

Case Study Pico Wastewater Treatment

AMATA City Industrial Park, Thailand

Background

Amata Nakorn Industrial Estate is located in Chonburi province on the Eastern seaboard of Thailand. It is owned by Amata Corp. PCL covers a total area of 5,931 acres (2,400 hectares). Through a subsidiary company Amata Water Co. Ltd, Amata City provides centralised waste water treatment services to the park's industrial tenants with 2 WWTP's. Industries represented include automotive, chemical, paint, engineering, food and beverage and general manufacturing. The plant has a design capacity of 176,573 cu ft (5,000m³) per day and has a current average daily flow of 197,762 cu ft (5,600m³) with a capacity increase underway. Influent to the plant is moderate strength industrial waste water



Grit Chamber



Aeration Pond



Sediment Tank

Challenges

Variability of influent in terms of quality parameters and range of contaminants is a challenge in achieving consistent plant operational outcomes and discharge standards. Odor was also a problem with some history of complaints.

Application

PICO Wastewater Treatment Product was applied under a controlled trial during the period of 5 May 2008 to 30 June 2008. Data was taken for 14 days as a baseline and PICO dosing commenced on 20th May 2008. Measurements were taken for a total of 28 days. PICO was mixed into solution in a 264Gal (1,000L) reservoir with continuous aeration and metered into the plant to achieve the following dosage rates:

BEFORE TREAT



BEFORE TREAT



Day 1: 4ppm

Day 2: 2ppm

Day 3: 1ppm

Day 4-14: 0.5ppm

The solution was added into the Grit Chamber at the inlet to the WWTP to provide maximum resonance time.

Results

Data was captured by the plant operators and entered into the daily monitoring and control sheet following normal daily procedures. Influent quality parameters of Biological Oxygen Demand (BOD₅) and Chemical Oxygen Demand (COD) were taken at the Equalisation Tank directly down stream of the Grit Chamber and the dosing of PICO. Effluent was taken at the discharge point of the EATs.

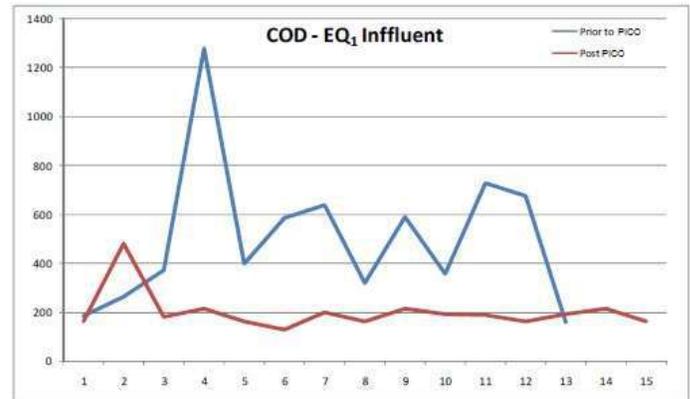
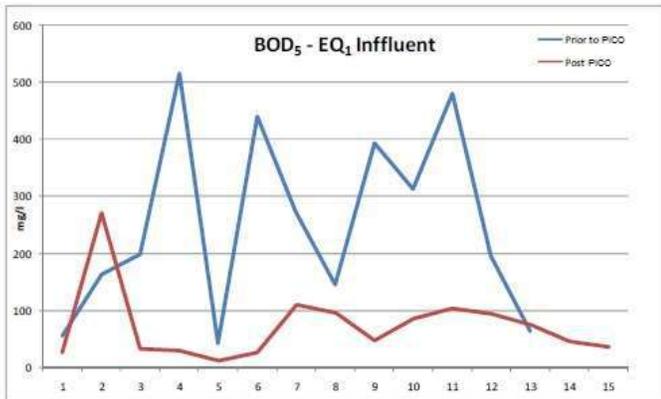
Average Results for each 14 day period is shown in the table below:

	Control Period		PICO	
	Influent	Effluent	Influent	Effluent
(mg/l)				
BOD ₅	252	11	73	7
COD	505	71	200	52
SS	115	33	129	23
MLSS		3,526		2,341
MLVSS		2,962		1,885
SV ₃₀		710		470

	Control Period		PICO	
	Influent	Effluent	Influent	Effluent
(oz/gal)				
BOD ₅	0.0336	0.0015	0.0097	0.0009
COD	0.0674	0.0095	0.0267	0.0069
SS	0.0154	0.0044	0.0172	0.0031
MLSS		0.4708		0.3126
MLVSS		0.3955		0.2517
SV ₃₀		0.0948		0.0628

Daily BOD₅

Daily COD



AFTER TREAT

14 DAYS



AFTER TREAT

14 DAYS



AFTER TREAT

14 DAYS



Discussion

BOD₅

Influent to the Extended Aeration Tanks (EAT's) showed a 71% reduction in average BOD₅ when PICO was applied. This is due to the rapid removal of organic waste by PICO. Mean Average Deviation (M.A.D.) showed a 69% improvement highlighting the reduced variability in influent BOD₅ and the improved plant stability. This reduced BOD₅ load

into the EAT's provides the opportunity to either reduce electricity consumption due to the natural increase in Dissolved Oxygen (D.O.) levels, or it can provide an opportunity to improve the plant capacity without capital expenditure due to higher efficiency of the biological system.

COD

Influent to the Extended Aeration Tanks (EAT's) showed a 60% reduction in average COD when PICO was applied as a catalyst. Mean Average Deviation (M.A.D.) showed a 81% improvement highlighting the reduced variability in influent COD and the improved plant stability. This simplifies plant operations. Again the reduced COD load into the EAT's provides the opportunity to either reduce electricity consumption due to the natural increase in Dissolved Oxygen (D.O.) levels, or it can provide an opportunity to improve the plant capacity without capital expenditure due to higher efficiency of the biological system.

SS

Suspended Solids in the influent rose from an average of 0.0154 - 0.0172oz/gal (115 - 129mg/l) when PICO was added to the plant. When PICO is first added to a plant it begins to activate the accumulated sludge that has built up through the plant. As a result during the initial weeks it is common to see a rise in influent SS levels. Due to the increased plant efficiency however, effluent SS is improved 0.0044 - 0.0031oz/gal (33 - 23mg/l). As the accumulated sludge is digested, influent SS will fall and there is an overall reduction in bio-solid sludge output.

MLSS

Mixed Liquor Suspended Solids in the EAT's was reduced by 34%. This is despite the increased SS in the influent as described above. Again when the accumulated sludge is digested the MLSS will drop dramatically. This would be expected over the period 2 to 8 weeks following introduction. In the 2nd week of PICO dosing, the average MLSS levels fell compared to the first week beginning to show this effect.

MLVSS

Mixed Liquor Volatile Suspended Solids in the EAT's was reduced by 36%. The comments above for MLSS also apply to the MLVSS.

SV30

The Sludge Volume 30 minute settling test has shown a reduction from an average of 0.0948 - 0.0628oz/gal (710 - 470mg/l). This is due to the reduced sludge volume. Sett ability of solids is improved when PICO has been used for some time. Reductions in bio-solids output in industrial WWTP's in excess of 90% have been experienced following continuous usage. Corresponding to this sludge volume reduction is a reduced consumption of chemicals such as polymer for coagulation and flocculation.

About PICO Wastewater Treatment Product

The result of over 30 years of research and development, PICO is a powerful blend of biocatalysts that breaks down complex organic molecules to help eliminate waste, reduce odors, improve soil fertility and enhance water quality, among other uses. 100% natural and non-toxic, PICO is safe for everyday use in a wide range of consumer and industrial products. It has been proven to solve problems in environmental management (including wastewater, solid waste, soil and water remediation and industrial emissions), as well as agriculture. PICO products are used extensively and available in Asia, Australia, Europe, North America and Latin America. Developed specially for the Wastewater Treatment industry, PICO accelerates the biological removal of nutrients, pathogens, suspended solids and other contaminants from wastewater.