

# CASE STUDY

## Petrochemical Wastewater Treatment

Location: Undisclosed (due to NDA)

Technology: REDOXY - An AOP from Watch Water

**WATCH**<sup>®</sup>  
**ER**  
WATCH WATER  
*a Water Company*



## BACKGROUND

Watch Water is a global leader in providing the best and most effective solutions for water and waste water treatment.



This case study focuses on Watch Water's approach towards the development of and innovative as well as cost effective treatment process for petrochemical waste using very advanced oxidation processes (VAOP). Due to a non-disclosure agreement, the specific site location cannot be mentioned; nonetheless, the case study will describe Watch Water's approach, technological breakthroughs, and the environmental and economic benefits obtained by our product.

## INTRODUCTION

The petrochemical industry plays a crucial role in world economy, as a plethora of goods come from petroleum or natural gas. These goods are critically important for industries like manufacturing, construction, pharmaceuticals, agriculture, transportation, etc. At the same time, petrochemical industry has tremendous difficulties when it comes to wastewater treatment. The complex and persistent organic chemicals found in petrochemical effluent make typical treatment procedures ineffective.

Wastewater in the petrochemical industry typically contains various pollutants, including organic compounds, heavy metals, suspended solids, oils, and grease. Treatment procedures are implemented to reduce the environmental impact of petrochemical effluent, which may involve physical, chemical, and biological processes, either individually or in combination, depending on the unique characteristics of the wastewater.

Physical treatment procedures include sedimentation, filtration, and flotation for the removal of suspended particles, oils, and grease. Aerobic/ Anaerobic microorganisms are used in biological treatment methods to biodegrade organic chemicals found in wastewater. Chemical treatment techniques make use of a variety of chemicals to aid in the removal or transformation of contaminants. Coagulation, flocculation, oxidation, and pH correction are examples of such processes.

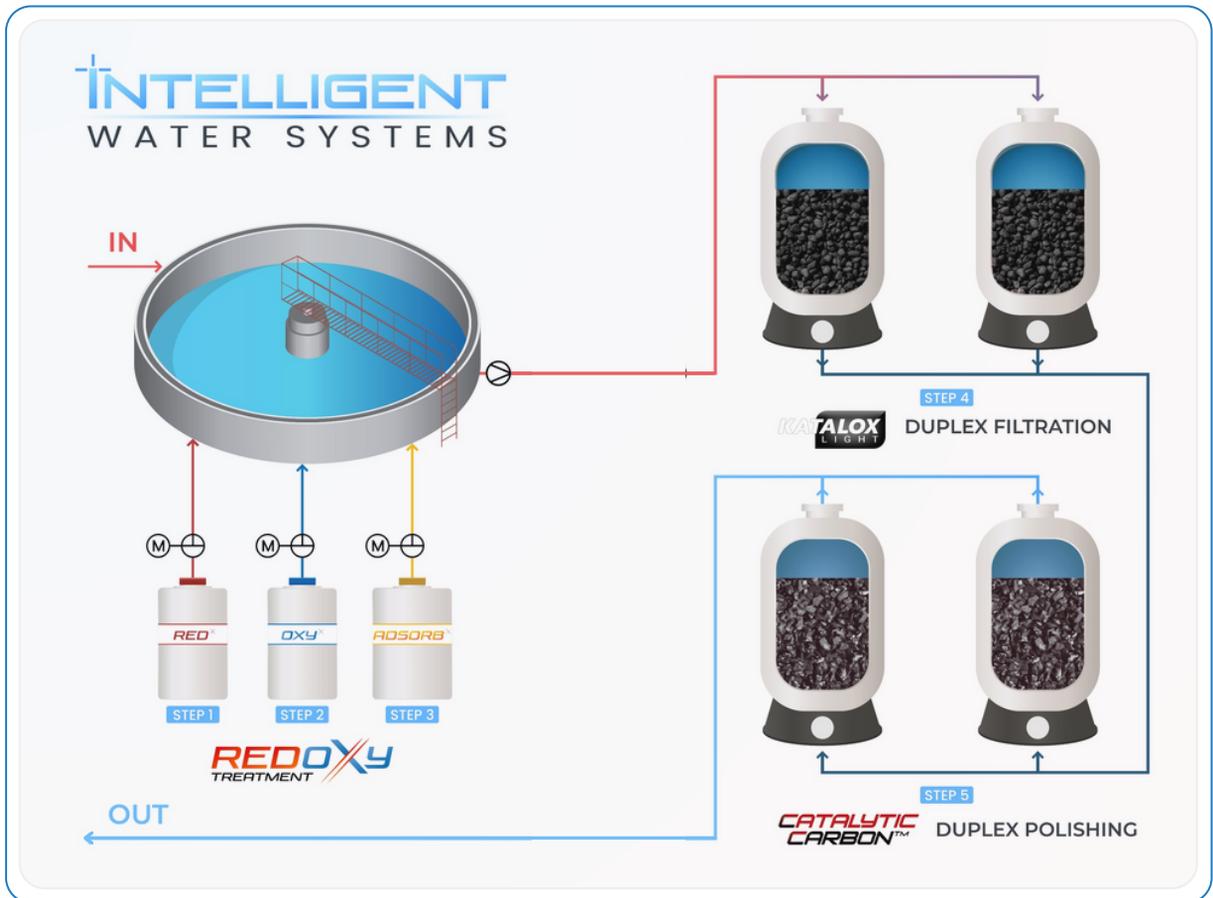
**BEFORE**



**AFTER**

The complex and persistent organic chemicals found in petrochemical effluent make typical treatment procedures ineffective. To address these problems, Watch Water, after thorough research developed a five-stage purification process including Catalyst, Coagulation, Oxidation, Adsorption and finally Polishing. The whole process is called **REDOXY VAOP**.

## REVOLUTIONARY 5 STEP WASTEWATER TREATMENT PROCESS



### WHAT IS REDOXY VAOP?

Our Very Advanced Oxidation process (VAOP) utilize the power of **Hydroxyl (OH<sup>•</sup>) & Sulphate (SR<sup>•</sup>) radicals and Ferrate (VI) ions**. Ferrate (VI) is the most powerful oxidizing agent, but it is very unstable. Hence it couldn't be adapted by our client previously. Watch Water, through its ground-breaking invention, stabilized the Ferrate (VI) in the most stable and preservable granular form called **Red<sup>x</sup>**. **Red<sup>x</sup>** in combination with a strong acid halogen (**Oxy<sup>x</sup>**) produce enough **Hydroxyl (OH<sup>•</sup>) & Sulphate (SR<sup>•</sup>) radicals and Ferrate (VI) ions** to generate an oxidation potential of up to **8.0 V**. This high oxidation potential cannot even be measured and hence 'Very Advanced Oxidation process'.

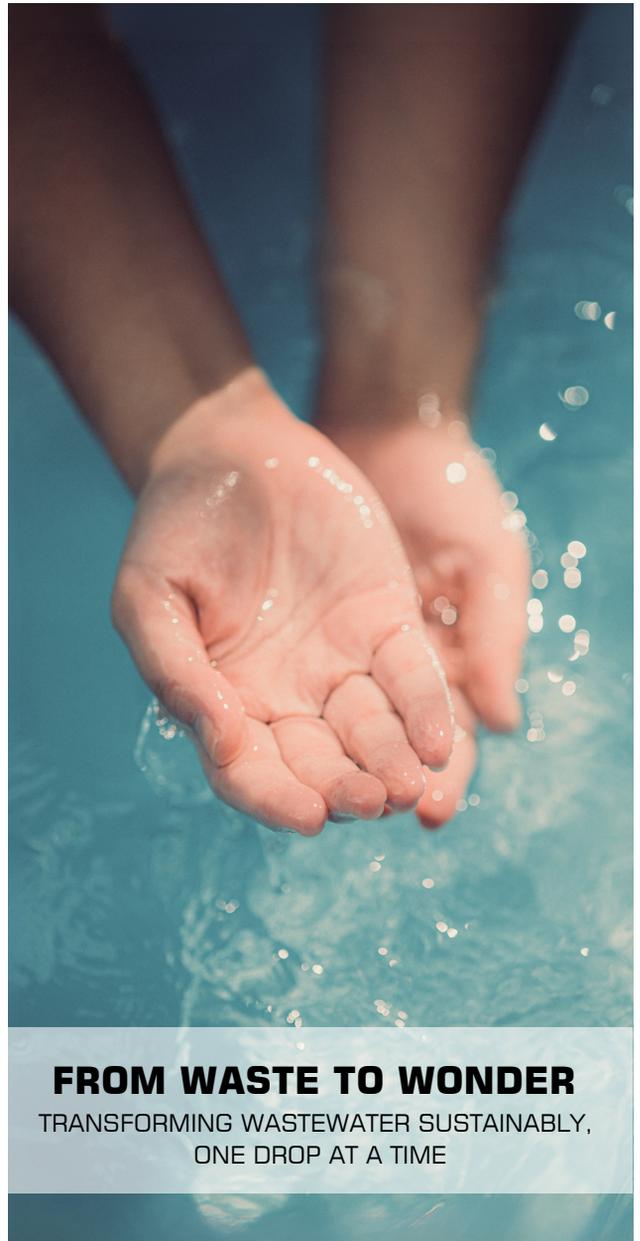
### SOLUTION OVERVIEW

**REDOXY VAOP** is a proprietary water treatment technology which basically combines oxidation, adsorption, and filtration technology in a single system. For our client, a five-step purification process was developed using **Red<sup>x</sup>**, **Oxy<sup>x</sup>** and **Adsorb<sup>x</sup>** in particular dosing amounts. These chemicals were mixed with the wastewater in the centrally placed contact reaction tank. Finally, for final filtration and polishing, the water passes through **Katalyst Light** filtration unit and **Catalytic Carbon** polishing unit.

## ENVIRONMENTAL AND ECONOMIC RESULTS

The implementation of the **Watch Water's REDOXY VAOP** system for treating petrochemical wastewater resulted in significant environmental and economic benefits:

- Efficient Contaminant Removal: The AOP technology removed organic pollutants at a high rate, resulting in cleaner wastewater and a lower environmental impact.
- Compliance with regulations: Our client was able to effectively treat their petrochemical wastewater, avoided penalties by ensuring compliance with severe environmental rules in their country.
- Resource Recovery: The **REDOXY VAOP** system recovered valuable resources from wastewater, such as organic acids or biofuels, which could then further be used or sold to generate additional revenue streams.
- Operational Cost Savings: Our **VAOP** system is designed to maximize energy efficiency while lowering operational costs and enhancing profitability.



### **FROM WASTE TO WONDER**

TRANSFORMING WASTEWATER SUSTAINABLY,  
ONE DROP AT A TIME

## **CONCLUSION**

**Watch Water's REDOXY VAOP** system provided an effective solution for treating petrochemical wastewater, addressing the challenges faced by the industry. Through their innovative technology and commitment to sustainability, the undisclosed company has established itself as a leader in the field of petrochemical wastewater treatment, delivering environmental benefits and economic value to their clients while maintaining confidentiality and respecting non-disclosure agreements.

### **WATCH WATER GMBH**

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