

PORT OF BRISBANE STORMWATER MANAGEMENT

The Port of Brisbane Pty Ltd is committed to managing our activities to help protect our surrounding natural environment and ensuring our Port operations do not adversely impact on the marine environment. One important way we do this is by managing the quality of stormwater runoff from the Port.

Stormwater runoff is the name given to the part of rainfall that 'runs off' a site, rather than soaks into the ground. Much of the land at the Port is used for buildings and storage areas for imports such as containers and motor vehicles, therefore a large component of rain hits hardened surfaces such as rooftops, bitumen and concrete. This results in high volumes of stormwater runoff.

Stormwater runoff entrains ('picks-up') sediments and nutrients that become a pollution risk for rivers and marine areas. To minimise this risk at the Port of Brisbane, we undertake significant investments to treat stormwater and reduce sediments and nutrients entering Brisbane River and Moreton Bay.



Clean stormwater runoff emerging from a collection pipe. The purpose of stormwater management is to ensure runoff is clean. *Photo courtesy of Planfuture.*

We are guided by Queensland Government Policies in our management of stormwater--one of the most important of which is the State Planning Policy, particularly the section 'State interest – water quality'. These policies require the Port to quantify sediments and nutrients that leave the Port lands in stormwater runoff and then to use best practice environmental management to manage this potential pollution risk.

Current best practice environmental management involves good planning to minimise the potential for stormwater to entrain pollutants, use of erosion controls during building and development, use of spillage management systems to ensure any accidental spillages do not enter stormwater, installation of gross pollutant traps to intercept large litter such as plastic bottles, and integrating stormwater management into engineering works through a process known as **Water Sensitive Urban Design** (WSUD).

Water Sensitive Urban Design

There are many possible WSUDs, and a number of different designs are used at the Port. Typically, WSUDs intercept stormwater runoff and 'slow it down' so that entrained sediments and pollutants deposit within the WSUD. Because grass and trees are excellent at 'slowing runoff' and increasing infiltration into the ground, these are commonly incorporated into WSUD design, with the added bonus that they also add to landscape beautification and habitat.



An installed WSUD at the Port. Sediments and pollutants in stormwater running off hardened areas (e.g. concrete) are intercepted by the vegetation, which also boost the landscape amenity of the Port.

While WSUDs are effective in controlling stormwater pollution in some areas on the Port, the majority of the port is made up of low impact land use such as storage areas with low potential to generate sediment and pollution. In these areas, WSUDs can achieve only small levels of pollution abatement. This has been determined by detailed investigations into sediment and pollution build up on port lands undertaken by researchers from Queensland University of Technology. These investigations have demonstrated relatively benign impacts from most port land uses¹. As such PBPL commissioned O2 Environmental to undertake a further study looking into viable alternatives to WSUDs on low impact sites, which generated a number of alternatives.

For these low impact development sites, PBPL is working with the State Government, strategic natural resource management experts (Planfuture), natural resource management experts (SEQC Services Pty Ltd) and the Lockyer Valley Regional Council to test an alternative best management practice known as **Offsite Stormwater Treatment**.

Offsite Stormwater Treatment

How does it work?

The environmental health of the Brisbane River at the Port and of the abutting areas of Moreton Bay is under threat from very high levels of sediment and nutrient pollution. The major source of this sediment is stream bank erosion in Creeks in the Lockyer Valley, including Laidley Creek. Historical impacts on Laidley Creek mean that the creek is unstable and large amounts of sediment enter the creek during heavy rainfall, which makes its way into Brisbane River and Moreton Bay.



Severe bank erosion of Laidley Creek, one of the major sources of sediment pollution at the Port. *Photo courtesy of Planfuture.*

Offsite Stormwater Treatment Pilot

The \$500,000 Offsite Stormwater Treatment Pilot is repairing nearly 1 kilometre of Laidley Creek's badly eroding banks with a view to reducing future sediment pollution from bank erosion and improving the quality of the Brisbane River at the Port. This investment is expected to result in much larger improvements in water quality than could be achieved by investments on land for low impact uses at the Port. The Pilot is not only a great outcome for water quality at the Port but, over time, is expected to also help improve the quality of Brisbane's water supply and reduce the amount of sediment needed to be dredged from Brisbane's shipping channels to ensure they remain navigable.



Stream restoration works comprised battering and stabilising the highly damaged banks of Laidley Creek. *Photo courtesy of SEQC Services.*



750m of battered and stabilised bank. The farmer's irrigation is being installed to expedite revegetation. *Photo courtesy of Planfuture.*



Julian O'Mara (SEQC Services) planting preferred riparian vegetation, which will increase the resilience of the restored bank as it matures. *Photo courtesy of Planfuture.*



Newly planted trees on restored bank. SEQC Services will care for these for 3 years, at which time the trees will be 3m – 8m high, further reducing the potential for ongoing bank erosion. *Photo courtesy of Planfuture.*

The Offsite Treatment investment in river restoration has many additional community and environmental benefits. The Mulgowie Farming Company—a major vegetable grower along Laidley Creek whose farms have been made more secure from flood damage—has enthusiastically welcomed the Port onto their lands and have co-invested in the restoration works. In addition, biodiversity and other environmental values of Laidley Creek will be greatly enhanced.

The Pilot also includes a major research component, with scientists from Griffith University Australian Rivers Institute, Alluvium Consulting and BMT WBM undertaking a range of studies to assess whether the Offsite Treatment will improve water quality at the Port. These studies include innovative techniques for identifying the sources of sediment pollution at the Port and will add to our knowledge of how sediment is transported through our river system. PBPL will also work with the State Government (Department of Science, Information Technology and Innovation) and the University of Queensland to monitor changes in water quality as a result of the works. Scientific assessment of the works is being overseen by a scientific committee made up of Healthy Waterways, Department of Environment and Heritage Protection, Department of Science, Information Technology and Innovation, Department of Infrastructure, Local Government and Planning and the Lockyer Valley Regional Council.

The Offsite Stormwater Treatment Pilot is the first offsite stormwater project in Queensland. The learnings from the Project will help the State Government develop an offsite stormwater treatment policy. If the Pilot is successful, the Port will continue to invest in stream restoration in the Laidley Creek over the coming decade while continuing to invest in effective onsite stormwater treatment. Savings made from discontinued ineffective onsite stormwater treatment will fund the work. It is also hoped that the Port's investments will encourage others to similarly invest in the Creek so that, over time, the Creek will once again flow clean.

The Port has developed draft guidelines for the Port Development Lands that will allow qualifying developers to invest in Offsite Stormwater treatment.



Grass cover on the restored bank less than 1 month after the completion of works.

This webpage will be updated with further scientific work becomes available.

For more information on the draft guidelines and the Offsite Stormwater Treatment Pilot, contact Senior Environment Advisor Michael Linde on 07 3258 4630 or michael.linde@portbris.com.au.

- 1- Goonetilleke, A., et al. 2009. Evaluation of pollutant build-up and wash-off from selected land uses at the Port of Brisbane, Australia. Marine Pollution Bulletin vol. 58, pp. 231-221

