

# CASE STUDY

RO | UF | MBR |

Wastewater Treatment  
Rayong, Chonburi  
Thailand



## Toray's Low-Fouling Reverse Osmosis Technology Keeps Replacement Costs Down at Wastewater Reuse Plants in Thailand

### BACKGROUND

The Amata Corporation is an industrial real estate developer managing properties primarily in Thailand but also in Vietnam. Between two business parks in Chonburi and Rayong, Thailand, there are more than 500 factories and 1,100 manufacturers operating at these sites, including Fortune 500 companies such as Toyota, Nestle, BASF, and Sony. The continuous supply of clean water is essential for sustaining these businesses and surrounding communities.

Amata Water, a fully-owned subsidiary of Amata Corporation Public Company Limited, manages water treatment and distribution. Amata Water operates under the mission of continually developing products and services for the tenants of Amata while providing sufficient and sustainable water resources, purification systems, and wastewater treatment systems, with a particular aim toward environmental conservation.

The designated engineering firm and Build-Operate-Transfer (BOT) contractor for the water treatment plants (WTP) at both Rayong and Chonburi estates is TESCO ([www.tescoenvigroup.com](http://www.tescoenvigroup.com)), who evaluated Toray's reverse osmosis (RO) membrane technologies to improve the water quality at the Amata estates.

### PRODUCT SELECTION

TESCO conducted pilot tests of Toray's low-fouling RO membrane elements alongside products by other leading RO membrane manufacturers. Since the feed water was tertiary wastewater containing various organic and inorganic contaminants with high fouling potential, low-fouling membrane technology was preferred.

The pilot tests revealed that Toray RO membrane did not require a clean-in-place (CIP) for an extended period (2–3 months for AMATA), which would lead to selecting Toray, including the timely availability of regional technical support.

### SOLUTION

For two-thirds of all wastewater, the WTP's at AMATA uses Sequencing Batch Reactors with Biological Aerated Filtration technology, while conventional activated sludge treats the remaining water. Ultrafiltration (UF) treats seventy percent of the tertiary wastewater to reduce turbidity, followed by Toray's low-fouling RO membrane to reduce total dissolved solids (TDS) before being resupplied to nearby factories. The remaining thirty percent of the treated wastewater is used in the estates for irrigation of common areas and golf courses and cooling processes at the Amata B. Grimm power plants.



Figure 1: Plant locations in Thailand

Table 1 — Quick Facts

Plant location	Rayong	Chonburi
Feed source	Tertiary wastewater	
Treatment	UF > RO	
Membrane model	TML20D-400	
Membrane type	Low-fouling polyamide	
Active area	37 m <sup>2</sup> (400 ft <sup>2</sup> )	
System capacity	9,360 m <sup>3</sup> /d	7,000 m <sup>3</sup> /d
Elements/train	6M	
End use	Industrial process and grey water	
Commissioned	Jan 2012	Dec 2015



Figure 2: RO permeate

KEY RESULT

Using Toray's low-fouling polyamide composite membranes, the WTPs at the AMATA estates operated the RO systems for more than five years before requiring replacement of the RO elements. This low replacement rate has saved the end-user considerable operational and capital costs and is one of the most successful wastewater reuse plants in Thailand.



Figure 3 : RO skid

TORAY INDUSTRIES, INC.

Head Office: Nihonbashi Mitsui Tower 24<sup>th</sup> Floor, 1-1, Nihonbashi-Muromachi 2 chome, Chuo-ku, Tokyo, 103-8666, JAPAN

[www.water.toray](http://www.water.toray)

+81 3 3245-4540

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