CONTECH CONSTRUCTION PRODUCTS INC.

Parameter Brief

Performance of the Stormwater Management StormFilter® with PhosphoSorb Media

Background

Inorganic phosphate, typically associated with sedimentary rock, can typically be removed from stormwater by physical straining through a porous filter medium. Organic phosphorus, typically associated with decomposition of animal and plants, is the most challenging form of phosphorus to remove from stormwater. While some organic phosphorus in particulate form can be physically strained (e.g. leaves, bud shatter, lawn clippings), the remaining portion must either be taken up by plant adsorption or through a phosphorus sorption capacity of a filter medium. Organic particulate phosphorus has the potential to be unstable as previously captured materials decompose or become soluble (Figure 1). As total phosphorus removal goals become more stringent across the country, the adsorption of soluble organic phosphorus (also known as Ortho-Phosphorus or Ortho-P) will be required to achieve lower effluent concentrations.

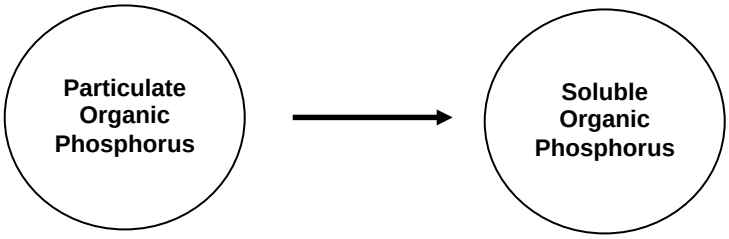

Figure 1. Particulate organic phosphorus transfers to soluble phosphorus.

PhosphoSorb™

PhosphoSorb, figure 2, is a lightweight media targeting soluble and particulate phosphorus. The media is comprised of a heat-expanded volcanic rock and activated alumina. The expanded volcanic rock provides the capability to remove suspended solids while the activated alumina targets soluble phosphorus adsorption.

Figure 2. PhosphoSorb Media

Suspended Solids Performance

PhosphoSorb is composed of a slightly finer media gradation than the field proven ZPG™ (Zeolite, Perlite, Granular Activated Carbon) media and will provide equivalent - or even better - removal of suspended solids. Initial field tests have indicated an increase in the Total Suspended Solids removal efficiency up to 10% over the field-proven ZPG media. The StormFilter with ZPG media has already received a General Use Level Designation for basic treatment in the State of Washington.

Phosphorus Performance

Figure 3 contains benchmark laboratory tests comparing different media types for removing Ortho-P. These laboratory tests show the adsorption capability or removal of the different media types for each bed volume trial at an influent concentration of 0.5 mg/L (CONTECH, 2009). The laboratory tests have demonstrated that PhosphoSorb can out perform GAC in removal efficiency, load, and longevity (CONTECH, 2009).

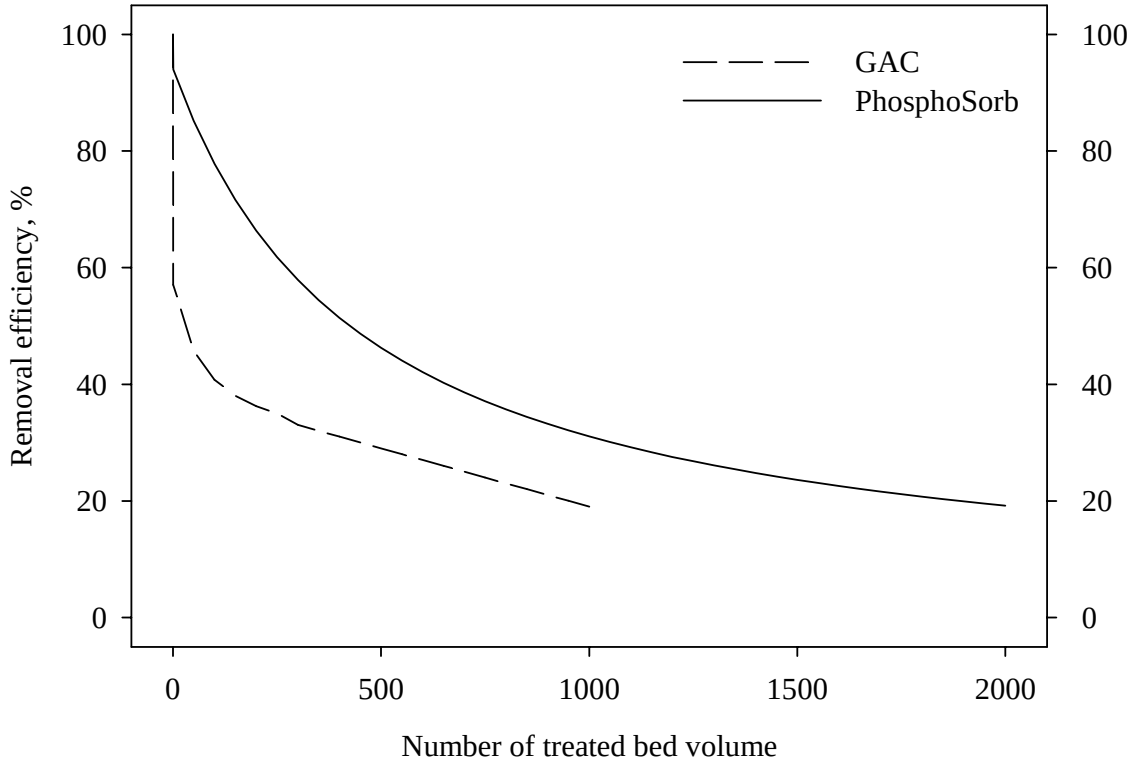

Figure 3. Soluble Phosphorus breakthrough tests were conducted evaluating Granular Activated Carbon and PhosphoSorb.

Limited field tests have indicated that PhosphoSorb can improve the total phosphorus removal efficiency by 5 to 10%, when compared to ZPG media. PhosphoSorb has been able to achieve a total phosphorus effluent quality that is near 0.05 mg/L at low influent concentrations in limited field trials. PhosphoSorb is comparable media to ZPG for suspended solids removal in the field and contains the ability to remove higher amount of soluble organic phosphorus in the laboratory. This suggests that PhosphoSorb can be another media option for phosphorus sensitive waterways.

Phosphorus Media Selection Guide

Perlite < ZPG < PhosphoSorb™

Good ----------► **Best**

References

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