the WATER & CARBON group

Sydney Olympic Park
Low Energy Leachate Treatment System
"One of the most innovative leachate solutions in Australia"

Sydney Olympic Park Leachate System

The Sydney Olympic Park Authority (SOPA) is responsible for managing all public places and sporting venues throughout the 430 hectares of parklands located in Central Sydney, NSW. The Sydney Olympic Park was home to the 2000 Olympic games and continues to attract over 14 million people annually. The area has become one of the most significant assets owned by the New South Wales Government in recent times.

PROJECT SUMMARY

The Water and Carbon Group was awarded the design and construct contract for a leachate treatment system at the Blaxland Common Landfill site, located within the Sydney Olympic park. The contract also included the provision of ongoing operational and technical support. The site was a highly contaminated landfill, where leachate presented a significant water treatment challenge. In most cases traditional treatment had proven to be extremely costly. The project was successfully completed August 2013.

20 ha
of land allocated to the Blaxland Common Landfill site.

ZERO
chemical use or sludge production in the treatment system.

<0.01mg/L
of Ammonia measured in effluent after 2 years of operation.
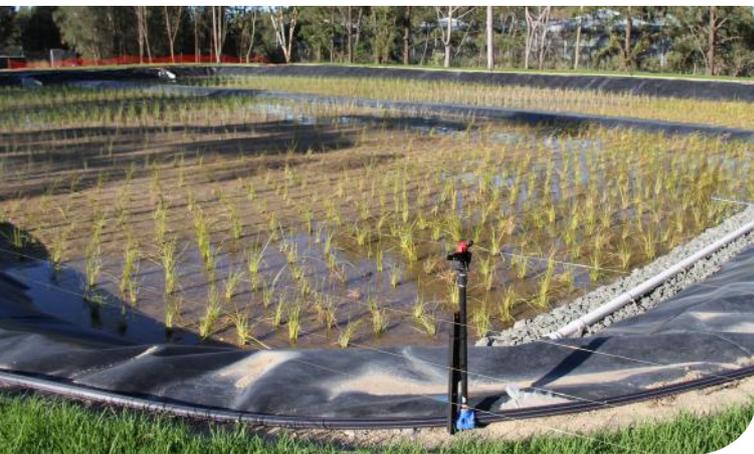
Early establishment stage of wetland cells

Wilson Park leachate treatment plant

Influent & Effluent Through Treatment Plant

Parameter	Influent Range	Effluent - May 15
TDS	1,000 - 10,000+ mg/L	1740mg/L
TSS	< 50mg/L	< 5mg/L
Oil & Grease	< 5mg/L	< 5mg/L
BOD	< 100mg/L	3mg/L
PAH	1-10ug/L	< 0.1 (ND)
TPH - (C10-36)	500 - 3,000ug/L	< 100ug/L (ND)
ph	7-8	7.64
Ammonia	50 - 300mg/L	< 0.01mg/L
Al, As, Hg, Cr, Cd	ND	ND
Pb	1-3ug/L	< 0.1ug/L
Copper	1- 40ug/L	9.8ug/L
Manganese	100- 500ug/L	6ug/L
Zinc	10- 100ug/L	< 1ug/L
Alkalinity	200- 1300mg/L	~100

BACKGROUND

The Blaxland Common Landfill site covers an area of approximately 20ha within the world-class parkland precinct of Sydney Olympic Park. The landfill comprises of domestic, commercial and industrial waste. Landfill leachate was being transported off-site for treatment at a great expense. Given the public visibility of the site, the solution's aesthetic appeal was critical.

SOLUTION

In 2012, SOPA commissioned Water and Carbon Group to design and construct a low energy passive gravel and wetland- based treatment system to treat the ammonia rich leachate.

The multi-step process designed to deliver high levels of leachate treatment included the following features::

- **Balance Tank** – to collect and balance the leachate flows and to provide preliminary aeration
- **Aeration Cascade** – a series of eight teardrop shaped concrete plates oxygenate the effluent and enable a visual check before it enters the gravel and wetland system
- **Gravel Media Cells** – to oxidise ammonia as the aerated effluent is distributed over the gravel/media cells and percolated vertically through the profile
- **Free Surface Wetland** – to provide a productive environment for microbial activity, contaminant absorption and sedimentation to complete the leachate treatment
- **Discharge Controls** – to monitor water quality and ensure objectives are met before allowing final discharge.

OUTCOMES

The system has created one of the most innovative leachate treatment solutions in Australia, providing:

- Treatment based on passive engineering/ecological systems to achieve very high levels of effluent quality;
- low energy use (power is only required for internal transfer pumps);
- no chemical use or sludge production; and the
- detoxification of leachate ammonia into inert nitrogen gas rather than transferring it to another waste-stream for off-site disposal.

Project design, construction and planting were completed in mid-2013. Once fully established, the system will treat the leachate to a final effluent quality that meets NSW EPA's environmental criteria for discharge to the environment and will enhance visual amenity, seamlessly integrating with the surrounding parkland environment. A live web cam facilitates remote monitoring.