



**GLOBAL WATER AWARDS**

The Nimr Water Treatment Plant project was internationally recognized and the team received the 'Global Water Award' for treatment of industrial water in Berlin.

The trophy was presented by HE Late Kofi Anan to the team.



**ROCK CUTTING**

The reed beds (wetlands) were built on an old ocean bottom, consisting of hard limestone.

Large formation of rock were blasted and shallow outcrops were removed by excavators equipped with rock breakers.



**CLAY PRODUCTION**

To complete the endeavours to keep the project environmentally friendly, it was decided to seal off the reed beds with an impervious layer of clay.

Saroor produced the material from identified and approved borrow pits, where clay was naturally occurring.

**EVAPORATION PONDS**

This photo shows the forest of Phragmites Australis, the collector channel of clear water and the vast evaporation ponds where a variety of fish live in.



**NIMR WATER TREATMENT PLANT**

In many cases, when oil is extracted from its reservoir it is accompanied by water known as produced water. Traditionally, this was re-injected into deep layers of the ground.

PDO commissioned Bauer GmbH of Germany to Build, Own, and Operate (BOO) a reed bed to biologically treat this water and clear it from its hydrocarbon content.

Saroor was appointed to build the Nimr Water Treatment Plant in its three phases using indigenous plant; a bacterium grows at its roots and breaks down the oil molecule.

Before entering the wetland, the bulk of the oil is separated by cyclonic effects and later collected by surface skimmers in the buffer pond. The clear water is guided to evaporation ponds.

The wetlands are now the permanent habitat for several kinds of birds and the stopover for many who migrate.

Research is being carried out at present to diversify the plantation from monoculture and investigate other ways than evaporation to optimize the uses of the treated water: production of salt, desalination, production of steam, and water injection as part of EOR techniques.



**BUFFER POND**

This aerial view shows the circular reservoir where the majority of suspended oil is removed by cyclonic effects before it is stored in a long and deep buffer pond.

The water is then equally distributed into the cells.

Evaporation ponds are seen in the horizon.



**TURNOVER POINT**

Water reaches the plant through an underground pipe from the oilfields.

It then goes into cyclonic oil separators which remove a large quantity of the oil carried by the water.

It is metered for payment purposes before it goes into a vast buffer pond and cascades down the reed beds.



**NEW HABITAT**

Several migratory birds rest for several months in this oasis. The reed beds have become a popular stopover for these great travellers.

Many of them now hatch in the wetlands, which has created a new micro ecosystem in this arid area.



**PIPEWORK**

Once the produced water reaches the buffer pond, it circulates through the reed beds only by gravity.

A discrete but comprehensive pipe network assists the water to reach all areas and guides the water on its journey through the 3 km long project.

**INLETS**

The first water that comes into the reeds is loaded with oil. It flows slowly by gravity from the adjacent buffer pond. This water will cascade down the four stages until it reaches the collector canal and the evaporation ponds.



**NIMR WATER TREATMENT PLANT (CONT'D)**

This successful project continues inspiring upstream operators, environmentalists, and scientists. With a daily inflow of 110,000 m<sup>3</sup> of water, the reeds are thriving and several species become residents in this new habitat in the middle of the desert.

Meanwhile, Bauer Nimr Oman LLC continues delivering several hundred barrels of recovered crude oil back to the Nimr production station through a dedicated flowline.

The treated clean water is now being used more and more to irrigate new plantations such as mangrove, cotton, jojoba, and medicinal algae.

Experiments are taking place presently to establish the impact that polymers used in the oil extraction process may have on the reeds.

The project has also opened opportunities for the re-use of treated water on the oilfields and it is better still to desalinate some of it using solar energy.

The reed beds have become a living laboratory for experimentation and innovation.

Another prospect for the future is the possibility of growing plants whose seeds give castor oil.

An agreement is in place between a factory in Duqm (Sebacic) and BNO to buy all of the off-take.

**PROJECT EXTENSION**

This drone picture shows parts of phase II of the treatment plant.

It shows progress being made simultaneously on several cells.

