STERAPORE™ 5000 Series

HOLLOW FIBER MEMBRANE MODULE STERAPORE

Water recycling plant in China

CASE 01

Location
China

Furnished by
Beijing Origin Water Technology Ltd.

Capacity
45,000m³/d

Application
Domestic Sewage

Operation started
2006

Product
STERAPORE™ 5000

Challenge

As water shortage in urban areas in China is becoming a serious problem due to growing population in such areas, effective use of treated water is needed as a countermeasure to solve this problem.

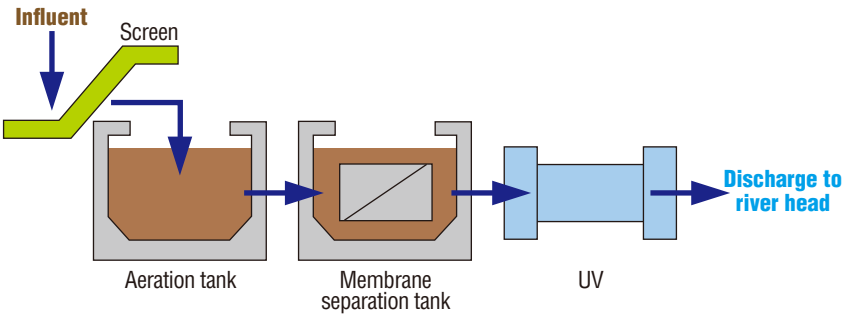
Solution

The purpose of this treatment system is reuse of the treated water, allowing the treated water to be discharged into the upstream of the dam. To this end, MBR that can cut off SS almost 100% to obtain excellent water quality has been used.

Benefits

The sewage treated water by SBR(Sequencing Batch Reactor) is treated by MBR(Membrane Bio Reactor) and then being discharged into the dam serving as a water supply resource.

Process flow diagram



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Sewage treatment plant in Korea

CASE 02

Location
Korea

Furnished by
Hyundai Engineering Co., Ltd.

Capacity
30,000m³/d

Application
Domestic Sewage

Operation started
2008

Product
STERAPORE™ 5000

Challenge

This plant is located near Seoul, a growing megacity with a population of over 10 million, and its treatment capacity needs to be increased from 150,000 to 180,000m³/day; however, there is not enough land space.

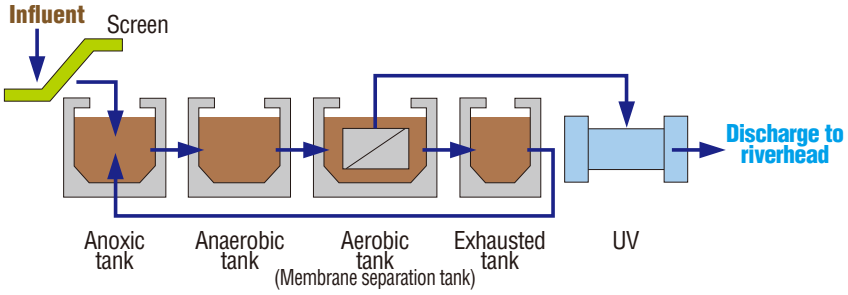
Solution

A significant land-saving is a critical factor for this project. Membrane Bio-Reactor (MBR) can reduce about 60% land space compared with conventional activated sludge process because MBR can eliminate a secondary clarifier.

Benefits

MBR makes it possible to utilize the limited land. Also, the MBR treated water can be discharged to riverhead for improvement in the quality of river water.

Process flow diagram



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HOLLOW FIBER MEMBRANE MODULE STERAPORE

Industrial water recycling plant in Japan

CASE 03

Location
Japan

Capacity
720m³/d

Application
As a part of production facility

Operation started
2010

Product
STERAPORE™ 5000

Challenge

Need to reduce industrial water quantity as part of the client's CSR programs.

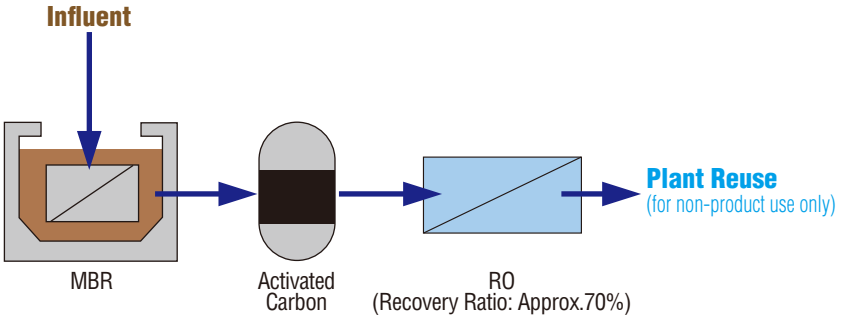
Solution

Reuse a part of the treated water for CIP makeup water and beer bottle container washing using reclaimed water from production lines with Membrane Bio-Reactor (MBR) and Reverse Osmosis (RO) technologies.

Benefits

Lower the client's water and wastewater bills in addition to contribution to their CSR activities.

Process flow diagram



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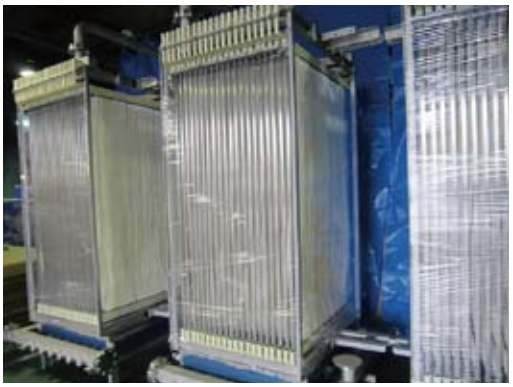
Do more with less upgrade of existing MBR

CASE 04



Location
Japan

Furnished by
Atakadaiki Engineering Co., Ltd.

Designed Capacity
420m³/d

Application
Domestic Sewage

Year Operation Started
2011

Product
STERAPORE™ 5000

Challenge

The initially installed MBR system equipped with a flat-sheet membrane was operated at a water flux rate higher than normal to process the influent more than originally planned. This situation brought an unstable MBR system operation such as frequent chemical cleanings and membrane replacements in a shorter period than expected. Therefore, a retrofit of this MBR system with the minimum CAPEX to realize a stable operation and minimize OPEX was highly anticipated.

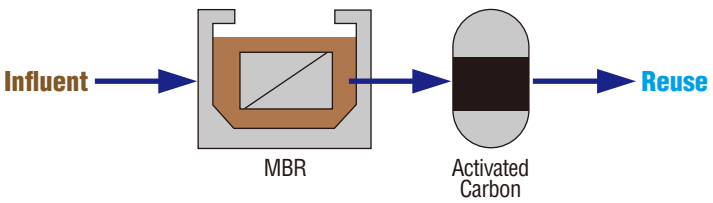
Solution

Replace the flat-sheet membrane module with the STERAPORE™ hollow-fiber membrane module to increase the membrane surface area per footprint to secure a sufficient influent treatment capacity without a tank and blower expansion

Benefits

Through the membrane replacement, the MBR system has gained more capacity under operation at an appropriate water flux rate accompanied by the following cost saving:
CAPEX: No membrane tank and blower capacity expansion
OPEX: Less membrane maintenance and replacement

Process flow diagram



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Industrial wastewater treatment plant in Korea

CASE 05

Location
Korea

Furnished by
CJ Korea Express Co.

Capacity
1,000m³/day

Application
Industrial Wastewater (Dairy Plant)

Operation started
2008

Product
STERAPORE™ 5000

Challenge

Reduce or eliminate sludge carry-over to the final effluent dealing with significant fluctuations in the inlet water composition.

Solution

Retrofit the existing conventional activated sludge process with Membrane Bioreactor (MBR) featuring the Mitsubishi Rayon hollow fiber membrane.

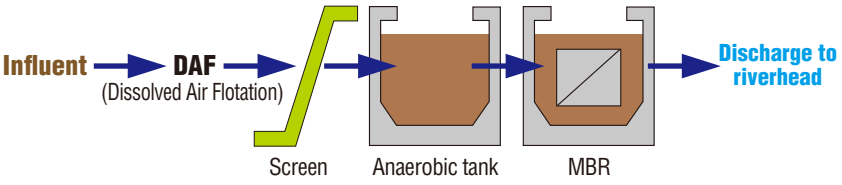
Benefits

Realize hassle-free STP operation and maintenance while getting the better quality final effluent especially in terms of BOD and SS.

Water analysis

		Influent	DAF treated water	MBR treated water
pH		5-10	5-10	**5-10**
BOD_5	mg/L	1,500	500	**<2**
COD_{Mn}	mg/L	600	220	**<10**
SS	mg/L	800	200	**<1**
T-N	mg/L	100	49	**<5**
T-P	mg/L	30	14	**<1**
n-H	mg/L	30	10	**<5**

Process flow diagram



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HOLLOW FIBER MEMBRANE MODULE STERAPORE

Wuxi Xincheng wastewater treatment plant

CASE 06

Location
Jiangsu Province, China

Furnished by
Jiangsu Origin Water Technology Co., Ltd.

Capacity
30,000m^3/day

Application
Sewage (30% of Domestic Wastewater and 70% of Industrial Wastewater)

Operation started
2011

Product
STERAPORE™ 5000

Challenge

On June 5, 2008, the newly revised Taihu Lake Water Pollution Prevention Regulation was brought into effect. However, the footprint of this facility was too small to comply with the stringent regulation by increasing of the existing conventional activated sludge process capability without overloading.

Solution

Apply membrane bioreactor (MBR) to meet the effluent standard with the limited land.

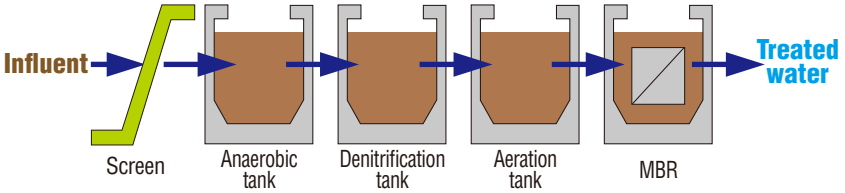
Benefits

Compliance with the standard with no overload concern and less manual operation.

Water analysis

		Influent	Treated water
COD_{Cr}	mg/L	360	**33.2**
SS	mg/L	400	**<5**
T-P	mg/L	5	**0.3**
NH_3-N	mg/L	38	**1.3**
T-N	mg/L	43	**11.1**

Process flow diagram and water quality



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Petrochemical plant wastewater recycling

CASE 07

Location
Ningbo, China

Furnished by
Mitsubishi Chemical Engineering Co.

Capacity
6,000m³/day

Application
Petrochemical Plant Wastewater

Operation started
2012

Product
STERAPORE™ 5000

Challenge

- Reuse purified terephthalic acid (PTA) plant wastewater as cooling tower makeup to reduce the environmental load associated with effluent disposal and to cut the water bill
- Install all the membrane modules in the existing 10 meter depth tank without a shutdown of the WWTP

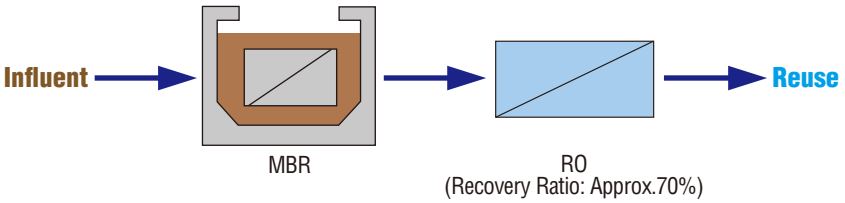
Solution

- Retrofit of the existing WWTP with an MBR-RO system to obtain reusable water for the purpose
- Use of the existing beam to hang membrane modules to eliminate the guide pipe foundation work which requires a WWTP shutdown

Benefits

- Reuse up to 70% of the wastewater (4,200m³/day) as cooling tower makeup
- No WWTP downtime

Process flow diagram



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Industrial WWTP upgrade in Japan

CASE 08

Location
Hiroshima, Japan

Furnished by
Nippon Rensui Co.

Capacity
2,000m³/day

Application
Industrial Wastewater

Operation started
2013

Product
STERAPORE™ 5000

Challenge

Increase the processing capacity of the existing WWTP by 68.5% without footprint expansion

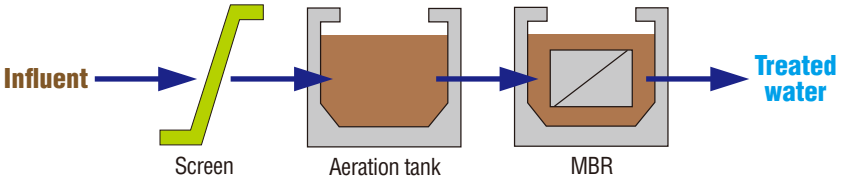
Solution

Installation of an MBR system through the use of one of the existing aeration tanks to boost the WWTP capacity with no overload, additional settling tank

Benefits

The target was successfully achieved having an extra 25% MBR capacity for future expansion

Process flow diagram



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Electronics industry wastewater treatment plant in Vietnam

CASE 09

Location
Vietnam

Furnished by
Goshu Kohsan Co., Ltd.

Capacity
500m³/day

Application
Electronics Industry Wastewater

Operation started
2012

Product
STERAPORE™ 5000

Challenge

This facility is located in a industrial park, Vietnam.
Need to construct the integrated wastewater treatment facility in the industrial park due to lack of capacity. Treated water directly discharge to the river. The criteria is BOD＜24mg/L, COD＜41mg/L.

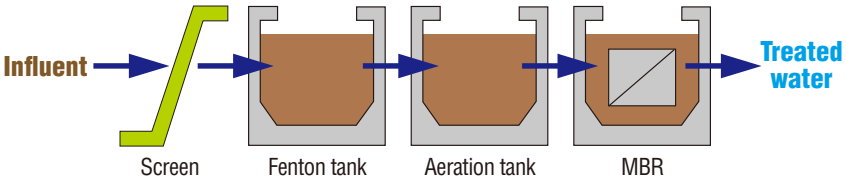
Solution

A treated water high quality is a critical factor for this project. Membrane Bio Reactor (MBR) can adhere the strict effluent standards of this river.

Benefits

The treated water by MBR directly discharge into the river for protecting the environment.

Process flow diagram



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High COD effluent treatment at a chemical plant

CASE 10

Location
Japan

Furnished by
Swing Corporation

Maximum Capacity
700m³/day

Application
Chemical Wastewater

Operation started
2012

Product
STERAPORE™ 5000

Challenge

The raw wastewater is mixed effluent from chemical and pharmaceutical plants.
The wastewater treatment facility cannot stop because the plant is running all year.
The existing settling tank agitator has damaged by aging facility.

Solution

Without stopping the existing facilities, adding a membrane tank, remodifications were carried out. Membrane Bio-Reactor (MBR) was been equipped.

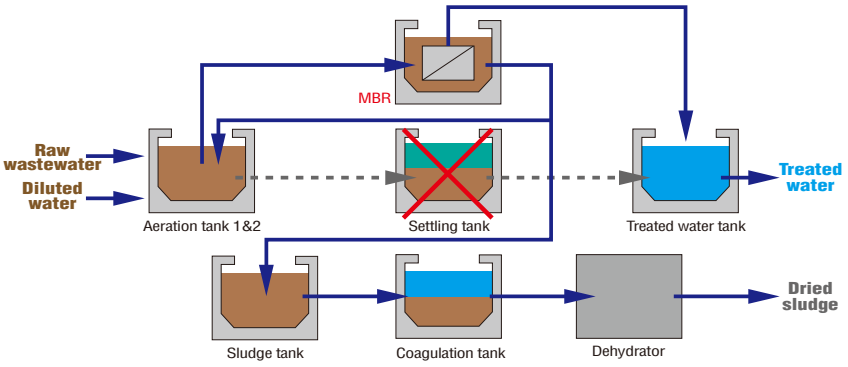
Benefits

MBR does not require settling tank and it also raised load. The water quality of the MBR process is very good and stable. Our client said that 'wastewater treatment by MBR is the best choice' .

Water analysis

		Raw wastewater	Diluted wastewater	MBR treated water
Flow	m³/h	4.0 (2.5～8.0)	16	—
COD	mg/L	8,000 (1,000～15,000)	2,000	**4.9**
T-N	mg/L	500 (0～1,000)	125	—
pH		8.0 (6.5～9.0)	8.0	—
SS	mg/L	—	—	**1.2**

Process flow diagram



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