

## Case Study

# Bio Filtration

Infiltration Basin Using Reactive Filter Media

Project Manager: Leichhardt Council

Enviro-media is a specifically engineered infiltration medium that uses selected organic matter or a blend of selected organic matter and minerals such as sand and soil that are used to physically, biologically and chemically treat contaminated air, soil and water. Treatment is achieved by physically filtering sediments and contaminants, chemically binding contaminants to organic matter and biologically degrading contaminants.

Leichhardt Council was successful in gaining a Storm Water Trust Grant to improve the quality of local waterways by demonstrating quality storm water management practices. The project is located in Whites Creek Valley Park at the corner of Smith and Gillies St, Annandale. With three traffic lanes each way and substantial paved surfaces, the potential for large volumes of surface run-off to cause erosion to sensitive areas is a major environmental concern. Although drainage systems are in place there are a number of areas that could have potential erosion problems.

The construction involves conveying stormwater collected from one of Leichhardt Councils' Annandale drainage sub-catchments and channelling the contaminated stormwater into an infiltration basin located in an adjacent park. The infiltration material is an Enviro-media design to remove various contaminants including, gross litter, grass clippings, animal droppings, heavy metals and hydrocarbons, etc. The infiltrated water is then collected in a layer of drainage cells made from recycled plastic and directed back into Whites Creek Channel. The system is fully gravitationally operated and requires no power supply and consequently is energy efficient. The environmental significance is that the channel discharges into Rozelle Bay that flows into Sydney Harbour.

Until now, storm water detention basins have been used to regulate the flow of stormwater quantities however, little focus has been placed on the quality of water detained. The Annandale infiltration basin combines both the volume aspects of regulating storm water as well as purifying contaminated storm water.

The Enviro-media used in the infiltration bed treats the contaminated storm water in three ways: physically, chemically and biologically. The infiltration media physically removes contaminant-laden sediments and suspended solids by filtering

these particles from the storm water. Dissolved contaminants such as nutrients are removed by a process known as cation exchange, whereby organic particles attract the contaminants. Bio engineering facilitates assimilation of the contaminants by microorganisms that convert them to plant nutrients and elements.

Selected recycled organics used in Enviro-media substantially improves the cation exchange efficiency compared to a pure sand filter. Sand on its own has a cation exchange efficiency of 2 milligrams equivalent (meq) whereas recycled organics have a cation exchange efficiency of 160 meq at pH 7 (Hendreck and Black, 194).

Leichhardt Council has reported that the Storm Water Infiltration Basin has been well received by the local community and test results indicate that the level of reduction in contaminants has been most encouraging. The project was completed in May 2000 and the School of Geo-sciences, Sydney University, is conducting ongoing testing.

