

Biogas Plant

The Biogas Plant consists of a 2500m³ Biogas Holder, Biogas Desulfurization Tower, Biogas engine and Waste Gas Burner. Pantai 2 RSTP has been designed to produce up to 9,600 m³/day of Biogas. Under normal operating condition, all biogas generated from the digestion process is being utilized by the CHP engine to produce electricity from the 2 Nos spark ignition gas engines which is rated at 330 kWe each. Any excess biogas will be utilized by a hot water boiler to supply hot water to heat the sludge in the digesters. A waste gas burner is also provided as an emergency flare.



Gas Holder



Gas Engine

Closed-circuit Television (CCTV)

78 numbers of CCTVs are installed surrounding the Pantai 2 RSTP.

Solar Panel

The parking lot inside Pantai 2 RSTP is equipped with solar panels which are capable to produce 200kwh electricity for the plant consumption.

SCADA

This plant is equipped with Supervisory Control and Data Acquisition (SCADA) for overall plant monitoring and system control.

Final Effluent (FE) Treatment Plant

Reclaimed FE for plant utilization is treated using ultraviolet (disinfection) and ultrafiltration. Reclaimed FE for the Eco Park is further treated using reverse osmosis, RO.

Ventilation System

Pantai 2 RSTP is a fully underground plant. 160 numbers of ventilation system are installed to provide a safe working environment for the operators and to ensure performance of the equipment and devices.

Eco Park

A 12 hectares of recreational park is built above the sewage treatment plant. It consists of sport facilities such as football field, futsal court, volleyball court, takraw court, jogging track together with cafeteria and a multipurpose hall.



PANTAI 2 REGIONAL SEWAGE TREATMENT PLANT (RSTP) KUALA LUMPUR

INDAH WATER KONSORTIUM SDN. BHD.
PANTAI 2 STP
NO 1 JALAN KAMPUNG PASIR 1
59200 PANTAI DALAM
KUALA LUMPUR W.P



OTHER FACILITIES

Odor Scrubber System (OCS)

A total no of 5 units of OCS are provided to treat odorous gases generated from the sewage treatment and sludge treatment facilities.

Laboratory

Daily sampling and testing is conducted in the plant's laboratory for control and monitoring of the plant performance.

Perimeter Intrusion Detection System (PIDS)

Pantai 2 RSTP equipped with photo beam detectors system located at 17 zones. Any trespasser will be detected by the PIDS and alarm signals will be connected directly to the cameras which capable to position and zoom for capturing the trespasser image automatically.

Under the 10th Malaysia Plan, the large aerated lagoon sewage treatment plant in Pantai Dalam was upgraded and converted into a state of the art mechanized underground regional sewage treatment plant (RSTP) with public amenities. The plant known as Pantai 2 RSTP has an ultimate design capacity of 1.423 million population equivalent or 320 MLD of treated effluent. It is located in the Pantai Catchment which is the largest of eight catchment within the city of Kuala Lumpur. The Pantai catchment covers an area of over 6,700 ha that includes the central and south-western parts of Kuala Lumpur.

The construction of the Pantai 2 RSTP started in July 2011 and was completed in July 2015. The main sewage treatment plant is built below ground level whilst the sludge treatment facility is above the ground level, over 17 ha of land area which also includes an above ground recreational park and amenities. Pantai 2 RSTP utilizes the Advanced Anaerobic-Anoxic-Oxic (A2O) process that is effective in removing nitrogen and phosphorus in the wastewater compared to the conventional treatment system. The plant is designed for Standard A effluent discharge quality as prescribed in the Environmental Quality (Sewage) Regulations 2009.

The facility has been designed to maximize green energy recovery through installation of solar panels and biogas utilization. The plant also has rainwater harvesting and final effluent reuse for non potable use.

General Description

The Pantai 2 RSTP capacity is shown below:

Items	Population Equivalent(PE)	Sewage Flow
		Daily Average (m3/d)
Design	1,423,000	320,175
Connected (April 2017)	800,475	180,107

The plant is classified as Para (I) under EQSR 2009 and its effluent discharges to Sg. Klang. Pantai 2 STP requires to meet the effluent standard as below:

Parameter	EQSR Std A limit (mg/l)
BOD	20
COD	120
Suspended Solids	50
Ammoniacal Nitrogen	10
Oil & Grease	5

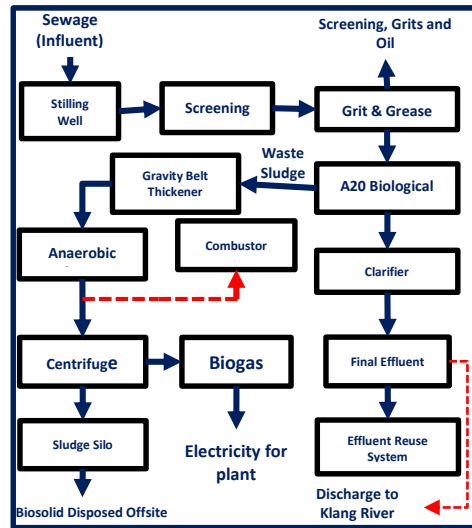
The Pantai catchment covers an area of over 6,700 ha which includes the central and south-western parts of Kuala Lumpur.

Pantai 2 RSTP Sewerage Catchment



The Pantai 2 RSTP include liquid treatment process, solids treatment process, green technology features such as energy recovery and wastewater reclamation system and an Eco Park. The schematic of the liquid and solids treatment process is shown below:

Overall Sewage Treatment Process



Liquid Treatment Process

Pantai 2 RSTP unit process for liquid stream consists of pre-treatment, biological treatment (Advanced A2O process), clarifier and waste water reclamation plant.

Pre-treatment

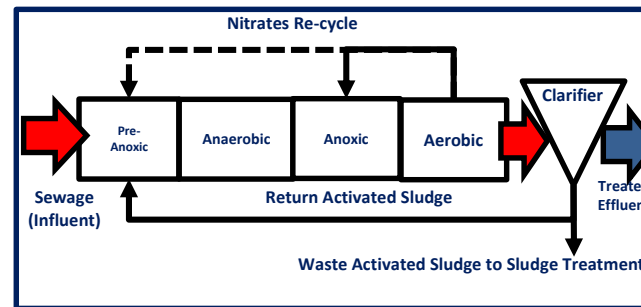
Rubbish in the incoming raw sewage is removed by using the latest screening technology. Grit, sand and other solids material are removed in the Grit chamber.

Balancing Tank

To reduce hydraulic loading during peak flow, excess sewage during peak flow will be stored at the balancing tank and return back into the system during non-peak flow. It is equipped with an ultrasonic flow sensor for flow monitoring.

Advanced A2O process

Advanced A2O process is designed using a smart inflow system and flexible recirculation system to improve the distribution and utilization of carbon source and removal of carbon, nitrogen and phosphorus.



The aeration process is supported by a total of 8 Nos of turbo blower connected to series of fine bubble diffusers in the aeration tank

Clarifier

The water phase and sludge is separated in the clarifier. Scum and other floating debris are removed by scrapper. The clarified supernatant overflows through the weir and flows as treated effluent. Sludge that settled at the bottom of the clarifier will be pumped back to the A2O tank as return sludge and to WAS buffer tank as waste sludge.

Solids Treatment Process

WAS buffer tank and thickening

The waste sludge is periodically pumped out of the clarifier tank into the WAS Buffer Tank prior to the thickening process. In WAS buffer tank a submersible mixer is provided to prevent sludge from settling in the tank.

Gravity Belt Thickener

The sludge is being thickened by 4 Nos of Gravity Belt Thickeners to reduce the water content and increase the solids content to 4- 5 % dry solids content. Polymer is added into the feed of the thickeners to assist with flocculation prior to feeding into the thickeners.

Anaerobic Digester

The anaerobic digester will further stabilize the thickened sludge prior to dewatering. Anaerobic digestion process take place in the absence of oxygen at around 35 to 40°C to produce Biogas. There are 4 no. of Digesters on site with a capacity of 4,480m³ each. The digesters operate as a fill and spill Continual Stirred Tank Reactor.

The digesters are concrete tanks with insulation to ensure minimal heat loss. All Biogas generated is sent to the onsite Biogas Plant for energy recovery.

Sludge Dewatering Facility

Digested sludge is dewatered using 4 Nos Centrifuge Decanter. Centrifuge decanters are used to further removed the water content of the sludge to a final solids content of 20% dry solids.

Sludge storage silo

The dewatered sludge from the Centrifuge Decanters will be transferred from the sludge dewatering system to 2 Nos of Sludge Storage Silo via screw conveyors where the sludge will be stored before off -site disposal.



Admin Building



Clarifier



Turbo Blower



Belt Thickener



Centrifuge Decanter



Digester



Sludge Storage Silo



Standby Generator



Odour Scrubber System



Eco Park