



Stormwater threat to river systems

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TRADITIONALLY RIVER POLLUTION control measures have been restricted to effluent discharges while stormwater management has relied on engineering principles to minimise flooding. With the imposition of stringent effluent disposal standards in the recent past in many parts of the world, stormwater runoff from urban areas, roadways, agricultural and farming land, construction areas, industrial sites, roof tops and landfill sites has become the 'limiting factor' for river pollution. The severity of this kind of pollution depends on the degree of urbanisation, land use patterns, sanitation and garbage disposal practices, soil types, climate and hydrology. Stormwater discharges are responsible for between one and two-thirds of existing and threatened impairments of the waters of the United States of America (USEPA, 1991), and this is true for many countries of the world. It is a common occurrence in Asian countries for stormwater systems to act as an open sewer, and as a transport medium conveying litter and other waste material into the rivers. Some of the effects on river systems include decreased dissolved oxygen levels, transfer of toxicity to aquatic life and growth

stimulation of toxic algae and other undesirable macrophytes.

The current stormwater management philosophy of many countries often overlooks the environmental impact of polluted stormwater runoff on rivers and streams. There have been instances where stormwater compared in quality to sewage (Table 1).

In Melbourne, Port Phillip Bay receives tonnes of sediments and nutrients and a variety of toxic materials from over 300 stormwater drains (Environmental Protection Authority, 1995). From a stormwater monitoring project in Sydney (Ferguson et al, 1995) it was found that:

- pollutants in stormwater increased with the amount of development in a catchment;
- small highly urbanised catchments drained by concrete stormwater channels showed some of the highest pollutant levels;
- the majority of pollutants studied, nutrients, suspended solids and faecal coliform, find their way into stormwater systems during periods of heavy rain; a

Table 1. Comparison of stormwater characteristics with other sources

major source of faecal coliform in the stormwater system in wet weather is from sewer overflows.

Control options

Decreasing water quality in rivers is the prime environmental issue across Asia and this will continue if no action is taken to control stormwater pollution. One option is to consider 'Best Management Practices' (BMPs), which involve the application of the best available technologies to deal with a particular problem. Some of these practices in stormwater management include the use of detention basins and infiltration basins, maintenance of riparian vegetation and the use of vegetated channels for stormwater discharge. At times, the above practices may not be fully effective. Thus, the best option is to start at source to control the stormwater pollution, which may include review of practices that cause the problem, com-

munity education to change bad practices and the use of litter reduction campaigns.

References

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- ³ Metcalf and Eddy (1991). "Wastewater Engineering - Treatment, Disposal, Reuse". McGraw-Hill International Edition. pp 1 120.
- ⁴ USEPA (1991). "Urban runoff inputs to receiving waters". United States Environmental Protection Agency Watershed Management Unit, Water Division, Region V, Chicago, IL.