

Innovative Solutions in the Process Industry for next generation Resource Efficient Water management (INSPIREWATER)



EU funding GA 723702

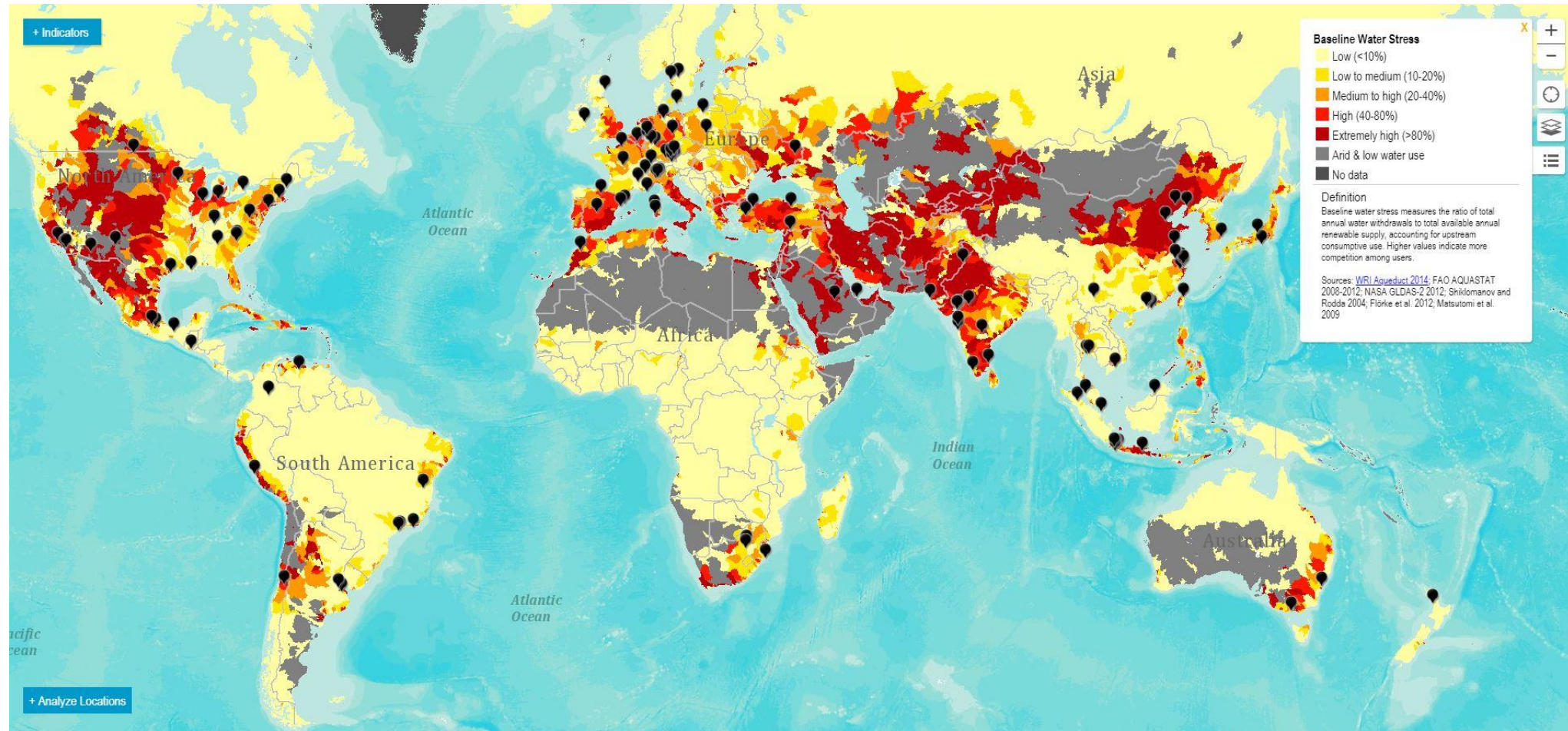


DUPONT™

Outline

- Project Motivation and Scope
- Objectives/Desired outcome
- Demonstration concept
- Project progress and status

Project Motivation and Scope



Water stress is a global issue

Project Motivation and Scope

Promote innovative and integrated solutions under Minimum Liquid Discharge (MLD) concept with different technologies as DuPont Water Technologies; MOL Katalysatortechnik GmbH; and BLUE-tec Process Water Technologies to:



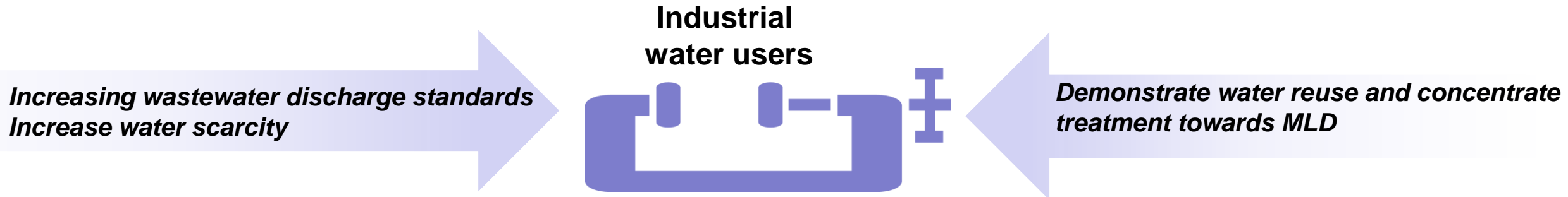
- **Demonstrate sustainability of integrated DuPont Water Solutions** in challenging feed waters with high organic content and high variability
- **Validate the MLD/ZLD concept with BLUE-tec FO** for brine treatment as a valid approach
- **Determine if innovative technologies as MOL catalyst are suitable technologies for fouling prevention**

Objectives/Desired Outcome

The overall objective of INSPIREWATER is to **increase water and raw material efficiency** in the process industry, supporting the **implementation of new resource efficient technologies**.

New and well-known technologies are integrated and used in innovative concepts towards minimum liquid discharge to:

- Demonstrate continuous operation with challenging industrial water conditions
- Demonstrate water reuse and reduce water consumption
- Reduce energy and chemical demands
- Minimize waste disposal



Demonstration Concept

CLARIANT case study

Current WWT concept in Clariant's Tarragona fulfils all requirements for water discharge. However, upcoming regulatory requests identifies the need for new and innovative solutions development.



SECONDARY EFFLUENT PARAMETERS



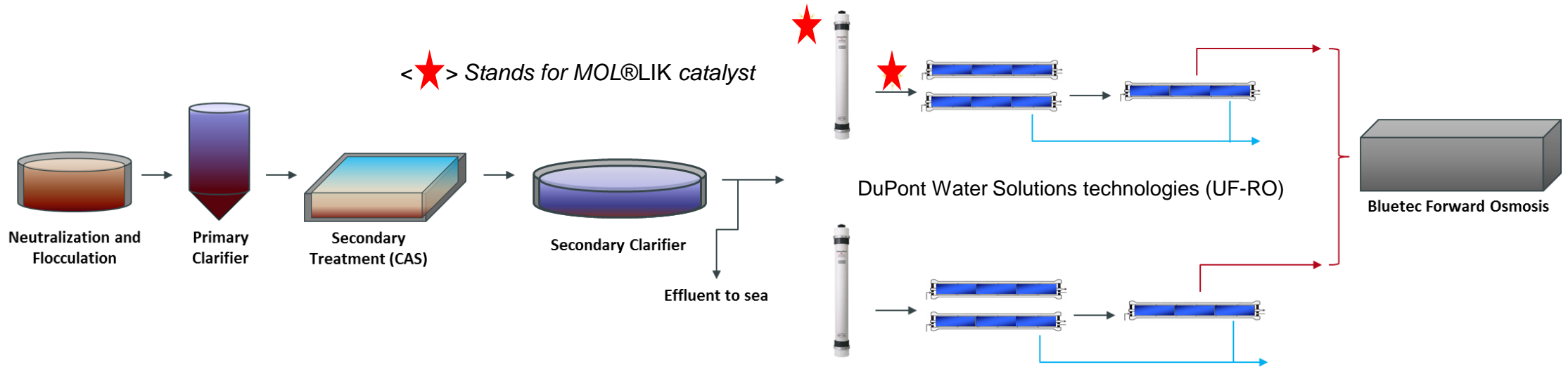
Parameters	Average
pH	7.8 ± 0.2
Conductivity	11.4 ± 5.6 mS/cm
TOC	129 ± 52 mg/L
COD	397 ± 133 (700**) mg/l
BOD	29 (300**) mg/l
Ammonia	22 mg/L
P-total	<2 (30**) mg/L

Feed water composition variable over time (4 discontinuous process and multi-purpose pilot plant – surfactants, detergents, emulsifiers, etc...)

Demonstration Concept

- Treatment of real industrial waste water secondary effluent → 5 m³/h.

Innovative and new integrated WWTP concept for sustainable and economic viable solutions



- Project timeline

3Q 2017

2Q 2018

2Q 2019

Commissioning + Start-up

Baseline

Operation

Experimental phase completed



Innovative solutions

DuPont Water Solutions

- *Innovative UF fiber with high permeability*
- *Fouling resistant RO*



IntegraFlux™ SFP-2880XP
FILMTEC™ FORTILIFE™ CR100



MOL®LIK catalyst

- *Long life metal foil*
- *Fouling prevention*
- *Catalytic, biocide free*



BLUE-tec FO/HBRO™

- *Energy efficient*
- *Temperature independent*



Project progress and status

- Challenging feed water variability leads to unstable operation. Moreover a more restraining pre-treatment (i.e: GAC) was determined as needed in order to cope with the high COD feed water content
- Despite the fact of challenging and variable conditions, Ultrafiltration (UF) operation was kept over time by optimizing the cleaning strategy and combining backwashes, chemical enhanced backwashes and mini-CIP concept.
- Ultrafiltration Technology (IntegraFlux™ SFP-2880XP) shows reliable removal of particles, suspended solids and colloidal material, and 10% organic components removal.
- Reverse Osmosis (FILMTEC™ FORTILIFE™ CR100) revealed a removal efficiency of ~99% COD and 98% salt at the specified operating conditions.
- High fouling and scaling rates were observed during specific operating periods.

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