

Hunter's Ridge Subdivision, WSS WWTP

At the time of acquisition, WSS was a distressed extended aeration package plant with internal clarification and no disinfection systems. The plant was built below the floodplain, regularly over-flowing untreated waste into the receiving creek. WSS was covered in dried sludge created by wastewater flushing the entire plant onto the ground. The WSS plant was visibly structurally damaged due to the plant "floating" as a result of hydrostatic pressure from the surrounding groundwater. Half of the blower equipment was not functioning prior to the acquisition and the sludge holding tankage had been abandoned for an improvised out-of-ground plastic farm tankage. Flow monitoring demonstrated the plant was regularly surcharging (overflowing) due to infiltration and inflow (I & I) and WSS was unable to consistently treat for nutrients. Biological Nutrient Removal (BNR) is a process used for nitrogen and phosphorus removal from wastewater before it is discharged into surface or ground water.



To fix the issues at Hunter's Ridge Waste Water Treatment Plant (WWTP), Racoon Creek built a new activated sludge WWTP, converted the old WWTP to I&I storage/treatment, added ultraviolet disinfection, built a pump station to properly process flow between the plants, and performed smoke testing with corresponding fixes to lower I&I.

Inflow and infiltration (I & I) are terms used to describe the ways that groundwater and storm water enter into dedicated wastewater or sanitary sewer systems. Inflow is storm water that enters into sanitary sewer systems at points of direct connection to the systems and infiltration is groundwater that enters sanitary sewer systems through cracks and/or leaks in the sanitary sewer pipes.

Once the sanitary sewer systems have reached capacity or becomes overloaded, wastewater flows at much higher water levels than normal and if sanitary fixtures or drains are below this overload level, water will flow backward through the sanitary sewer pipe, flooding basements or households and causing manholes to pop open releasing wastewater onto the street.



South Walnut Hills/Woodland Lake Estates, WPC WWTP

WPC seemed to have been constructed in two different time periods. Two poured-in-place concrete structures were adjacent to the steel aeration package-type plant. The concrete tankage was not connected to the aeration plant. The plant problems included regular overflows of untreated waste into the receiving creek, flooding the adjacent ground onto the ground directly into the adjacent stream, a non MDNR design compliant sludge ground plastic farm tank, and an inability to treat waste for nutrient removal. Woodland Lake Estate's old WWTP operating permit expired in early 2015, missed it's schedules of compliance for nutrient removal and the sand filter system was installed using subsidizing wooden tie walls with some type of possibly Thermoplastic polyolefin (TPO) roofing material as the WWTP membrane liner that was exposed. Recirculating sand filter systems are not designed to treat sanitary waste for nutrient removal.

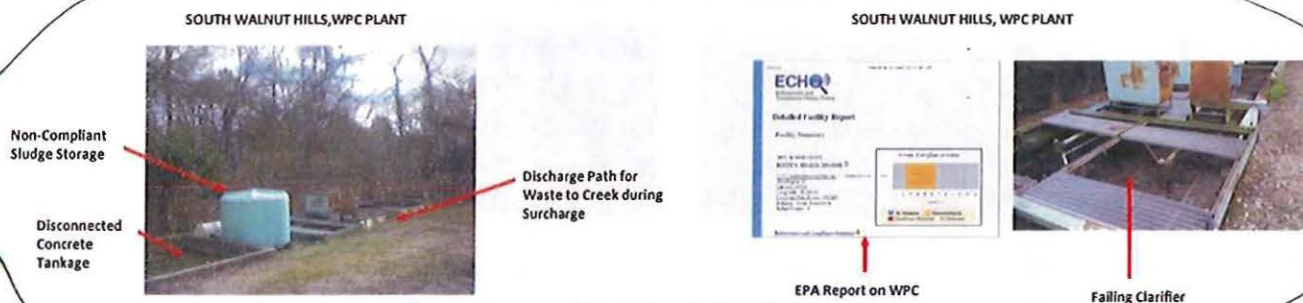


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To fix the issues at WPC, Raccoon Creek built a new activated sludge WWTP, converted the old WWTP to I&I storage/treatment, closed the recirculating sand filter, built a gravity line extension, built a pump station to properly process flow between the plants, and performed smoke testing with corresponding fixes to lower I&I.

SOUTH WALNUT HILLS, WPC PLANT



Old WWTP Converted to I&I Storage (you can see it's filled in picture)



New Activated Sludge Plant

Conversion of Disconnected Concrete Tank to Sludge Holding

The Villages at Whiteman WWTP

The Villages wastewater conveyance and treatment system feeds a three cell aerated lagoon system with a poured-in-place concrete chlorine disinfection system. At the time of acquisition only one cell had functioning aeration; there was build up of sludge deposits above a cell waterline; the plant was unable to treat for ammonia; existing disinfection allowed organic material in the effluent (outflow), and the plant surcharged.

THE VILLAGES AT WHITEMAN, VILLAGES PLANT

Original Three Cell Aerated Lagoon



THE VILLAGES AT WHITEMAN, VILLAGES PLANT

Detail of 2nd and 3rd Lagoons



2nd Lagoon Cell with Failed Aerator



Sludge & Waste over the Water Line of Lagoon

To fix issues at The Villages, Raccoon Creek built a moving bed bioreactor plant (MBBR), removed 35 years of lagoon sludge for I&I storage and treatment, improved disinfection, built a pump station to properly feed the MBBR plant, and performed smoke testing with corresponding fixes to lower I&I.

THE VILLAGES AT WHITEMAN, VILLAGES PLANT



New Moving Bed Bio-Reactor Plant with New Pump Station



New Lagoon aeration with De-Sludged Clean Basin