Widening of technical infrastructure CIP Zeitz with WEDECO Ozone System

The wastewater of the chemical and industrial park Zeitz, Germany contains persistent COD that is mainly discharged from an oil refinery complex situated at the site. The existing biological treatment in combination with activated carbon was not able to eliminate the pollutants effectively to meet legislative requirements. The solution was the installation of a WEDECO Ozone Oxidation System which makes the persistent contaminants biologically available.

Client Background

Providing infrastructure service on the chemical and industrial park Zeitz, Infra-Zeitz Servicegesellschaft mbH & Co. KG is the competent partner of investors and residents. Infra-Zeitz guarantees the resident companies an appropriate supply of all the media required for their production processes, and operates a state-of-the-art extendable biological wastewater plant for disposal of industrial wastewater.

Project Motive

To meet the legislative requirements of the wastewater treatment on site, an ozone oxidation installation was necessary in addition to biological treatment steps. Overall aim of this ozonation stage is to make the persistent COD (Chemical Oxygen Demand) present in the wastewater biologically available. This enables the client to add a biological post treatment and furthermore reduce significantly the amount of aromatic hydrocarbons. The off gas escaping from the oxidation stage is used to support the aeration of the downstream biology.

Project Details

The ozone plant consists basically of the components ozone production, ozone dissolution in wastewater, ozone reaction and degassing tank, air cooled chiller unit and residual ozone destruction. The WEDECO

Application:
Wastewater Treatment Plant of the chemical and industrial park Zeitz, Germany

Overall aim:
Making the persistent COD present in the wastewater biologically available to meet COD discharge limits

Expertise Supplier:
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ozone system was completely installed and tested by Xylem inside a specially adopted container which reduced on site installation and commissioning to a minimum. Infra Zeitz decided for this containerized solution since there was no adequate space for housing of the equipment available and fast track execution was mandatory. The ozone system of the type WEDECO PDO 2500 is designed for producing up to 35 kg/h from LOX at an ozone concentration of 179 g/m3 (NTP) (=12wt%) and treating big flows of wastewater per day. The production of ozone is regulated automatically depending on the amount of raw water and level of pollution (scope of regulation: 1 – 100%), so that a maximal energy conservation is achieved. The ozone is made of oxygen from liquid oxygen (LOX)

storage. After vaporisation the gaseous oxygen is fed into the ozone generator to form ozone.

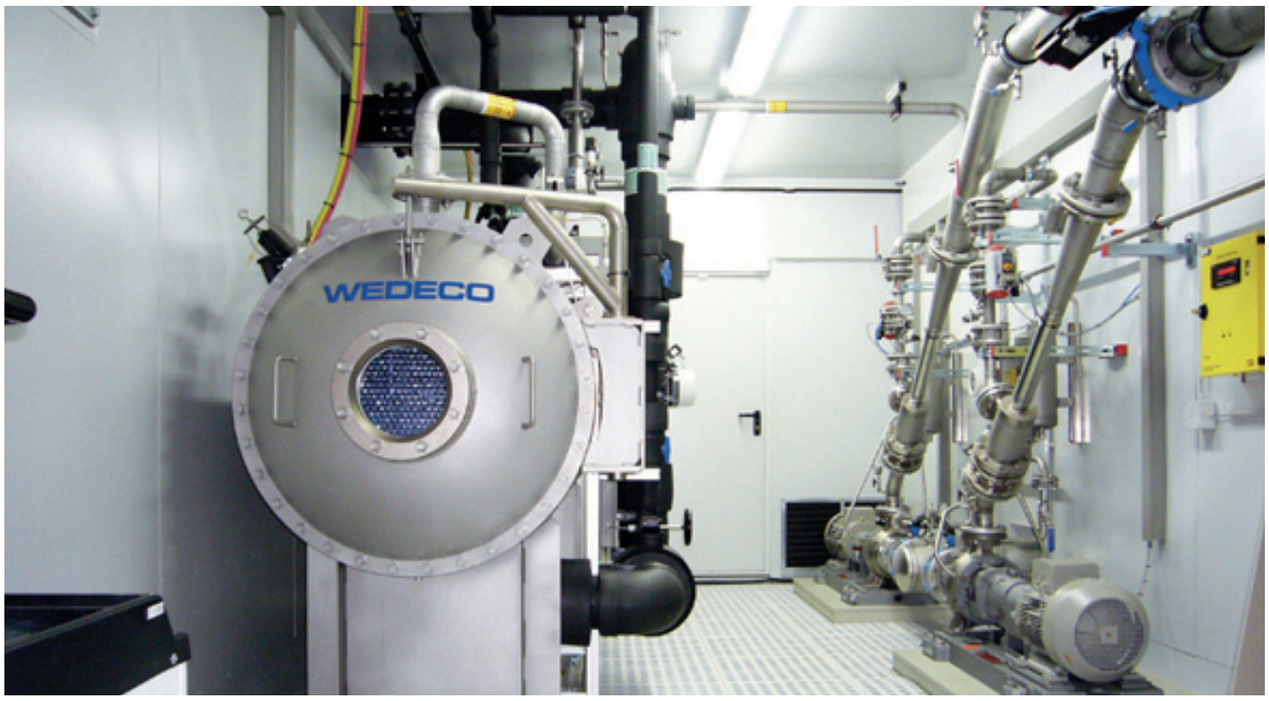
For efficient ozone dissolution in the wastewater a pump-injection-system followed by pressurized reaction tank was chosen. The raw water enters directly into the oxidation loop prior to the reaction tank. At this point the wet-chemical reaction of ozone and substances in the wastewater takes place. The off gas of the oxidation stage is used to support the aeration of the downstream biology. To prevent the introduction of residual ozone, an ozone destructor is treating the off gas from the reaction tank. The water cooled chiller unit cares for the required cooling. External cooling water become redundant.

All process parameters are internally controlled and monitored through a PLC-system that also serves as an interface to the clients SCADA system. All parametres are monitored and can be controlled by remote access through a build-in modem connection.

Project Economics

The earlier dosage of powdered activated carbon coal proved not to be effective enough to eliminate the pollutants in the wastewater. Additionally, its handling was also troublesome for the operators. The new installed automatic operating ozone system now assures the operators to meet safely the discharge limits while simultaneously the manpower to operate and maintain the system and the specific treatment costs are significantly reduced.

The ozone plant consists basically of the components ozone production, LOX storage tank, ozone dissolution in wastewater, ozone reaction and degassing tank, air cooled chiller unit and residual ozone destruction.



The WEDECO PDO 2500 Ozone Generator (left) and the pump-injection-system are housed in an insulated container, perfectly fitted for the installation of a large scale ozone system. This completely preassembled system reduces onsite installation effort and makes concrete housing redundant.

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