Confined Water Sensitive Urban Design Stormwater Filtration/Infiltration Systems for Australian Conditions

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Presentation Summary

- Water Sensitive Urban Design (WSUD)
- Porous Pipe Stormwater Treatment Systems
- Field Sites
- Sampling Protocol
- Sampling Methods
- Sample Results
- Conclusions
- Future Work

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Water Sensitive Urban Design (WSUD)

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WSUD has obvious benefits:

- Sustainable approach to managing the urban water cycle
- Minimising impact of urbanisation
- Treatment and/or harvesting of stormwater
- Provision of alternative water supplies combined with measures to reduce potable water usage from municipal supplies

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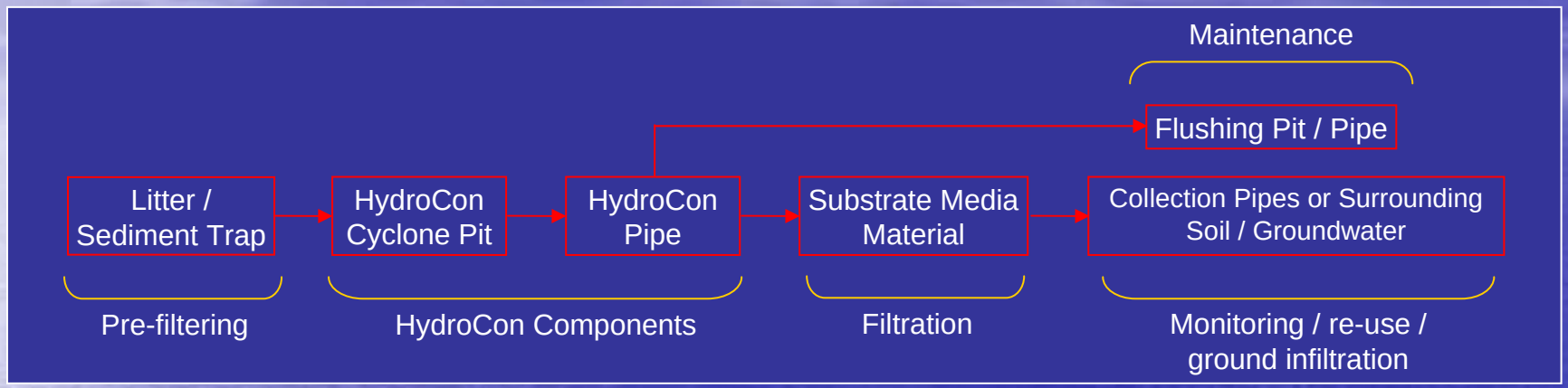
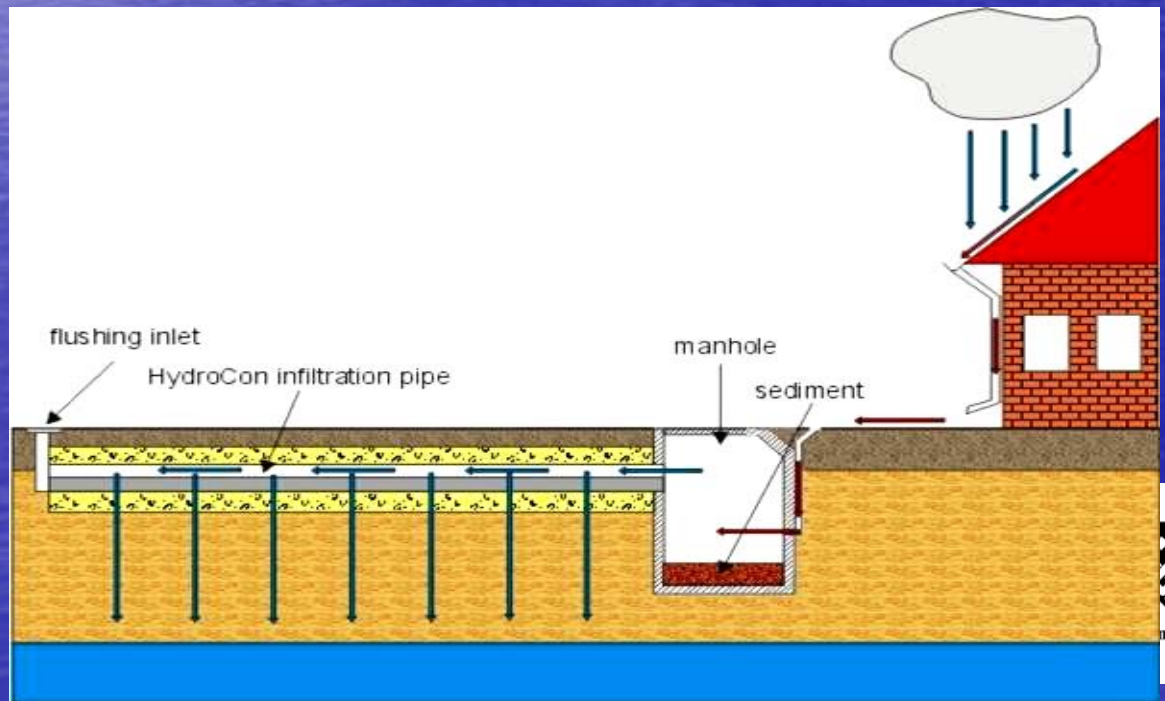
Porous Pipe Stormwater Treatment System





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Field Sites

Site Location	Mills Park Tennis Centre, Asquith	Weathertex Industrial Site, Heatherbrae	Hindmarsh Park, Kiama
Land Use/s	car park	industrial	commercial, residential & parkland
Catchment Area (m^2)	1600	2185	65000
Filtration Media	Gravel / Sand	Gravel / Sand / Sand & GAC	Sand
HydroCon Pipe Diameter (mm)	400	600	400
Length of HydroCon Pipe (m)	100	18	32
Infiltration/Filtration System	Infiltration	Infiltration	Filtration
Water Sampling Set-up	Inlet: Automatic sampler Outlet: Half-pipe collection pipes	Inlet: Automatic sampler Outlet: Half-pipe collection pipes	Inlet: Automatic sampler Outlet: Automatic sampler
Pre-filtering	Litter basket and precast sump pits	Litter baskets and a prefiltering cyclone pit	Litter baskets and screen
Receiving Location of Treated Stormwater	Discharge to Ku-ring-gai Chase National Park	Tomago Sandbeds (drinking water acquifer)	Stormwater reuse for park irrigation

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Hindmarsh Park, Kiama

System during dry weather

System surcharging during wet weather

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Mills Park Tennis Centre, Asquith

- site selected for seeding of the filter media with nutrients, organic matter and microbial populations
- system flushed with treated effluent

Area upstream of the system

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Weathertex Industrial Site, Heatherbrae

System during construction

System during dry weather

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Sampling Protocol

- Detailed protocol developed
- Quality assurance

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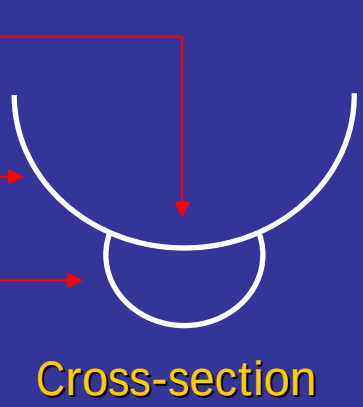
Sampling Methods

- Automatic Samplers

- Half-Pipe Collection System

A line of slits are positioned along the invert of the half-pipe



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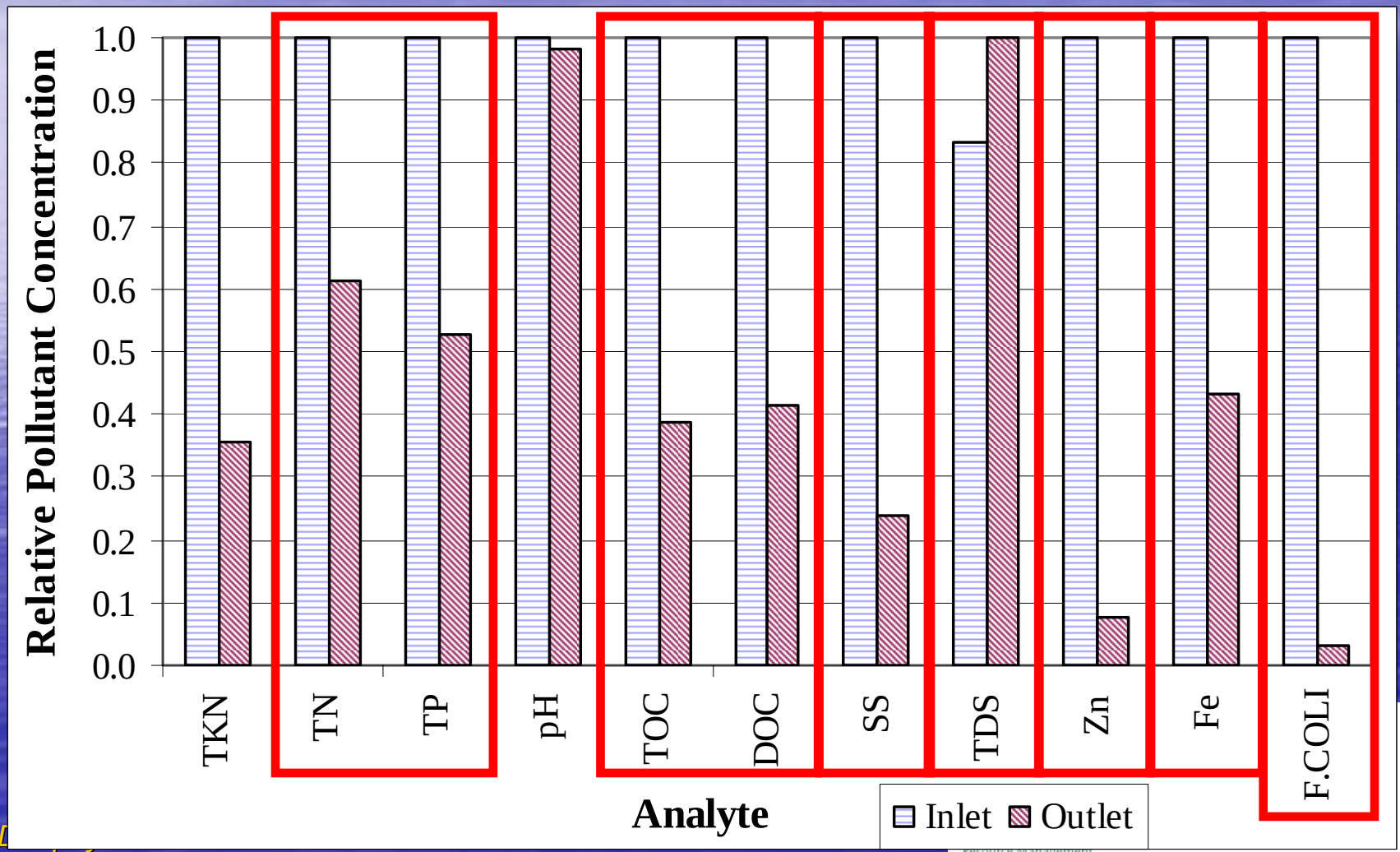
Field Investigation Results

- Hindmarsh Park, Kiama



Field Investigation Results

- Mills Park Tennis Centre, Asquith

- results indicate expected short-term increased nutrient, organic and suspended solid loads

- Weathertex Industrial Site, Heatherbrae

- most recent system to be constructed

- limited number of stormwater samples have been collected

- further collections are awaited before conclusions are drawn

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Laboratory Results

- Experimental Investigation

- preliminary laboratory tests were undertaken using GAC to investigate its organic removal capabilities – in-press

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Conclusions

- Fieldwork is ongoing, further samples are required to validate the results
- Results to date indicate the treatment system has the ability to reduce the concentration of pollutants
- Expected short-term effect of seeding a system with tertiary treated effluent has been realised

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Future Work

- Findings are part of a three-year research project
- Goal of project is to develop a model that is transferable to other sites
- Project is due to be completed by December 2006
- Further field work is to take place
- Additional experimental work is to take place

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Tak for din opmærksomhed

Thank you for your attention

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