ecosys

WETLAND ECOSYSTEMS

Wastewater treatment with the power of nature

We will support you in progressing your company or community to a more sustainable future by using existing infrastructure without any extra financial cost!

INSPIRED BY NATURE
Ecological Wastewater Treatment

Ecosys® is a brand of BAUER Resources GmbH, which bundles the competences and know-how in the field of natural wastewater treatment.

> **Anything that is against nature, will not last in the long run.**

Charles Darwin, British naturalist and father
of the modern theory of evolution (1809-1882)

Nature has all the Answers.

Constructed wetlands – a nature based solution.

A constructed wetland is a nature based wastewater treatment system. Pollution is removed by a number of simple and natural processes. These processes are generated by the interaction of water, plants, microorganisms, soil, gravel and the atmosphere. Polluted water can be treated sustainably using the power of nature and energy from the sun with miminal operation and maintenance costs. Over the past decades, we have developed hundreds of constructed wetland projects, creating new ecosystems in the process. These range from compact sewage treatment systems up to the world's largest constructed wetland project: The Nimr Water Treatment Plant in the Sultanate of Oman. This facility consists of 1,208 ha of wetland terraces and ponds and treats 175,000 m^3/day of industrial wastewater from the nearby oil field.

Our competence provides design, financing, construction and operation of constructed wetlands.

Benefits, Advantages, Opportunities.

Constructed wetlands provide natural habitats, enhance biodiversity, reduce greenhouse gas emissions, and create landscaping opportunities including the potential to bolster defences against wild fires.

APPLICATIONS

- domestic/municipal sewage
- sludge dewatering
- industrial wastewater
- produced water

and many other applications ...

EFFECTIVE TREATMENT OF

- bacteria, viruses
- phosphorous, nitrogen
- inorganics
- fluoride, cyanide
- pharmaceuticals
- oil & grease
- suspended solids

and more ...

ADVANTAGES

- lower to no capital and operational expenditure
- carbon positive treatment of wastewater
- no treatment by-prducts
- no use of chemicals
- treated effluent suitable for reuse
- integrated sludge treatment
- low energy consumption
- short construction period
- long lifespan
- simple maintenance and operation

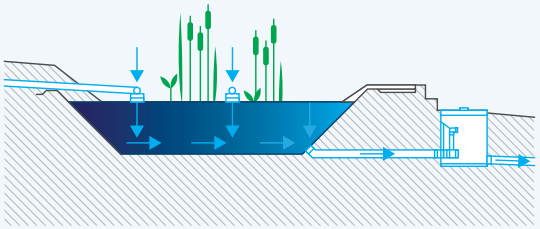
natural, green and sustainable


With the Power
of Nature.

Optimized and customized nature based solutions for all locations.

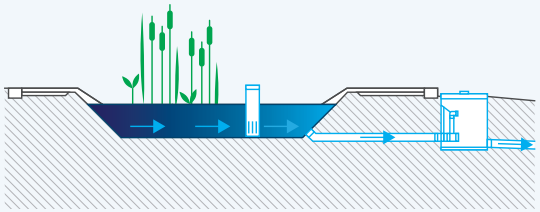
Depending on the project requirements we employ various wetland technologies individually or in combination.

Type 1 is a vertical flow system and an optimized and flexible standard solution for many locations that can be used for treatment of sewage.



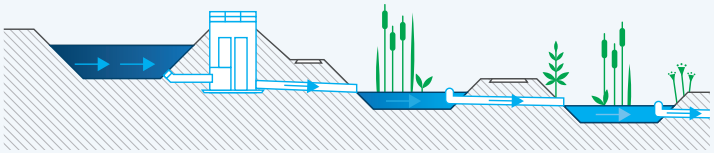
Type 1 / vertical flow

Type 2 is a horizontal subsurface flow system which is being used in combination with pretreatment or with the Type 1 system. A hybrid system (Type 1 followed by Type 2) achieves high treatment quality while eliminating the production of sewage sludge.



Type 2 / horizontal flow

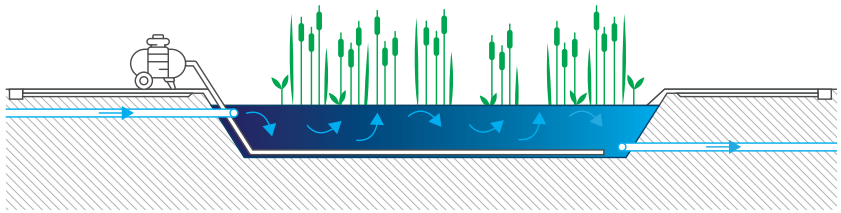
Type 3 is a surface flow wetland which is suitable for large scale applications including polishing of sewage effluent, produced water from the oil and gas industry, agricultural runoff and urban stormwater.



Type 3 / surface flow

Aerated wetlands

Aerated wetlands represent a state-of-the-art design modification of constructed wetlands technology. Artificial aeration enhances oxygen availability for removal of organic and inorganic contaminants from wastewater. The implementation of artificial aeration in constructed wetlands enables a significant reduction of the footprint. Aerated wetlands are an eco-friendly solution with low energy requirements.



Aerated wetlands / additional oxygen supply via compressors

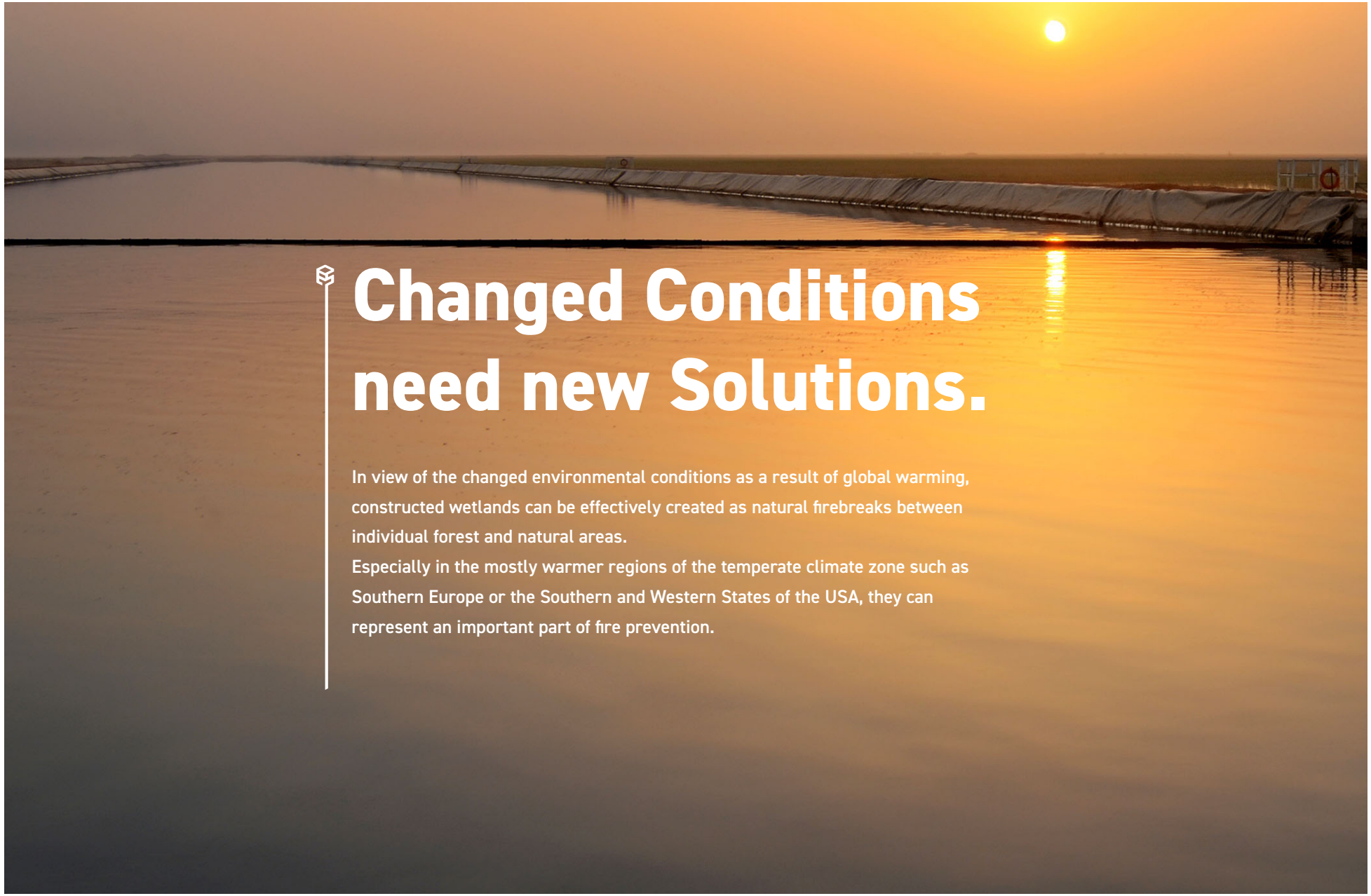
Sludge treatment wetlands

Sludge handling and management are major issues in conventional treatment plants (e.g. activated sludge).

Sludge treatment wetlands represent a unique ecological way for on-site sludge dewatering and drying.

Sludge treatment wetlands provide a cost-effective and sustainable alternative to daily sludge disposal or other expensive mechanical technologies.


Constructed Wetlands
as natural Firebreaks.



Changed Conditions need new Solutions.

In view of the changed environmental conditions as a result of global warming, constructed wetlands can be effectively created as natural firebreaks between individual forest and natural areas.
Especially in the mostly warmer regions of the temperate climate zone such as Southern Europe or the Southern and Western States of the USA, they can represent an important part of fire prevention.

Nimr Water Treatment Plant, Oman.

Recovery
900 barrels
Of crude oil per day

Energy saving
500 MWh
Per day

Reduction
200,000 tons
Carbon emission per year

KEY PROJECT DATA

- Footprint: 1.208 ha
- Inflow: 175,000 m^3/day
- Recovery of 900 barrels of crude oil per day
- Energy saving of 500 MWh per day
- Carbon Emission Reduction Certificates: 200,000 tons per year

ADDITIONAL BENEFITS

- Water reuse
- Biomass generation
- Habitat generation
- In-country value generation

Reference Project NWTP, Oman

Nature based solutions for the oil & gas sector – the Nimr Water Treatment Plant.

First project to be certified by the German Emission Trade Authority DEHSt to generate Emission Reduction Certificates.

Winner of the Global Water Award 2011

This pioniering project was launched by us in 2008 and with the **Nimr Water Treatment Plant (NWTP)** the Sultanate of Oman is adopting an exemplary ecological approach in the oil industry.

The unique system is treating up to 175,000 m^3 per day of industrial wastewater from the oil and gas industry.

The plant layout includes a produced water supply pipeline, which enters the NWTP system and leads to an oil and water separator. The water is then distributed by gravity into four terraces of surface flow constructed wetlands.

The overall area of the wetland, planted with a variety of endemic wetland plant species, is approximately 508 ha. Treated water from the wetland is then evaporated in 615 ha pond areas for future salt recovery.

Nowadays, research activities aim to investigate alternative re-use options of treated industrial wastewater for specific algae growth, agriculture and potable water production.

Nimr / before in 2009

Nimr / after in 2014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BAUER NIMR LLC

Living Sustainability.

Changing your wastewater treatment practice to constructed wetlands meets several sustainable goals implemented by United Nations and makes an important contribution to a livable future.

CLEAN WATER AND SANITATION

SUBSTAINABLE CITIES AND COMMUNITIES

RESPONSIBLE CONSUMPTION AND PRODUCTION

LIFE ON LAND

CLIMATE ACTION

Case Study.

Community with a population of 80,000

With our full financial backing and partnership, we would like to support you and your community by providing a sustainable and environmentally friendly solution that will not only utilize, but enhance the existing environmental infrastructure.

Population
80,000

Water flow
40,000 m^3/d

Savings of energy
UP TO 90%

Savings of overall treatment costs
UP TO 15%

Reduction of CO_2 emissions
UP TO 60%

No CAPEX required due to Design, Build, Own & Operate (DBOO) model.

Inspired by Nature.

Moving the world of today and tomorrow with innovative solutions.

For further information, please contact us.

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