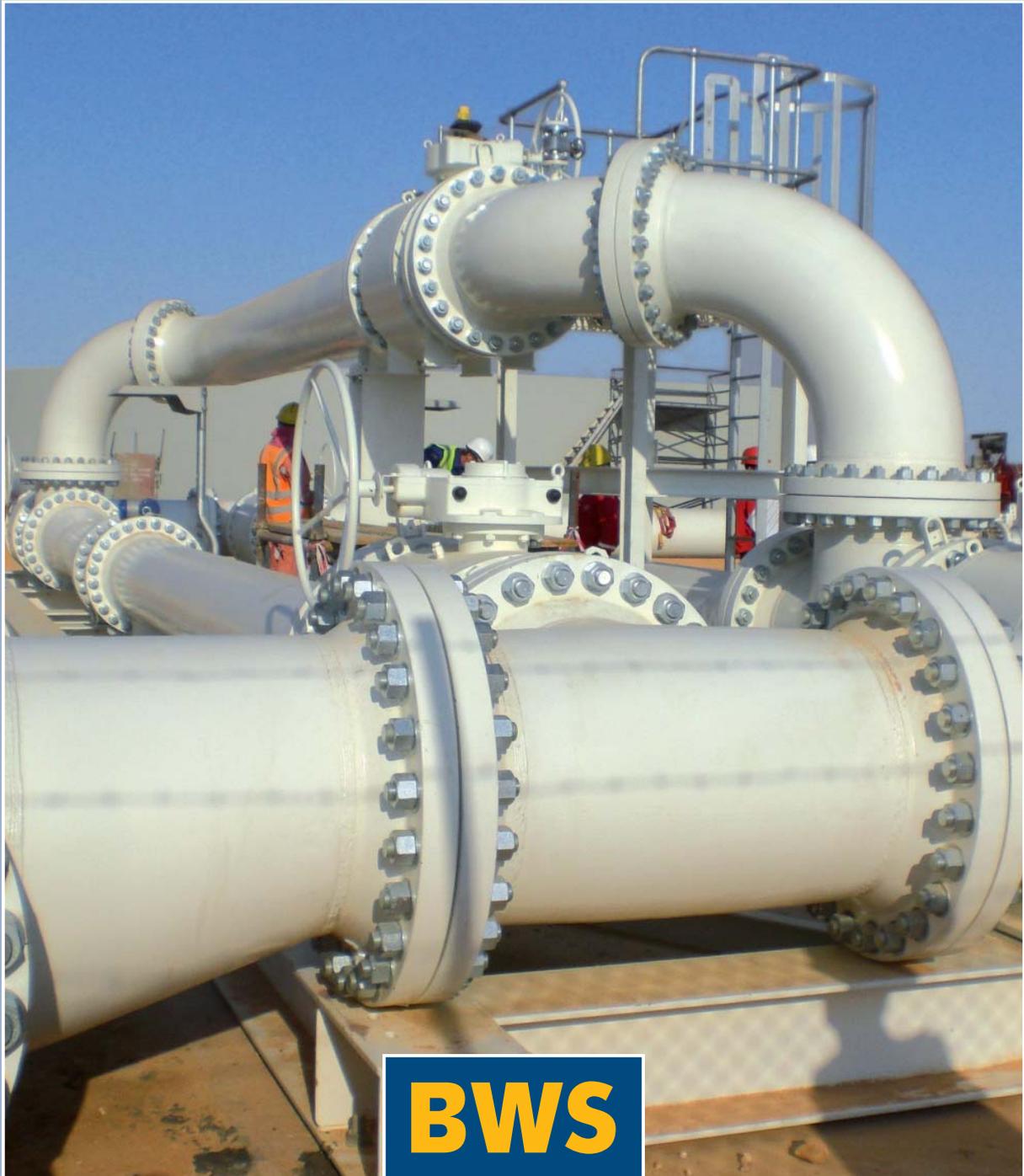


Produced Water and Frac-Flowback Water



Water in the Oil and Gas Industry

Produced water refers to the water trapped in underground formations that is brought along with oil and gas production.

Most common impurities found in produced water are oil and grease, salt, heavy metals, various dissolved organic and inorganic compounds and sometimes naturally occurring radioactive materials (NORM).

Being the largest waste stream from the oil and gas industry, produced water, if properly managed and recycled, can become a valuable resource.



Our approach – distinctive like our customers

As an industry leader, Bauer Water is providing comprehensive Produced Water Treatment Systems and sustainable, cost effective and customized solutions to the oil and gas clients. To accomplish this vision, Bauer employs and combines the full range of process technologies which include but not limited to physical treatment, chemical treatment, electrochemical treatment, biological treatment, thermal treatment. Bauer Water offers various models

from EPC up to DBOOT (Design, Build, Own, Operate and Transfer).

In harmony with nature

On behalf of Petroleum Development of Oman (PDO), Bauer has constructed world's largest constructed wetlands for the treatment of oil contaminated produced water in Oman's Nimr oilfield. This biological treatment system consists of a passive oil-water separator, surface flow wetlands and evaporation ponds, a combination of which is resulting in 99.9 % of hydrocarbon removal from the feed produced water. The Nimr Water Treatment Plant (Nimr WTP), being a gravity flow system uses minimal fossil fuel for its operation and therefore results in an enormous saving in energy consumption. Nimr WTP helped to decrease the carbon footprint by having maximized the use of locally available and naturally occurring materials for construction, treatment and reuse of oil contaminated soil

from the oilfields. At the same time it also helped to minimize electricity consumption and to decrease greenhouse gas emissions as well as environmental impacts of the oilfield. In this way, the project made a contribution to protect people and the environment. Moreover the BAUER Nimr WTP substitutes the conventional deep well disposal of produced water and therefore significantly reduces the impact of natural groundwater resources. The treated clean brackish water from the constructed wetland then flows into a series of evaporation ponds and a final salt crystallization step to eventually produce salt for beneficial reuse. The wetlands and ponds also provide a valuable habitat for migratory birds, with close to 100 different bird species having been identified at the site to date. Nimr Water Treatment Plant serves as an exemplary model of Bauer's commitment to an eco-friendly, sustainable solution for handling produced water in large scale.



Facts:

- Industry leader in produced water management using constructed wetlands. Experience of constructing hundreds of wetlands in various parts of the world
- More than 350 million barrels of produced water treated till date
- Winners of several awards for sustainability, technical innovation and environment-friendly treatment solutions
- Customized solutions for handling high and low salinity produced/flowback waters
- Two competence centers for water treatment headed by water treatment specialists with extensive experience in treatment technologies

Comprehensive Water Treatment Solutions

Produced Water Treatment for:

- EOR injection water
- Beneficial Reuse
- Surface Discharge
- Flowback/Fracwater
- Coal Bed Methane



Treatment Technologies:

- Bulk Oil Water Separation
- Gas Flotation
- Walnut Shell Filters
- Constructed Wetlands
- Chemical Precipitation/
Flocculation/Sedimentation
- Filtration (Media/Micro/Ultra)
- Electrocoagulation
- De-oxygenation
- Ion Exchange
- Reverse Osmosis
- Disinfection
- Evaporation Ponds
- NORM Decontamination

Services Offered:

- Consultation
- Feasibility Analysis
- Plant Design
- Planning & Execution
- Construction, Installation and
Commissioning
- Operations & Maintenance and
Project Management



COMPETENCES

- Consultation
- Planning
- Implementation
- Operation
- Service
- After Sales

PROCESSES

- Biological
- Chemical/Physical
- Disinfection
- Desalination
- Filtration
- Thermal

MARKETS

- Automotive
- Chemical Industry
- Energy
- Food & Beverage
- Mining
- Oil and Gas
- Pharmaceutical Industry
- Public Authorities



<http://www.bauer-water.com/en/company>



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