

THE FLOW

**FUNDING OUR
STORMWATER ASSETS**

**RETENTION, DETENTION &
THE URBAN WATER CYCLE**

**TYRE POLLUTION: WHERE
RUBBER MEETS THE ROAD**

**A NEW DEFINITION FOR
GREEN INFRASTRUCTURE**



spelstormwater
joy in water



CONTENTS

04

SPEL NEWS HIGHLIGHTS

We take stock of recent developments at SPEL and news from across the stormwater sector.

06

FUNDING OUR STORMWATER ASSETS

Exploring the implementation of user-pays stormwater utility charges, we look at the ways these systems can help secure funding to implement and maintain our growing stormwater infrastructure.

07

FEATURED SPEL PROJECTS

We look at two of our newest projects – the Waurin Ponds Maintenance & Stabling Facility and our contributions to green infrastructure and stormwater harvesting in Tarralla Creek.

09

TEAM MEMBER HIGHLIGHT

We get our hands dirty with Queensland BDM Kristy Pratsch and talk about her involvement with SPEL Bio and the development of quality bioretention media.

10

A NEW DEFINITION FOR GREEN INFRASTRUCTURE

New research has proposed definitions of green infrastructure (GI) that help to clear up confusion surrounding its forms, functions, and benefits.

11

RETENTION, DETENTION & THE URBAN WATER CYCLE

Blue-green infrastructure can provide sustainable approaches to stormwater and help balance the impacts of urban development and impermeable surfaces on our natural water cycle.

12

FEATURED SPEL PRODUCTS

Checking out modern approaches to GPTs, and two key products for primary stormwater treatment – our Baffle Boxes and the Vortceptor.

14

TYRE POLLUTION: WHERE RUBBER MEETS THE ROAD

We crunch the numbers on tyre wear particles (TWP). While counting our vehicular exhaust emissions is commonplace, the ways our tyres contribute to environmental pollution is often overlooked.

15

SUPPORTING STORMWATER SHEPHERDS IN EARLY 2022

There has been some great activity at Stormwater Shepherds, and we recap some of the ways the charity is helping raise awareness for stormwater management.

Joy in water

Clean water is a right, not a privilege.



spelstormwater
joy in water

1300 773 500 | spel.com.au



A NOTE FROM OUR CEO

ANDY HORNBUCKLE, CEO



SUSTAINABILITY, STORMWATER & INNOVATION

SPEL Stormwater believes in preserving the Joy in Water experience and providing the infrastructure to secure a cleaner water future for all - for you with your children and their children. Stormwater treatment is an ever-changing sector, and we constantly seek innovative approaches to water quality, quantity, and conveyance scenarios.

We are excited to release new products and produce them locally – from fibreglass devices in our FRP manufacturing facility in Sydney to our expanding range of on-site stormwater detention tanks (OSD) produced in Brisbane.

Stormwater systems help our communities retain their resiliency in the face of climate pressures, increased storms, and a growing population. They provide flood mitigation, pollution reduction and scalable solutions that future proof our approach to stormwater.

It is our job to ensure that these generational assets are designed to last, manufactured for quality, and provide high performance across their service life.

MAINTAINING MODERN STORMWATER ASSETS

Blue-green infrastructure helps incorporate sustainability into our communities. In this issue, we look at these approaches to stormwater design and their intersection with contemporary urban development.

Helping us retain our natural water cycles, ensure water quality outcomes, and improve the liveability

of our urban landscapes, these blue-green systems are an important part of our water future.

As our urban centres grow, we place more demands on our stormwater networks, and these eco-friendly systems are part of the solution – partnering green space, public amenity, and stormwater treatment.

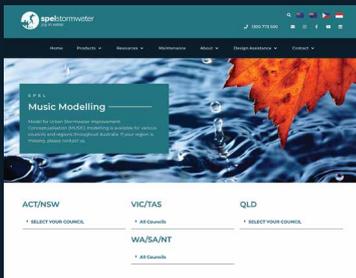
Maintenance and funding are integral to the viability and performance of stormwater infrastructure. As we develop new systems, our funding and ability to maintain them needs to continue to grow.

This magazine investigates user-pays models for stormwater funding, which has also been the focus of one of our recent webinars and an important topic in the stormwater sector. These funding models are already in place across the world and help to raise the necessary capital to maintain our stormwater assets.

By creating jobs in this sector, improving our knowledge, and raising awareness, we can all play a part in developing stormwater assets for ourselves, and future generations.

SPEL

HIGHLIGHTS



MUSIC NODES: UPDATED & AVAILABLE ONLINE

Model for Urban Stormwater Improvement Conceptualization (MUSIC) nodes for our products are available for all Australian states and territories. These allow the correct visualization of stormwater assets for SPEL devices and represent their specifications relevant to local hydrology and catchment areas.

MUSIC modelling is a valuable tool across the stormwater sector. SPEL also provides complimentary design assistance, and can help you with your MUSIC modelling, engineering calculations, and appropriate structural guidance.



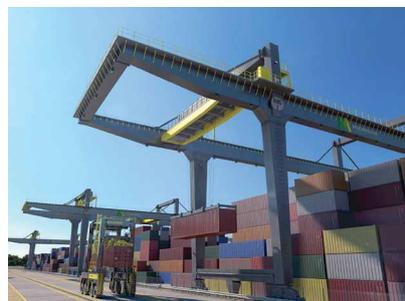
SPELBASIN & SPELFILTER: APPROVED IN AUCKLAND

With the **SPELFilter** and **SPELBasin** now approved for use in Auckland, we look forward to continuing to supply sustainable stormwater solutions in the region.

A highly advanced stormwater filtration system, the size and versatile design of the SPELBasin

make it an ideal approach to stormwater treatment trains – with a much smaller footprint than a conventional GD01 rain garden.

The SPELFilter has also gained approval. An industry leading approach to cartridge filtration, these units provide excellent pollution removal efficiencies and configurations that can be optimized to suit your on-site requirements.



100TH VORTCEPTOR: SHIPPING TO MOOREBANK INTERMODAL

We celebrate the installation of the 100th **Vortceptor**, which left our yards in mid-June for the Moorebank Intermodal. Servicing large catchment areas across the site, the Vortceptor will help improve local water quality outcomes and ensure environmental compliance across this national piece of transport infrastructure.



ACT: VORTCEPTOR APPROVED FOR GOVERNMENT MAINTAINED SITES

Providing high-performance water quality outcomes, the SPEL Vortceptor has received approval for use on government-maintained sites across the ACT.

Single-piece fibreglass design, low carbon footprint and lightweight properties provide key on-site benefits, and these devices can be scaled to suit the size of on-site catchments.



NEW SPELVault DEVELOPMENTS

Expanding our range of on-site stormwater detention tanks (OSD), the SPELVault system is now available in two new innovative configurations – providing an industry-leading answer to medium to large detention scenarios.



SPELVault: READY & DOUBLE-STACKED

The SPELVault is now available in a double-stacked configuration, which allows the placement of tanks in a vertical two-layer design. With greater depth and smaller footprint, these on-site stormwater detention (OSD) tanks are designed for superior structural outcomes.



LARGE DETENTION SCENARIOS: THE SPEL MEGAVault

Our production facility in Brisbane, Queensland, has manufactured our first line of SPEL Megavaults – which are currently being installed in projects across South East Queensland, New South Wales and Victoria. Released earlier this year, these OSD solutions are now preparing for shipping, and offer condensed footprint, cost-efficient construction, and easy installation.



FUNDING OUR STORMWATER ASSETS

Most Australians live in our urban centres, and our need for stormwater management is ever-growing. Protecting our environment is part of a sustainable water future. Stormwater infrastructure plays an integral role in reducing pollution, mitigating flooding, and increasing liveability.

Impermeable surfaces, such as roads, paths, and car parks, carry water across our urban landscapes. This conveys increasing amounts of pollution to our waterways and increases our reliance on our drainage systems.

We need to create stormwater assets and retrofit existing stormwater infrastructure to continue to meet our burgeoning demands. These are crucial to protect our environment and communities – and protect our downstream waterways, lakes and oceans.

Stormwater assets often lack priority in local budgets, which can lead to funding that runs rich and lean. How do we improve available funding for these vital stormwater systems?

BUILDING A FAIR UTILITY CHARGE

Stormwater management needs assets that are well-funded, maintained and upgraded as technology changes – utility charges for stormwater ensure adequate funding is earmarked for these programs.

These charges are based on fair user-pays models, often billed as ‘the more you pave, the more you pay,’ where property owners are charged a fee that is in line with the amount of impermeable surfaces, area of the property and quantity of stormwater conveyed.

Key benefits to an equitable utility charge include stable, sufficient, and flexible funding. Communities pay for their stormwater utility use on a property-by-property basis, and all meaningfully contribute to keeping these systems in optimal condition.

Stormwater utility charges allow the funding for our stormwater network to scale with demand – from small towns to the largest of cities.

Our imminent need for stormwater infrastructure is reflected globally, and many countries like Germany, US, and Canada, are adopting stormwater utility charges with similar operation to existing sewer and water utilities.

Property assessments for stormwater are constantly improving. The ability to gauge impermeable surfaces using satellite imagery and GIS data is creating innovative approaches to the generation of stormwater data. These allow utility charges to effectively factor in contemporary urban design and sustainable infrastructure.

Importantly, this allows cost-benefit to be increased for properties adopting best-practice stormwater management – such as the incorporation of blue-green infrastructure, permeable surfaces, and stormwater treatment.

WAURN PONDS MAINTENANCE & STABLING

POLLUTION REMOVAL FOR VITAL RAIL ASSETS

The new Waurn Ponds train maintenance and stabling facility will provide the infrastructure needed to service many of the Geelong region's important rail assets. It will allow trains to be housed and maintained while out of operation, with the capacity to store and refuel six trains. The new facility is needed to support additional services on the Geelong train line.

The Geelong Line is the busiest on the regional rail network, and its ability to provide frequent and reliable train services will be enhanced. This important piece of rail infrastructure will support other projects on the line, including the completed Waurn Ponds Station upgrade, South Geelong to Waurn Ponds Duplication and the future Geelong Fast Rail. SPEL Stormwater is fortunate to be part of the journey.

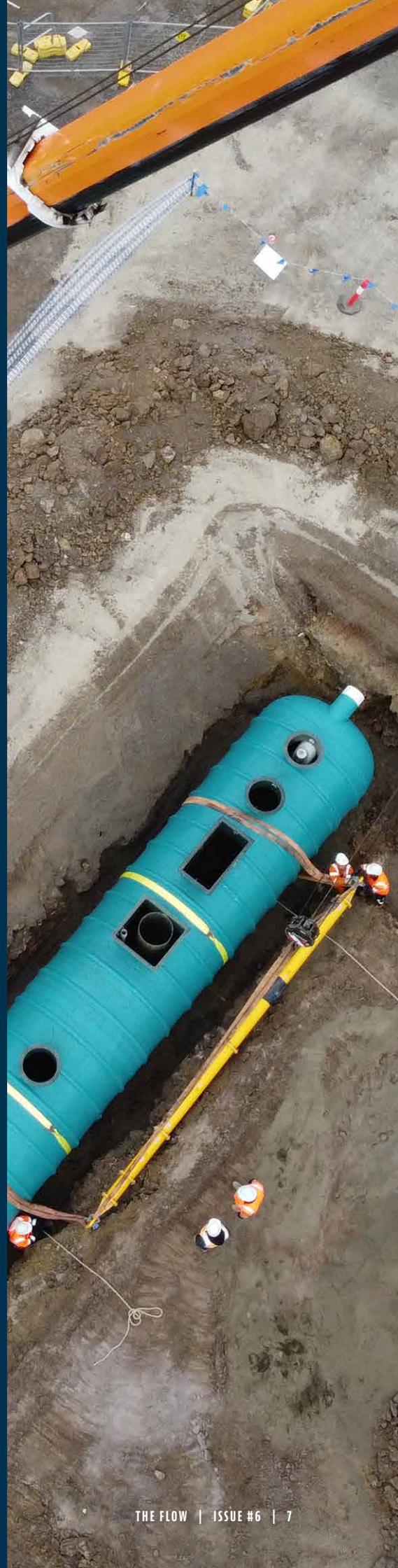
ENSURING ENVIRONMENTAL OUTCOMES & HYDROCARBON CAPTURE

Two SPEL Puraceptors were installed across the facility to provide high-risk hydrocarbon spill capture across six stabling tracks. With catchments containing both the stabling and refuelling yards, these stormwater assets provide the ability to treat hydrocarbon runoff to ensure compliance with key environmental policy and maintain water quality outcomes.

With 100-year design life and 25-year on-site warranty, the Puraceptor is fit-for-purpose in high-risk scenarios and ensures hydrocarbons are captured during all flow and spill conditions. The two-chamber design, coalescer and no-bypass design provide a high degree of oil and water separation - reducing light liquid content at the outlet to 5mg/litre.

Ensuring stormwater safety, these assets are easy and safe to maintain, and the built-in flame-trap ensures that inflammable vapours and fires are unable to pass through to the drainage system.

These devices will help future proof the site's water treatment objectives and maintain clean water discharge during rainfall events. The Puraceptor exceeds EPA standards, ensuring the local environment is protected and potential contaminants are removed from subsequent water networks and prevented from entering nearby waterways.





STORMWATER HARVESTING IN TARALLA CREEK

A recreational hotspot in Melbourne's Croydon, Tarralla Creek is an important community area that borders several local playing fields and contains amenities such as its 10-kilometre bike trail and large creek reserve.

To enhance liveability in the area, the Reimagining Tarralla Creek project began in 2020, and has transformed a 500-metre section of Tarralla Creek and Croydon Wetlands into a naturalized green space.

The project was continued into 2022 to improve water sustainability with the implementation of stormwater harvesting solutions to irrigate nearby sporting areas. Contemporary urban design and landscaping have enriched the site and improve the health of the waterway and surrounding environment.

Part of the Integrated Water Management Program, by the Department of Environment, Land, Water & Planning, this initiative looks to create better outcomes for communities through collaborative approaches to planning and managing our water cycle.

13 MEGALITRES: WATER HARVESTING IN TARRALLA CREEK

SPELChamber was supplied and implemented to capture, treat, and re-use water across the site. This irrigation system will supply water to four separate sporting facilities and parks – Fred Geale Oval, Croydon Oval, Springfield Park, and Town Park field.

Minimising reliance on potable water, the SPELChamber supplies the detention and re-use capabilities required by the large catchment – and helps to reimagine environmentally-friendly water use across the unique site.

Incorporating 1 megalitre of stormwater harvesting capacity, this infrastructure supports a long-term vision for eco-friendly design across the reserve. Capturing runoff that coalesces in the site's stormwater drainage network, the project is expected to save over 13 million litres of water per year.

Stormwater harvesting allows the collection of rainwater from a variety of impermeable surfaces, such as carparks, roads and footpaths. As an alternative to mains water, stormwater harvesting results in the alleviation of pressure on the water network – and the ability to help restore natural water cycles in the urban environment.

Providing resilience to climate change, and addressing the needs of a growing local population, this stormwater solution will future-proof the surrounding area and help to create better water outcomes in the local area.



Q&A WITH KRISTY PRATSCH

With over two decades of experience in the stormwater industry, Kristy Pratsch is SPEL’s Business Development Manager for Bioretention, currently developing this product as part of our Queensland team.

Kristy formally joined SPEL in March 2021 to develop and produce sustainable, high-performance bioretention media for stormwater systems.

WHY IS GREEN INFRASTRUCTURE IMPORTANT?

I take inspiration from traditional landowners and their connection to our land. Generations pass down cultural practices and solutions to maintain the environment and live harmoniously. I would like to pass on values and traditions like this to my kids, and future generations, to retain connections with the environment and our local community.

It is important to have a connection between naturalised stormwater infrastructure and inviting community space. Slowing down water flows, utilising natural vegetation and creating beautiful open spaces... It is a great way of connecting the community with the environment.

WHERE DOES YOUR INTEREST IN BIORETENTION COME FROM?

Even as a little kid I had a compost patch in the backyard. I have always been obsessed with gardening and turf, and to me the compost patch was this wondrous miracle – you can throw all your veggies, and grass clippings in, and you can make a beautiful ameliorant to go into soils. It helps plants grow, diverts waste from landfill and sustains our gardens.

Over the years, I have been involved with turf, and composting – and bioretention is the perfect union of these core concepts. My work at SPEL lets me put this into a comprehensive bioretention product (SPELBio).

HOW DOES SPEL ALIGN WITH YOUR VALUES AROUND WATER & ENVIRONMENT?

One of the things I really appreciate about working at SPEL is our commitment to lifelong learning. Many companies pay lip-service to investing in their team, but I’ve never worked anywhere quite like SPEL where they take the time to train you in-house.

Currently studying an MBA, they actively play a support role in my study – and this aligns with my values as a lifelong learner. I get to apply learnings about sustainability and making an impact through innovation – SPELBio for me is my contribution toward UN Sustainable Development Goals.

When it comes to the environment, SPEL helps me be part of Stormwater Shepherds and give back to the community through clean-up days and engage in projects that support our environment.

WHICH STANDOUT PROJECTS HAVE YOU BEEN A PART OF?

Since working at SPEL, I have been able to engage in commercial projects in the Toowoomba region. These encompass large infrastructure like hospitals and the transport sector. We have been able to incorporate bioretention in stormwater treatment configurations to improve water quality outcomes on-site and to ensure site operators comply with key environmental policies.

WHAT ARE YOUR INTERESTS OUTSIDE WORK?

Golf, golf, golf... I am obsessed with golf. I love spending time with my family and friends, cooking food and helping in the community. Did I mention golf?

Learn more about Kristy’s work with SPELBio in ‘Bioretention – Beyond the Specification’, available on-demand in our SPEL Webinar series.





A NEW DEFINITION FOR GREEN INFRASTRUCTURE

Green infrastructure (GI) has become an important part of urban planning for our city landscapes. These developments help our communities build environmental sustainability and resilience, while providing impressive cost benefit – from increased liveability to flood mitigation.

However, a recent study in *Frontiers in Ecology and the Environment* shows that while we have embraced these philosophies – the definition of green infrastructure is often unclear.

Across 120 US cities examined in the research, it was found that approximately 40% of development plans for green infrastructure projects did not explicitly define the term, and over 50% defined the term differently.

Confusion around this impacts funding distribution, uptake, and feasibility.

The study noted many diverse types of GI present in modern cities - including natural habitat, trees, parklands, bioretention, stormwater facilities, blue-green corridors, and green roofs.

With a diverse need for environmental interventions, green infrastructure is implemented in a range of project plans. They provide social, environmental, economic, and ecological benefits – and the report shows the need for these frameworks to be reflected in our definition of GI.

GI: ENGINEERING A NEW DEFINITION

As we future proof our cities, green infrastructure is pushing sustainable thinking forward. Stormwater assets may be included in naturalized solutions, such as bioretention in parklands, or as part of engineered proprietary solutions.

Moving towards a clearer, consistent, and inclusive definition for GI helps open the door for better understanding, implementation, and planning. Rather than framing green infrastructure as an engineered or ecological solution, the report advocates for a definition that

encompasses the scope of modern green infrastructure, as follows -

“a system of interconnected ecosystems, ecological– technological hybrids, and built infrastructures providing contextual social, environmental, and technological functions and benefits. As a planning concept, GI brings attention to how diverse types of urban ecosystems and built infrastructures function in relation to one another to meet socially negotiated goals.”

With narrow definitions, we risk these assets competing for viability in our urban landscape – when many of the best outcomes are achieved by ensuring diversity in urban planning and providing the budget, policy, and workforce to adopt varied solutions.

Moving forward, an inclusive definition of green infrastructure is needed, and this research is helping move the conversation towards common ground.

<https://esajournals.onlinelibrary.wiley.com/doi/10.1002/fee.2445>

RETENTION, DETENTION & THE URBAN WATER CYCLE

URBANISATION & IMPERVIOUS SURFACE

The urbanisation rate in Australia from 2010 to 2020 shows that 85% of the Australian population lives in cities.*

As our cities grow, so do impervious surfaces such as roads and footpaths. These reduce rates of water infiltration and increase surface run-off.

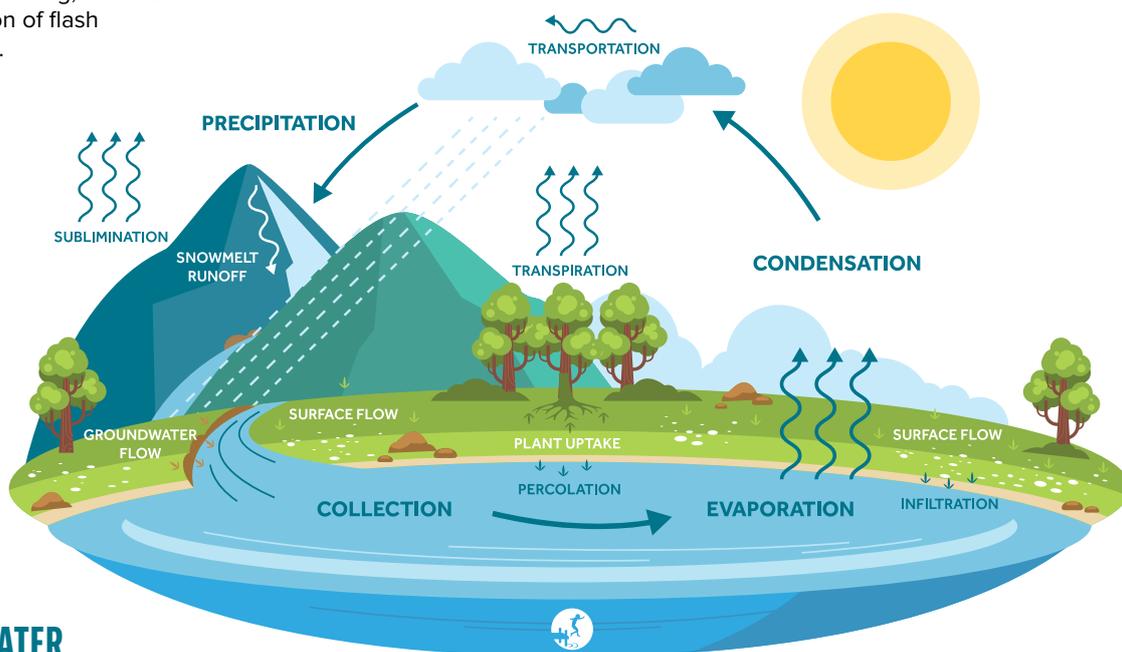
Understanding the direct relationship between impervious surfaces and stormwater runoff is important for urban planning, and the mitigation of flash flooding.

When precipitation occurs, it moves via these different routes. A proportion of the rainfall becomes surface water, travelling to oceans and lakes via tributary streams which flow into larger river systems.

The rapid growth of urbanisation in Australia combined with increased rain events has been a major contributor to flooding. Impervious cover and urban drainage systems increase runoff speed, which transports pollutants and sediment into our waterways.

SPELChamber is an example of this form of infrastructure. An inground modular arch system, it is used for onsite detention, retention and infiltration. This system was recently constructed at [Turner Bus Layover](#) in the ACT to prevent frequent flooding and disruption to traffic flow.

The system holds up to 2 million litres of water and will release the water slowly once rainfall subsides. This project combined grey and green infrastructure with landscaping, trees and pervious footpaths to help restore natural filtration.



HOW THE WATER CYCLE WORKS

The water cycle, also known as the hydrological cycle, is constantly moving and is the continuous exchange of water between land, water bodies, and the atmosphere.

Essentially, there are seven key components of the water cycle - evaporation, condensation, precipitation, interception, infiltration, percolation, transpiration. Associated factors include runoff and storage.

In highly urbanised areas over one-half of the rainfall becomes surface runoff and there is less infiltration compared to the natural water cycle.

Sustainable approaches to bringing back the natural balance of stormwater infiltration can be achieved through blue-green solutions and infrastructure. One way is to implement modern stormwater detention systems.

Other ways of restoring natural filtration are by creating blue infrastructure, ponds, floodplains, and floating wetlands. For example, the [SPEL Floating Wetland](#) recently constructed at Lake Tuggeranong as part of the ACT Healthy Waterway Program.

As our cities grow it is important that urban planning implements blue and green infrastructure to reduce and mitigate the impacts of flooding and emulate the natural filtration process to create a balance in the water cycle.

* <https://www.statista.com/statistics/260498/degree-of-urbanization-in-australia>

SAVING WATERWAYS: GROSS POLLUTANT TRAPS

Gross Pollutant Traps (GPTs) are important frontline defenders that screen stormwater and protect waterways from solid waste and litter – with various configurations available to remove a wide range of pollutants.

Modern GPT designs offer versatility, including the capacity to remove many types of contaminants including sediments, silt, total suspended solids, nutrients, and oil & grease.

This pollution is prevented from conveyance through catchment areas and is captured before it reaches our rivers and ocean environments. Gross pollutants, including plastic pollution, are removed from our drains and subsequent parts of our stormwater network.

GPTs can be installed independently, or as stormwater pre-treatment that work in conjunction with secondary and tertiary devices. They are often used to compliment stormwater devices downstream, which play vital roles, for example filter cartridge systems, oil and water separators, and on-site stormwater detention.

MAINTENANCE: CLEAN SCREENS & CLEAN STREAMS

Maintaining stormwater assets is imperative. Often out of sight, GPTs require routine inspection, cleaning, and maintenance to ensure they are performing optimally – and to prevent costly failures or premature decommission.

The frequency of these maintenance schedules depends on several factors, including the size of the catchment, the volume of stormwater runoff, and pollutant load. Maintenance ensures peace of mind. Not only are surrounding waterways protected from the detrimental impacts of untreated stormwater, but the service life of our stormwater assets is improved.



BAFFLE BOX: RETROFITS & PUBLIC EDUCATION

Baffle Boxes are popular GPTs that are highly effective at removing sediment, suspended particles, and associated pollutants from stormwater. These devices are perfect for retrofits and compatible with many drainage systems.

Using a series of chambers separated by baffles, their design allows pollutants to settle and separate from stormwater. Often accompanied by trash screens or skimmers, their pollution removal capabilities can be extended to include larger pieces of rubbish, floating debris, and vegetation.

These devices are often retrofitted into existing stormwater pipes or treatment designs, which help future-proof drainage systems in our urban environments.

One of the drawbacks to the installation of a Baffle Box is their high visibility and ability to raise awareness of key stormwater treatment processes. Baffle Box installations are often accompanied by **public observation covers** allowing people to see the inner workings of the device.

Ultimately, providing these opportunities for community education can help change hearts and minds. Curious members of the public can see these devices in action and learn about their capabilities from educational signage, which helps establish healthier mindsets when it comes to treating stormwater and protecting our waterways.

KEY BENEFITS

- Adaptable: Ideal retrofit capabilities
- Viewing windows: Community education & awareness
- Quick & easy to install





APPROVED FOR GOVERNMENT MAINTAINED ACT SITES

The SPEL Vortceptor is an industry-leading Gross Pollutant Trap (GPT), manufactured using an innovative single-piece fibreglass design, with excellent pollution removal and stormwater treatment capabilities.

Now approved for use on government-maintained sites across the ACT, this innovative generational asset features both 100-year design life and a 25-year warranty.

Sustainable, lightweight, and low carbon footprint, the Vortceptor is a versatile device that can be scaled for application across a wide range of on-site requirements.

Incorporating lightweight properties and a low carbon footprint, the design can be scaled for different catchment sizes. With the ability to place these units back-to-back, their flow capacity can be sized up to 3,200 litres per second.

The modern gross pollutant trap design incorporates self-cleaning screen technology, which prevents clogging or binding of sediment to the same degree as a traditional device.

Using low vortex conditions, the Vortceptor performs above key industry benchmarks for pollution removal. This stormwater system has been rated at 70% removal of TSS (Total Suspended Solids) and 99.9% capture of Gross Pollutants, which places them above key industry performance benchmarks.

The maintenance of the SPEL Vortceptor is fast and convenient, and able to be performed with a vacuum truck. Its design allows the removal of sediment and debris without personnel entering the GPT and delivers low overheads across its service life.



KEY BENEFITS

- Lightweight: Single-piece fibreglass design
- Sustainable: 100-year design life
- Easy maintenance: Self-cleaning screen technology





with high amounts of TWP, but more research is needed to quantify this danger.

PUTTING THE BRAKES ON TYRE POLLUTION

Tyre wear pollution creates dust that travels far and wide. Ten percent of this particulate is carried through our air, while the other ninety percent falls close to roads and is then carried by stormwater to our riverways and oceans.

Our ecological systems are exposed to these pollutants, with the most common risks being ingestion and contamination. Particularly in aquatic environments, animals may ingest microplastic or encounter toxic compounds – for example, small fish. These are passed on to the larger predators that eat them in a process called bioaccumulation, which moves all the way up our food chains.

By improving the stormwater treatment of roadway runoff, particularly around developments with high vehicle loads, we can begin to filter tyre wear sediment and collect it before it has a chance to enter our natural environment.

Many stormwater devices have high pollution removal and sediment capture - including vortex separators (Vortceptor), oil & water separators (Purceptor), stormwater basins (SPELBasin), and floating wetlands.

Research into low environmental impact tyre compositions can help reduce TWP. New tyre designs can incorporate sustainable options that improve wear resistance and durability.

Personally, we can minimize the production of tyre wear pollution by using our cars sustainably, carrying lighter vehicle loads, and ensuring the maintenance and replacement of our car tyres before they fragment excessively.

Local councils and governments can also ensure that our roads are kept in good condition, which helps to minimize the road wear our tyres take on our motorways. They say the 'road to success is always under construction' and we all need to take steps to minimise TWP, raise awareness, and protect our environment.

TYRE POLLUTION: WHERE RUBBER MEETS THE ROAD

We are used to considering the pollution that comes out of our car exhaust – however, the impacts of tyre wear and the breakdown of vehicle braking components is often overlooked.

Cars travelling at high speeds, accelerating, or braking suddenly all emit tell-tale indicators of tyre loss, such as smoke and screeching tyres. However, for most of our daily driving, our tyre emissions are not as conspicuous.

As our tyres grip the road they constantly shear, leaving behind a microscopic trail on our roadways. Once in the environment, tyre wear particles (TWP) disperse over large distances and are carried by stormwater into our riverways and oceans – with the potential for disastrous environmental impacts.

Over 20 million motor vehicles are registered in Australia and this number is growing.

Harmful particulates from tyres and brakes are being held under the microscope, and research shows that an average tyre sheds an estimated 1 to 4 kilograms of fragmented particles over a 30,000km life. This equates to a staggering 4 to 16 kilograms for

every set of tyres fitted to our vehicles. Tyre and road wear particles are a growing area of research, and unlike exhaust emissions, these particulates escape regulation by our modern environmental policies.

MANMADE RUBBER: MODERN CAR TYRES

Tyres have gone through design iterations throughout our history, from leather, stone and wood to the natural rubber designs that dominated until the early 1900s. With the discovery of synthetic rubber in 1909, it didn't take long to incorporate these substances into the running gear of our cars.

In the tyres of modern passenger vehicles, natural rubber has taken a backseat to higher ratios of synthetic rubber. Locally, VicRoads reported the average composition of our passenger car tyres as 16% natural polymer and 29% synthetic polymer. However, truck tyres still use a higher ratio of natural rubber (29% and 13% respectively).

The fragments of tyre pollution that escape into the environment are largely 'microplastics'. These join a growing number of these substances in our environment, including polyester fibres, microbeads and plastic pellets. Many of these come from manufacturing, consumer products, and packaging. Microplastics have been found across the planet – from deep oceans to polar ice caps.

The breakdown of the other parts of our tyres, which are a mix of steel, fillers and curing agents, also creates a cocktail of toxic compounds. Elevated levels of zinc and dangerous organic compounds have been found in areas

STORMWATER SHEPHERDS

HIGHLIGHTS



STORMWATER SHEPHERDS

KEEP AUSTRALIA BEAUTIFUL LITTER CONGRESS 2022

Stormwater Shepherds presented at this year's KAB Litter Congress, sharing important insights into the impacts of untreated stormwater and the ways it conveys pollution from our catchments to our waterways. Incorrectly managed stormwater carries litter, sediment and pollutants that affect everything downstream – from the smallest organisms all the way up our food chains.

BECOMING A FRIEND OF STORMWATER SHEPHERDS

Support Stormwater Shepherds with their work improving stormwater management, stopping pollution at the source and ensuring we all have access to clean waterways and rivers. They would love for you to [become a friend](#), [support river clean-ups](#) or [volunteer locally](#). Help save our riverways and oceans and protect our precious ecosystems. Tax-deductible donations are also available!



stormwatershepherds.org.au

SPEL supports Stormwater Shepherds and their goals of creating and sharing resources for stormwater education & awareness. We embrace Joy in Water, and the ways we can protect our precious waterways and ensure a cleaner water future for all.

Awareness is essential. We need to change attitudes around stormwater, and ensure we are doing all we can to stop pollution at the source – by removing it at our catchments.

UNMANAGED LITTER & ITS EFFECTS ON LIVING BEINGS



The effects of unmanaged litter have impacts across our ecosystems and affect a multitude of living creatures. Starting in our urban landscapes and transported to our catchments, Stormwater Shepherds investigates the downstream effects of microplastics, litter and tyre-wear pollution in their newest [Green Paper](#).

RYDE COUNCIL SUSTAINABILITY FESTIVAL

Promoting sustainable living, waste reduction, and biodiversity, Stormwater Shepherds took part in the [2022 Ryde Sustainability Festival](#). Stormwater Shepherds Mary Rayner took workshop attendees on a journey through aquatic environments to explore the impacts of untreated stormwater.

ON-DEMAND WEBINAR: STORMWATER SHEPHERDS INVESTIGATES STORMWATER FUNDING MODELS

Education is a core part of Stormwater Shepherds' work, which includes their feature in our March webinar - New & Innovative Funding Models for the Correct Management of Stormwater Assets with Stormwater Shepherds Mary Rayner, and guest speaker Dr Victoria Kramkowski. [Available on-demand on our website.](#)



STORMWATER SHEPHERDS



STORMWATER



IMPACTS



EFFECTS



MICROPLASTICS



SOLUTIONS

STOPPING STORMWATER POLLUTION AT THE SOURCE



PLEASE SUPPORT STORMWATER SHEPHERDS

Stormwater Shepherds are an environmental not-for-profit committed to restoring health to our waterways by stopping plastic and urban pollution at the source & helping all lifeforms to enjoy clean water for future generations.



SPEL IS A PROUD SUPPORTER
OF STORMWATER SHEPHERDS

Your support through donations and purchases in our online store help towards:

Positive Action – purchasing equipment for community clean-ups

Sharing Knowledge – informing and researching the latest pollution facts and its effects on all lifeforms

Advocacy – working with councils and governments nationwide on the importance of well-managed stormwater

Get involved at
stormwatershepherds.org