Gross Pollutant Traps

by Tash Hughes of Word Constructions

 Gross Pollutant Traps, or GPTs, are devises used to prevent large items polluting waterways.

They are used in stormwater drains, urban wetlands, airports, beach fronts, industrial plants, flood plains and other locations. They generally collect larger items from the water, such as take away containers, leaves, bottles and plastic bags. Smaller pollutants, such as dirt, chemicals, heavy metals and bacteria are not collected directly by the GPTs; however, some small particles are caught up in the larger items in the trap and thus prevented from reaching the waterway.

GPT Types

There are two main categories of GPTs. They are grouped according to storing a dry or wet load; collected items are either stored above (dry) or below (wet) standing water levels.

Traps that store trapped items in a dry state are generally cheaper to operate as the collected material can be delivered to local landfill facilities without issue.

Wet loads traps are more complicated and thus more expensive to operate. They require suction equipment for cleaning and the wet wastes are classified as toxic liquids. Disposal is via an environmentally controlled waste station under strict guidelines. There is also the risk of further pollution occurring if the trap is cleaned infrequently; biochemical reactions take place between pollutants in the store area and the by-products can be washed into the waterway, especially in overflow conditions.

Different traps can be designed using one or a combination of the following techniques:

- ❖ Screening

- ❖ Stilling or stopping the flow of water

- ❖ Flow separation

- ❖ Sedimentation

- ❖ Flotation

Traps can be small, such as a screen over an inlet pit, or very large when it straddles a channel and can have a footprint up to 20 metres

Design Factors

The design of a GPT should be specific to the location it is to be used in. A GPT that works well at the entrance of an urban wetland will be less effective in the centre of a concrete work area, for instance.

Traps are designed to meet the mid rainfall expectations of the given area; swales may be placed upstream to help cope with higher rainfall situations.

Some factors to be considered in GPT design are:

- ❖ Size of particles to be caught in that location

- ❖ Physical space available for the trap

- ❖ Frequency of storms or other major water influxes

- ❖ Average flow rates over a year

- ❖ Maintenance requirements – the ease and safety of access for maintenance work

- ❖ Frequency of maintenance that is practical in the location (obviously less often in remote places, more often in high pollution areas)

- ❖ Estimated loading in the area

- ❖ Safety and aesthetics of the trap being exposed or enclosed

- ❖ Installation and operating costs

Also to be specified is the maintenance schedule appropriate for the trap. The size of the trap and the likelihood of biochemical reactions will affect this schedule, also.

Alongside roads, litter baskets (especially SEPTs – Side Entry Pollutant Traps) and trash racks may be used instead of GPTs. Likewise, floating booms are often an alternative or an additional measure in low velocity water. Recent studies have shown that less than 20% of litter floats along the water so floating booms are of limited use in screening out large pollutants.