



# Water System

BY LÖSUNG



# MBR-3C

MEMBRANE BIOREACTOR WITH *REDOXY-3C*

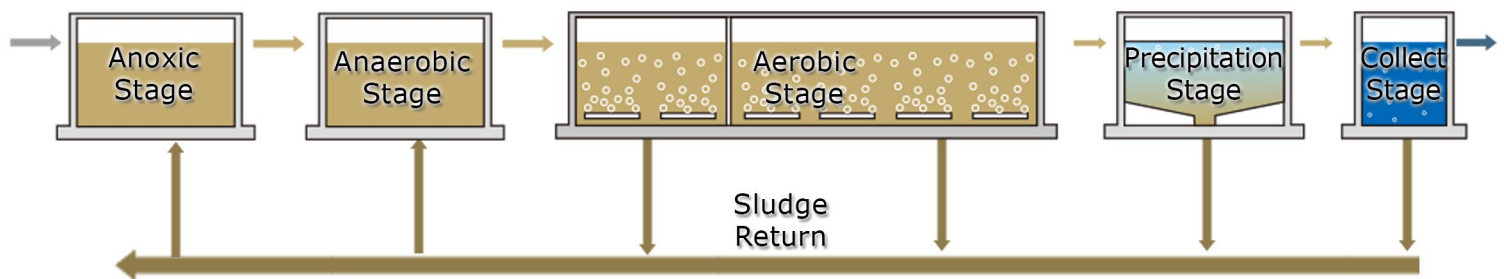
**Tö Water System** And **WATERCHER** has many years of experience as a global provider of industrial water treatment solutions.

Increasing pressure from population growth, changing weather patterns, and pollution are all contributing to a growing situation of water scarcity.

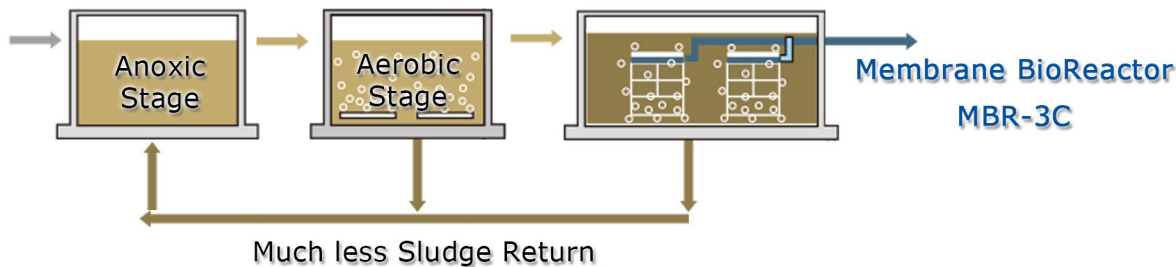
The **Modular compact Membrane BioReactor MBR-3C** system with the **Redox 3c** treatment from **WATERCHER** Germany can help you to meet these challenges.

## HOW DOES THE MBR PROCESS WORK?

Conventional activated sludge wastewater treatment  $COD \leq 900\text{mg/L}$ ,  $BOD5 \leq 200\text{mg/L}$ ,  $SS \leq 200\text{mg/L}$



MBR-3C system wastewater treatment  $COD \leq 50\text{mg/L}$ ,  $BOD5 \leq 10\text{mg/L}$ ,  $SS \approx 0\text{mg/L}$

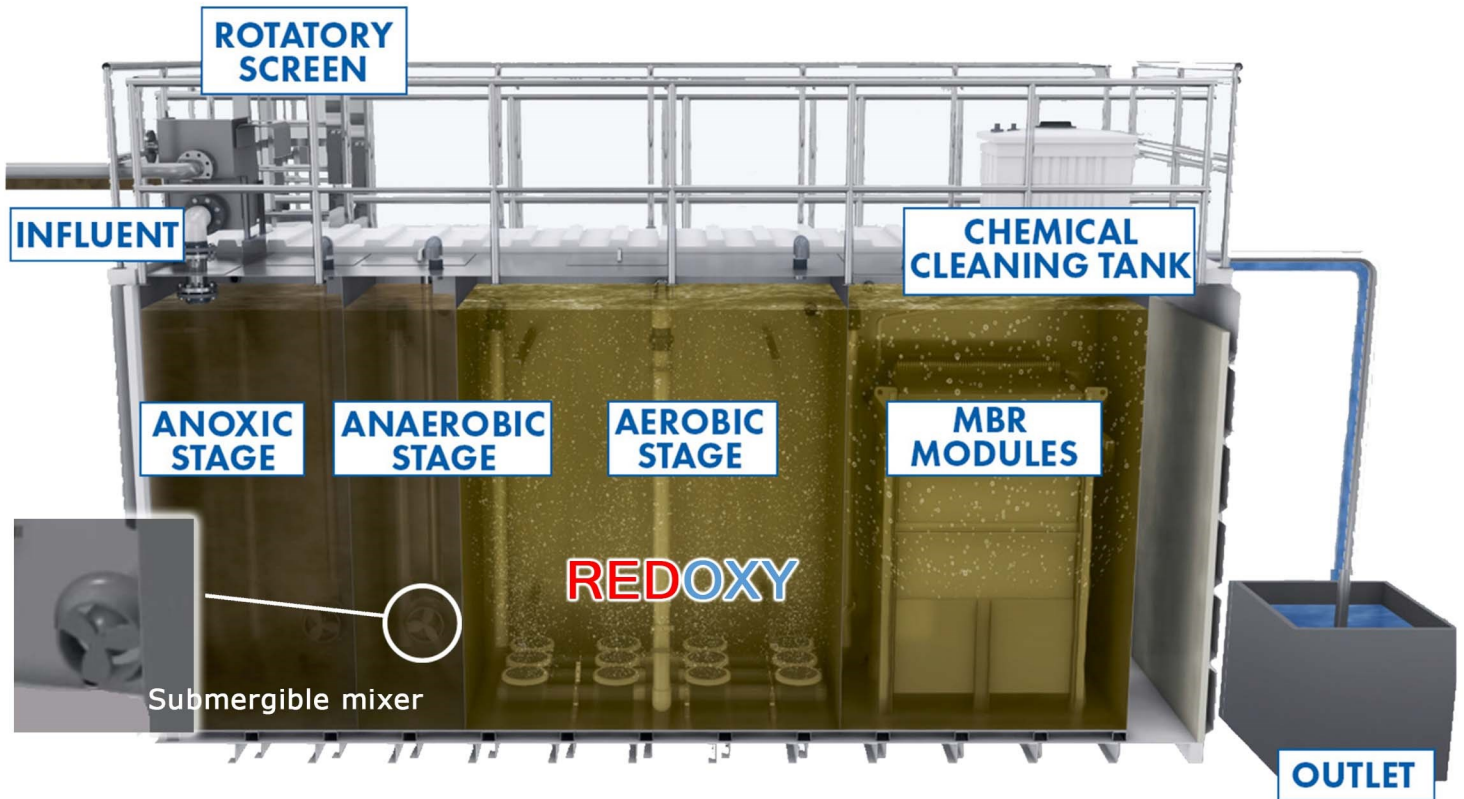


## BENEFITS OF MBR-3C VS TRADITIONAL WASTE WATER TREATMENT

The MBR-3C system has a number of advantages over Conventional Activated Sludge (CAS) waste water treatment.

- ✓ **Smaller Footprint** – By removing the need for a clarifier and thanks to the higher sludge concentrations possible with MBR, bioreactor tank volumes can be reduced by up to 50% versus CAS systems.
- ✓ **Less Sludge** - The ability to hold higher concentrations of MLSS and having longer sludge residence times allows the MBR to produce less sludge than conventional activated sludge systems.
- ✓ **High Effluent Quality Suitable For Reuse** – the flat sheet membranes used by **Tö Water System** have a pore size of just  $0.15\ \mu\text{m}$  resulting in clear, highly purified effluent. As a result the effluent can be suitable for reuse or further treatment by other **Tö Water System** technologies like reverse osmosis.
- ✓ **Reduced Operator Input** – the simpler process without the clarifier stage reduces the need for operator checks and adjustments.
- ✓ **High Stability** – the MBR process is stable across a range of conditions and can manage high levels of variability.





A typical MBR system is made up of the following components:

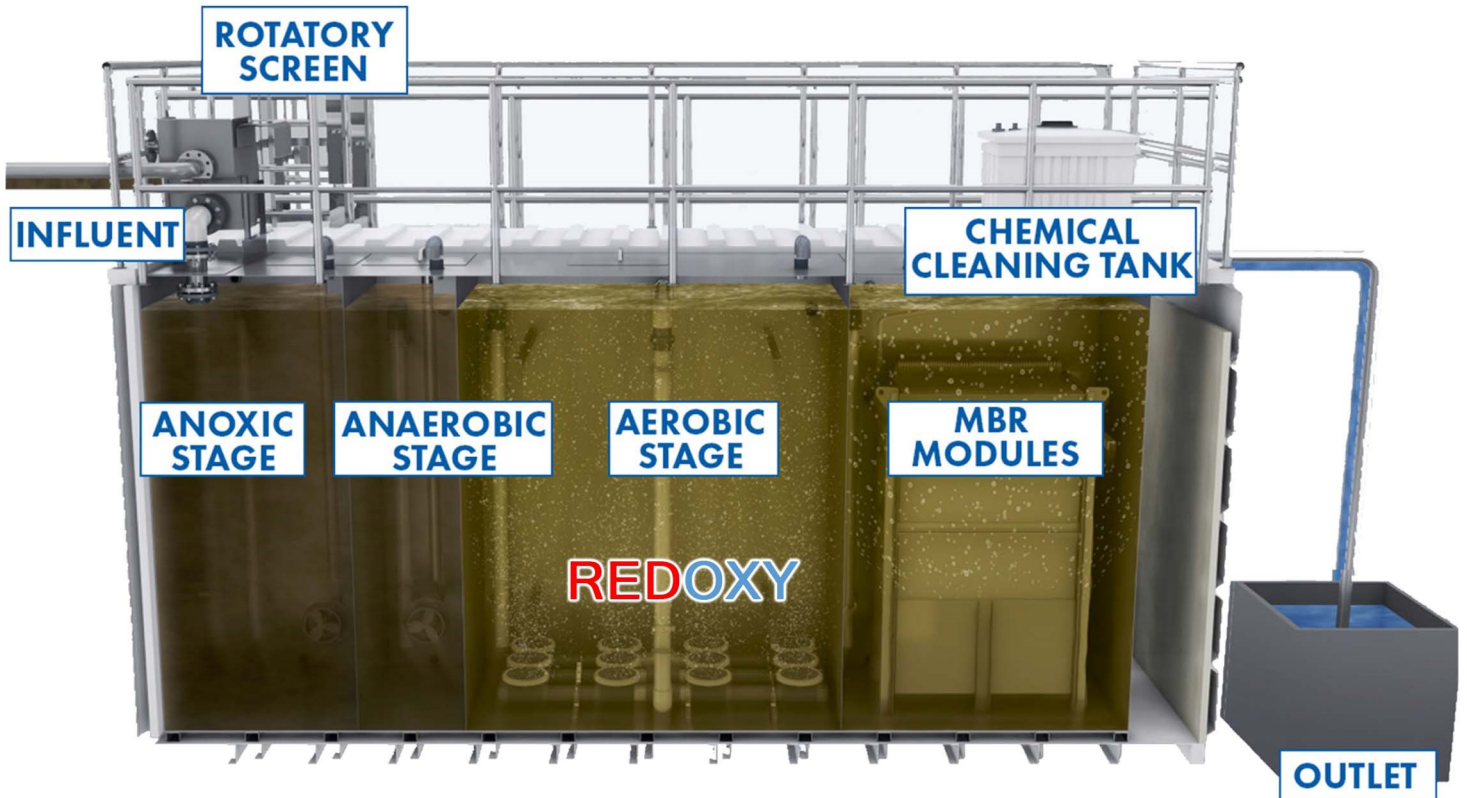
- Rotator influent screen
- Anoxic, anaerobic tanks for biological treatment
- *REDOXY-3C* tank for Oxidation, Disinfection, Coagulation, and Adsorption
- MBR modules and MBR tank
- Air blowers for the aeration process and for membrane scouring
- Pump set for the MBR permeate suction and for sludge recirculation
- Cleaning tank for periodic chemical enhanced backwash of the MBR membranes

## Rotatory screen

The first step of the treatment process is mechanical screen of incoming water. The screened water flow in to the anoxic tank.

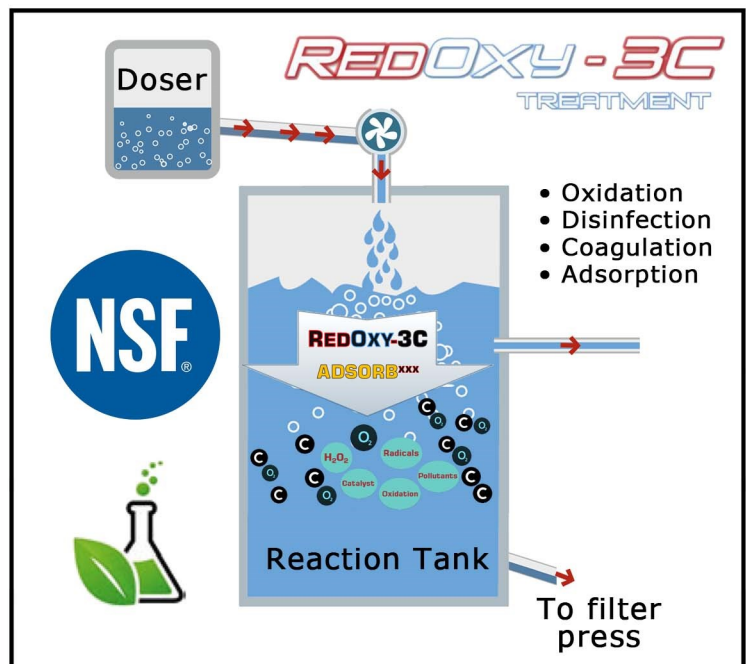
## Anoxic and Anaerobic Stage

Within the anoxic tank the submersible mixer blend the screened waste water with mix liquid flow return from MBR tank to achieve the desire level of the denitrification in the absent of dissolve oxygen. Nitrate is convert in to nitrogen gas in the tank. From the anoxic tank mix liquid flow to the anaerobic tank. The anaerobic process trigger the discharge of Phosphate by micro Bacterial in the anaerobic stage reaction.



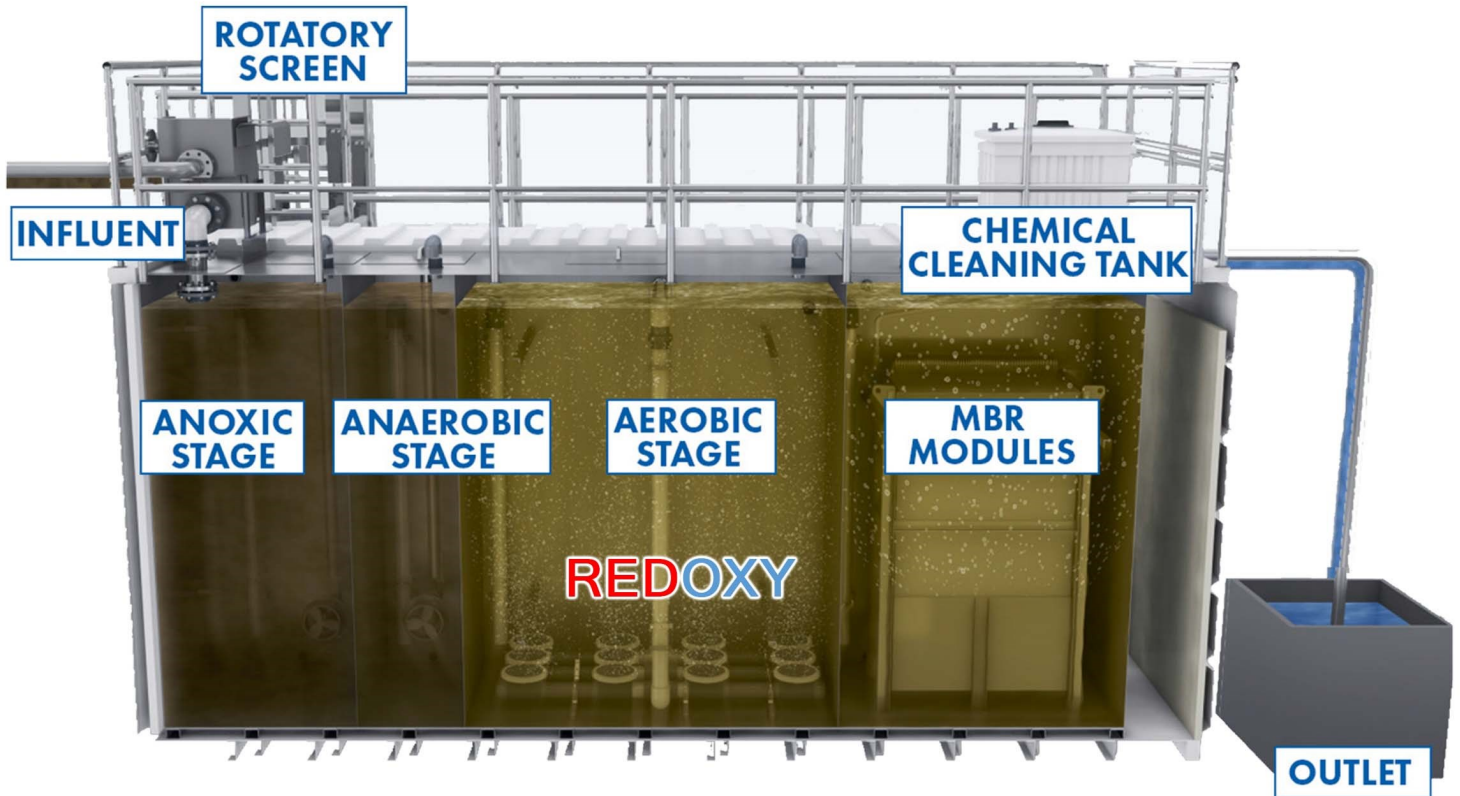
## Advantages

- Rapid decrease of **BOD & COD**
- Dissolved oxygen rapidly increase
- **Inexpensive** and helps to reduce the cost of wastewater treatment
- Intensive **biodegradation** process
- Releasing **oxygen** day and night over long period of time
- Elimination of **hydrogen sulfide** and **ammonia**
- Improves **water quality**
- Once settle to the bottom of any **water tank**, an immediate increase in the sludge biodegradation.
- Using *OXY* will effectively kill **Pathogenic** bacteria
- Staphylococcus aureus and **Escherichia coli** will be **destroyed 100%**
- Simple, easy to use, safe and most effective way to produce **oxygen micro-bubbles**
- Achieving **rapid** sterilized **oxygen**



**WATCHER** *REDOXY-3C* technology works by using **oxygen** to transfer biotechnology to deliver oxygen to a biofilm attached to the high surface of *REDOXY* beads. Immersing *REDOXY* beads on sludge surfaces increases the population of biomass in the water treatment system. This immediately intensify the **biological treatment** process. Oxygen is delivered to the sludge by diffusion through the *REDOXY* which reduces the energy required for oxygen delivery by up to 100 times compared to all conventional aeration systems.





## Advantage

- Space saving
- MBR is capable of meeting the most stringent effluents water quality standard.
- Improve water quality
- Potential for water reuse
- Standard installation
- Containerized plants
- Microfiltration or Ultrafiltration, to produce effluent with very low solids ( $SDI < 3$ ) makes them well suited as RO pre-treatment.
- The cumulative advantages of MBR are increasingly translating in to lower total installed cost as compared to conventional activated sludge
- Retrofit of existing plants allows expansion and upgrade of existing facilities up to 3-5 times existing capacity

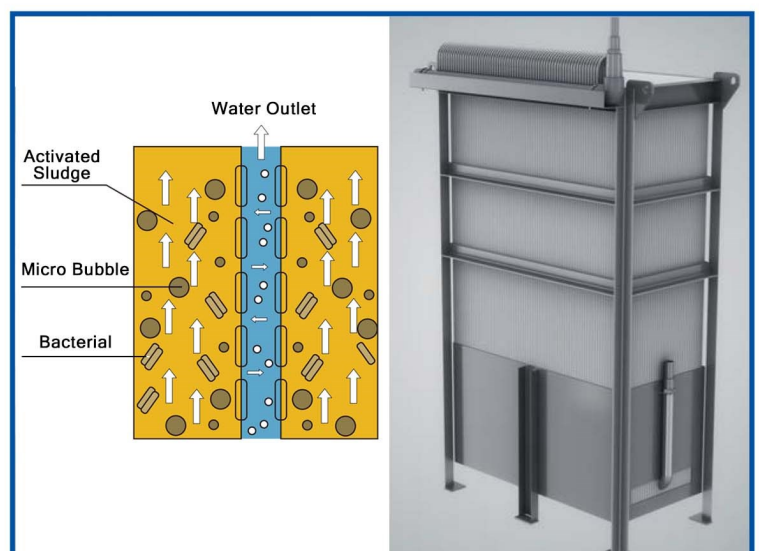
The **MBR membrane** is the heart of the treatment process.

**The flatsheet MBR membrane modules** are fully submerged in the mixed liquor inside the tank for direct outside to inside filtration.

The modules are made of robust reinforced flatsheet membranes with a nominal pore size of just  $0.15\mu m$ . This produces **high quality** effluent suitable for reuse applications.

## How it works

## Membrane Bioreactor



## Specifications

System Specifications	5 m <sup>3</sup> /DAY	10 m <sup>3</sup> /DAY	15 m <sup>3</sup> /DAY	25 m <sup>3</sup> /DAY	50 m <sup>3</sup> /DAY	100 m <sup>3</sup> /DAY
Nominal Capacity At Water Temp 20°C	5-7m <sup>3</sup> /DAY	10-14m <sup>3</sup> /DAY	15-22m <sup>3</sup> /DAY	25-37m <sup>3</sup> /DAY	50-72m <sup>3</sup> /DAY	100-145m <sup>3</sup> /DAY
MBR Membrane Area	20 m <sup>2</sup>	40 m <sup>2</sup>	60 m <sup>2</sup>	100 m <sup>2</sup>	200 m <sup>2</sup>	400 m <sup>2</sup>
<i>RED OXY-SC</i> Dosage	5-30 mg/m <sup>3</sup>					

## TYPICAL APPLICATIONS

- ✓ Commercial sites, such as shopping malls, hotels/resorts, and sports centers
- ✓ Military and relief aid camps
- ✓ Small municipal communities
- ✓ Food & Beverage , chemical & pharmaceutical industries
- ✓ Sites that require upgrading to meet more stringent discharge quality levels

Typical MBR Performance	Unit	Influent	Remove Efficiency	Effluent
Total Suspended Solids TSS	mg/L	6000-12000	>99.9%	<3
BOD	mg/L	<5000	>90%	<25
COD	mg/L	<10000	>95%	<25
Total Nitrogen T-N	mg/L	No requirement	>85%	<10
Total Phosphorus T-P	mg/L	No requirement	>80%	<2

# Water Quality Association Gold Seal Certificate

**Watch Water GmbH**

Fahrlachstrasse 14

Mannheim, Germany

Facility: Watch GmbH

Certification Date: April 16, 2018

Authorized By: *Caren L. Settler*

Caren L. Settler  
Product Certification Manager

Water Quality Association  
4151 Naperville Road  
Lisle, IL 60532, USA



#0633  
ISO 17065  
Product Certification Body



Revision: 10/25/2017

FORM.12046

This Certificate, or any part thereof, may not be used in a misleading manner and validation of its use is contingent upon the Official WQA web-listing.

## Water Quality Association Official Gold Seal Listing

Granted to the following company:	Watch Water GmbH Fahrlachstrasse 14 Mannheim, 68165 Germany
For the Facility Located at:	Watch GmbH Fahrlachstrasse 14 Mannheim, 68165 Germany

The WQA Gold Seal Certification Department has issued certification for the following model(s) to the standard(s) below. Only models that appear in the official listing are authorized to bear the WQA Gold Seal.

### NSF/ANSI 60 - 2017: Drinking Water Treatment Chemicals - Health Effects

ADSORBx	INSTANT ISOFT	INSTANT ISOFT DW
INSTANT ISOFT OB	INSTANT ISOFT ON	INSTANT ISOFT OV
INSTANT ISOFT OXYDES	INSTANT ISOFT RO	INSTANT ISOFT ROB
OXYSORB	OXYx	REDOXY-3C
REDx		

### NSF/ANSI 61 - 2016: Drinking Water System Components - Health Effects

Catalytic Carbon	FILTERSORB CT	Filtersorb IR
Filtersorb SP3	Katalox Light	Katalox Light Plus



# AQUIN

by  Water System

MADE  
IN  
GERMANY

## Ultimate Invention In Waste Water Treatment

**REDOXY-3C**  
TREATMENT



No Chlorine



No Flocculent/Alum



No DBPs



No Acids



No Ozone



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