the Arabic peninsular. Here, the MDAX-listed construction and equipment company Bauer, based in Schrobenhausen, Germany, is in the process of deploying a purely biological technique for the treatment of oil-polluted water on a large scale. Simple reed plants are used for the purification of process water from the oil production. It is a little known fact that oil rarely wells up to the surface by itself. As soon as the pressure inside a newly opened up reservoir declines, water is injected that will then eject the oil to the surface at another location. At current oil price levels, even water contents of up to a whopping 90 percent are considered to be economical. The vast quantities of oil-polluted water generated in this process can easily be imagined.

In the Nimr oil field in Oman only a tenth of production is pure crude oil. Around 250,000 cubic metres of contaminated water are generated daily. To date, the oil-polluted water is simply reinjected into the reservoir, which requires an enormous amount of energy and significant financial resources. For a long time, the well operator has been thinking about how the produced water can in future be treated in an environmentally friendly and energy-efficient way. At first glance, the solution does not appear to be spectacular – a reed bed treatment plant using locally grown reed plants. Over the past 10 years, the oil field developer has piloted the treatment of produced water by reed beds and tested the reeds' tolerance to polluted water - a real acid test for the plants. Surprisingly, however, the reed plants survive the poisonous cocktail almost unscathed.

A local subsidiary of the Bauer Group who's business activities in the "Resources" sector are continuing to grow significantly since its formation in 2007 has been appointed to develop the reed-bed technology, based on the pilot project, in such a way that the entire volume of produced water is treated. The contract has been awarded as a Design, Build, Own, Operate and Transfer (DBOOT) contract. This means that after completion of the reed bed treatment plant, Bauer Nimr LLC will also operate and maintain the plant for a period of twenty years – the overall contract value for the entire duration totals around US\$174 million.

Based on the four-stage pilot plant, Bauer's environmental engineer, Dr. Roman Breuer, was able, together with his team, to develop a suitable concept for a large-scale plant. The treatment plant is now also capable of removing any dissolved and residual organic matter in the water. What remains is clean water, which can also be used for agricultural irrigation purposes. But that's not all: the treatment process also produces biomass that can be used as a source of energy, for example, generating electricity. A further valuable by-product is salt that is produced in evaporation ponds and can be used by industry.

The actual reed bed treatment plant will be more than 150 times larger than the test field, covering a total area of 235 hectare – equivalent to around 450 football pitches. The vast area is already levelled and the beds have been constructed. As with every effluent treatment plant, the subsoil must be properly sealed. In selecting suitable sealants, synthetic materials were rejected in favour of a natural product. The surrounding desert areas were searched for suitable rocks until an appropriate sealant mixture was found. Soon, the first reed plants will be growing in the uppermost soil layer – initially around 1.2 million plants.

The largest commercial reed bed water treatment plant in the world will save not only an enormous amount of energy and real money in years to come, but of course also CO₂. Reeds grow almost anywhere and the energy consumption for the effluent is almost zero. As a result, the project is ground-breaking for the management of production water in the oil industry, which is primarily located in desert areas, and of course many other applications. Reed bed treatment plants can be applied to the treatment of domestic effluent of entire towns. The small states and emirates of the Middle East, in particular, are already investing in innovative products and techniques in the area of ecology – they are preparing for the period after the oil has run out.