



novozymes®

Rethink Tomorrow

WASTEWATER SOLUTIONS
– MUNICIPAL

Novozymes BioRemove™ 5805

Cold weather nitrification

BioRemove 5805 helped a municipal wastewater treatment plant through a cold winter.

Benefits

- 17% improvement in ammonia removal
- Removed 43-46% of the residual effluent $\text{NH}_3\text{-N}$
- Brought the monthly average effluent ammonia from 12 mg/L to 9.9 mg/L over 11 days to safely meet the monthly average limit

Background

The municipality of a mid-size city in the Northwestern US (mountains) owns and operates a 15 MGD (design capacity) advanced secondary wastewater treatment facility. The system is currently at 50% hydraulic capacity receiving 7.5 MGD of municipal wastewater. The activated sludge plant is well run and typically removed 99 percent of BOD5 and 98% of TSS.

Although the average annual ammonia effluent is 5 mg/L, the municipality is challenged in the winter months to meet their monthly ammonia limit of 12 mg/L.

Application

Facing one of the coldest winters in quite some time, the operations supervisor of the municipal plant was trending his effluent ammonia concentrations on a daily basis. The plant's effluent ammonia concentration continually teetered in and out of compliance as water temperatures hovered between 8°C and 10°C. Not willing to gamble with compliance, he contacted a local engineer for guidance. With their guidance and with the recommendation of a neighboring but smaller treatment plant, the

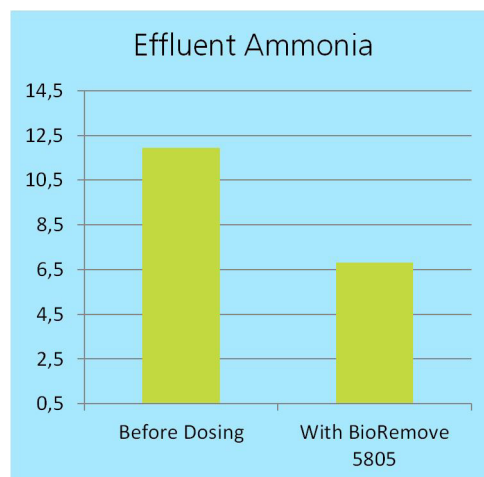
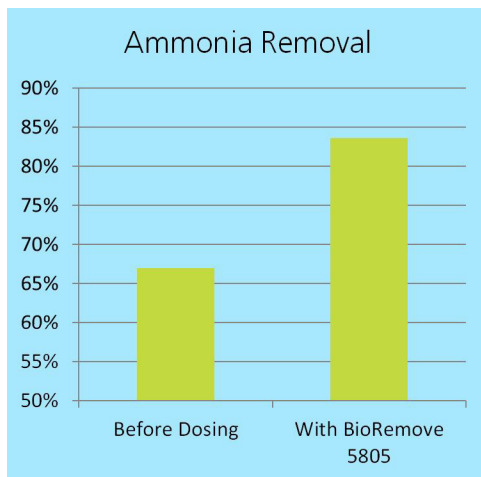
Supervisor contacted Novozymes to discuss the utilization of BioRemove 5805, a highly concentrated source of nitrifying microorganisms.

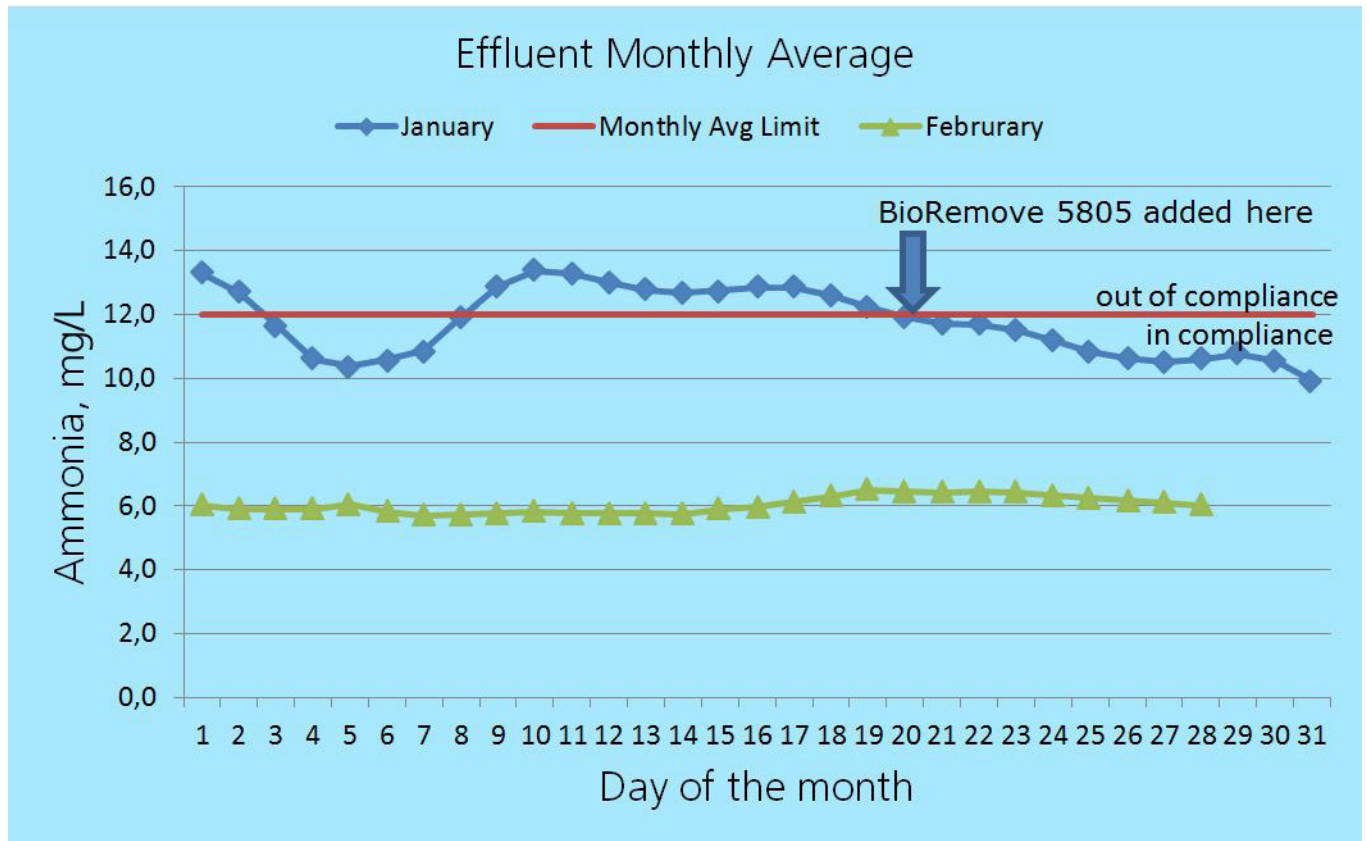
Novozymes technical staff reviewed the aspects of the application and determined that the likelihood of success with bioaugmentation was high. They provided a recommended dosage and monitoring strategy. BioRemove 5805 was expedited to the site and applied over 4 days.

The results

Within 3 days, the effluent ammonia concentrations began to decline. Within 1 week, the monthly average was safely 2 mg/L under the monthly limited and was continuing to trend downward. The improvements did not stop there. The new nitrifier biomass established so well compliance in February was a breeze, at 6 mg/L effluent ammonia (50% of the limit). Nitrification was also confirmed by seeing the equivalent increase in corresponding nitrate.

In comparing the 20 days prior to bioaugmentation and the 20 days after initiation, the differences are stark:





Conclusions

Novozymes biological program was easy to implement and provided a rapid response to improve cold weather nitrification. The municipality was able to prevent non-compliance with their effluent permit and avoid spending rate payers money on environmental penalties and associated costs with the local environmental protection agency.

The utilization of BioRemove 5805 resulted in:

- Improved plant efficiency
- Avoidance of the costs of non-compliance

For more information please visit www.novozymes.com/wastewatersolutions

Novozymes Biologicals, Inc. • 5400 Corporate Circle • Salem, VA 24153 • Tel. 800 859 2972 • Fax 540 389 2688

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