



Omya Optical

2,000,000 PE Municipal WWTP



THINKING OF TOMORROW

2,000,000 PE Combined Municipal WWTP

FACTS & FIGURES

- 2,000,000 PE (350,000 m³/d) municipal WWTP
- 500,000 m³ of basin volume
- Conventional treatment process: primary clarification, activated sludge including denitrification and chemical P precipitation, secondary clarification, anaerobic sludge digestion and incineration



INITIAL SITUATION

The plant is located in Northern Germany and is based on a conventional treatment scheme. The sludge age in the activated sludge process is between 3-6 days. Iron sulfate is used for phosphorus removal.

THE CHALLENGE

The influent has a low acid capacity. Nitrification results in a pH drop, often below a value of 6.5, especially during exceptional incidents. Nitrification efficiency is decreased, resulting in elevated nitrogen values in the effluent. Low acid capacity and pH also result in floc deterioration. Together with high hydraulic loads this leads to sludge run-off and breach of effluent limits.

THE SOLUTION

Omya Optical increases the acid buffer capacity and stabilizes pH. This assures continuous stable nitrification. Omya Optical also provides bivalent cations, supporting floc aggregation and improving floc structure. Stable operation is assured during exceptional operating conditions. Application is carried directly from the silo truck into the sludge return line, 2-3 times per week. Omya Optical is recirculated via the return sludge and so provides sustained release of alkalinity. A chemical equilibrium assures that pH is maintained around pH 7, making operations significantly easier.

Challenge	Impact of Omya Optical
Influent has a low acid capacity	Increased acid capacity, using chemical equilibrium as a buffer
Unpredictable pH drops	pH 7 maintained in the system
Poor nitrification due to over-acidification of the water	Stable pH at a level allowing for improved nitrification, resulting in a lower nitrogen concentration in the effluent
Lack of divalent cations causing poor floc formation, high sludge volume index and frequent sludge run-off during exceptional loads	Divalent ions resulting in a tighter floc structure, lowered sludge volume index, improved sludge sedimentation and reduced sludge runoff
Unpredictable plant behavior during exceptional weather events	Consistent and predictable operation despite dynamic influent volumes and quality
Regular intervention of workforce and high workload	Workload reduced through more stable process and operating conditions

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