



SNDR™ Applications Report *Speedway, Indiana*

Thermal Process Systems SNDR™ Provides Exceptional Ammonia Nitrification/Denitrification following Anaerobic Digestion

The major advantages of using the SNDR in this application are:

- Reduction in ammonia recycle load to the head of the plant
- Exceptional ammonia nitrification and denitrification
- Additional VS and TS destruction
- Elimination of odors created in the anaerobic digestion process
- Conversion to an aerobic, more visually appealing solid end-product

Average results since start up:

NH₄ in Filtrate	Cake Solids	SNDR VSR	Overall System VSR
14 mg/L	21%	38%	58%

Speedway, Indiana – The Storage Nitrification Denitification Reactor (SNDR) process provides remarkable ammonia reduction and additional volatile solids destruction while oxidating objectional odors created during the anaerobic digestion process.



Speedway, Indiana is home to the world famous Indianapolis Motor Speedway—site of the Indianapolis 500—billed The Greatest Spectacle in Racing. With a population of almost 12,000 residents, Speedway is a thriving suburb of Indianapolis. On a race weekend, more than a quarter of a million race fans will converge in Speedway creating unique conditions for their wastewater treatment facility.

The Speedway Wastewater Treatment Plant is a Class IV treatment facility with a design flow of 7.5 MGD and a peak secondary treatment capacity of 8.9 MGD. The treatment process consists of the following: influent cylindrical fine screen, grit collectors, primary clarifiers, oxygen activated sludge, secondary clarifiers, nitrification towers and ultraviolet disinfection. Solids handling consists of anaerobic digestion and Thermal Process Systems SNDR™. The biosolids are dewatered with a belt filter press and pumped to a storage building. The biosolids are then utilized on farm land as a fertilizer and soil conditioner. A TPS BiofiltAer™ was also included as part of the upgrade to control any residual odors from the digestion process.

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Solids handling is accomplished in two phases. First, the sludge is treated in the anaerobic digester by heating it up to about 95 degrees and holding it for at least 15 days.

During this process, solids reduction takes place as the sludge is converted primarily to methane, carbon dioxide and cellular matter. As with all digestive processes, ammonia is also released. Prior to the addition of the TPS SNDR, the belt press filtrate of the anaerobically dewatered solids had ammonia concentrations of 800 to 1600 mg/L (up to 2000 mg/L during a race month) often causing the facility to exceed ammonia final effluent permit conditions.

In April 2012, the facility started up the patented SNDR process to accept a blend of WAS, primary sludge and nitrification tower sluff. Results show an unprecedented 98% reduction of ammonia concentrations in the filtrate which far exceeded the expectations of the facility.

The dewatered solids hauled from the facility have dramatically reduced. The results are impressive considering the material had been anaerobically digested prior to the SNDR. There are no odors associated with the SNDR process, in the dewatering building or in the solids storage area. The odors are oxidized in the SNDR and any residuals are treated in the TPS BiofiltAer.

In addition, Polymer consumption has been reduced, due to the lower percentage of solids leaving the SNDR.



"The TPS SNDR system practically operates itself. Additionally, there are so many other minor benefits that were realized after we installed the SNDR process, it's amazing no one has come up with this before. Kudos to TPS for doing it right the first time."

*~ Norman C. Berry Jr., Superintendent
Town of Speedway WWTP*

The SNDR process installed at Speedway accomplishes the follow:

- Ammonia reduction of 98% in the filtrate post dewatering
- 33% decrease in the consumption of polymer
- Additional VSR averaging 38%
- Oxidation of odorous sulfur compounds
- TPS BiofiltAer assures no offensive odors on site
- Reduced tipping and disposal costs by 30%
- Increased cake solids to 28% off BFP



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