Case Study - Waste Water Treatment Plant - Struvite

Four Month Evaluation of Hydropath Technology's ability to treat magnesium ammonium phosphate (struvite)

- Preliminary Findings -

Updated on: September 20, 2013

Location: City of Walla Walla Waste Water Plant (Washington State, USA).

Application: Struvite accumulation in belt press.

Device: *Hydro*FLOW P12" water Conditioner.

Installation date: May 31, 2013.

First inspection: July 9, 2013 (*Hydro*FLOW on for 5 weeks).

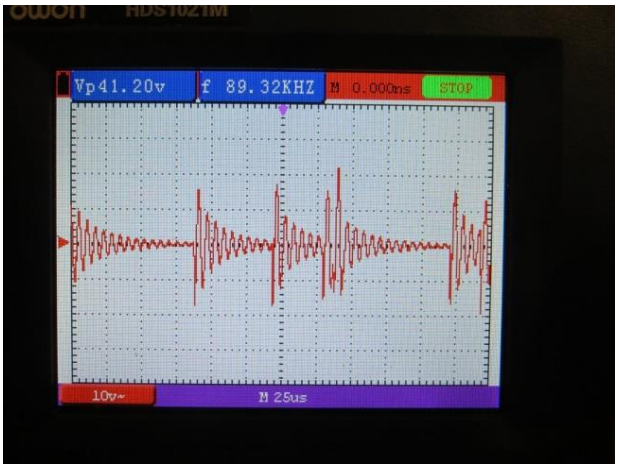
Second inspection: July 25, 2013 (*Hydro*FLOW on for 8 weeks).

Third inspection: August 26, 2013 (*Hydro*FLOW off for 4 weeks).

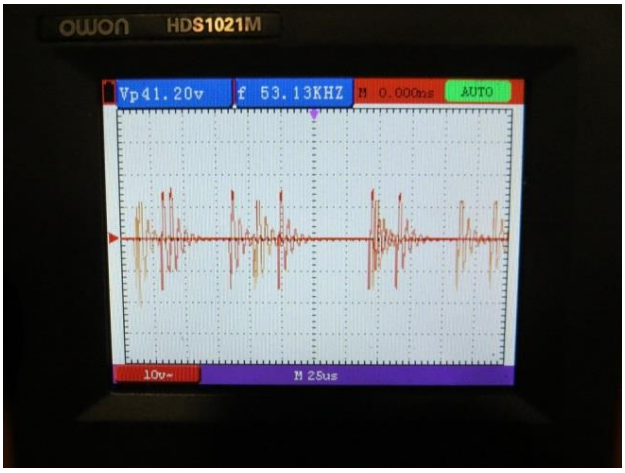
Fourth inspection: September 18, 2013 (*Hydro*FLOW off for 7 weeks)

Belt Press

Bench test of P12” device prior to installation - Average of 41.20 volts peak-to-peak and strong Hydropath signal.



Installed *Hydro*FLOW P12” device - Average of 41.20 volts peak-to-peak and strong Hydropath signal.



Belt press roll - comparison pictures

May 31, 2013: A 12” X 12” section was scraped clean inside the roll. The struvite accumulation was very hard and needed to be removed with a chisel.

Expectations: The roll area does not have constant water flow which will most likely not allow for dramatic results of struvite removal but should prevent its accumulation.

July 9, 2013 (*Hydro*FLOW on for 5 weeks): No accumulation on 12” x 12” section. Struvite removal is slow yet noticeable

July 25, 2013 (*Hydro*FLOW on for 8 weeks): No accumulation on clean section and struvite layers being gradually removed.

August 26, 2013 (*Hydro*FLOW off for 4 weeks): The *Hydro*FLOW device was turned off in order to demonstrate struvite accumulation without it. Please note that precipitated minerals tend to attach to existing deposits, which explains why the accumulation is spreading from the edges to the center of the 12”x 12”section.

September 18, 2013 (*Hydro*FLOW off for 7 weeks): The cleaned section is completely covered with a very hard struvite layer of 1/8”. The a small section was chiseled in order to expose bare metal.

Belt press pan - comparison pictures

May 31, 2013: A 12” X 12” section was scraped clean on the pan. The struvite accumulation was very hard and needed to be removed with a chisel.

Expectations: The pan area has constant water flow which will most likely allow for dramatic results of struvite removal.

July 9, 2013 (*Hydro*FLOW on for 5 weeks): The 12” x 12” section is not noticeable. The struvite deposits are very soft. The below picture shows finger marks in order to depict the softness of the mineral deposits.

July 25, 2013 (*Hydro*FLOW on for 8 weeks): The struvite deposits are soft and can be washed off easily with a hose.

Soft struvite “paste” that was removed from the pan.

August 26, 2013 (*Hydro*FLOW off for 4 weeks): The *Hydro*FLOW device was turned off in order to demonstrate struvite accumulation without it. A 1/8" layer of medium hardness struvite accumulated within 4 weeks. The struvite is not as hard as inside the roll section.

September 18, 2013 (*Hydro*FLOW off for 7 weeks): A 1/4" layer of medium hardness struvite accumulated within 7 weeks. The struvite is not as hard as inside the roll section. It can be scraped but not washed off.