SPEL ENVIRONMENTAL
INTEGRATED WATER SOLUTIONS

Floating Treatment Wetlands

Water treatment system made out of recycled PET bottles.

A proven and efficient FloatingTreatment Wetlands (FTW) Stormwater & Wastewater Treatment System

For your interest: Approximately 139 x 500ml PET bottles per 1sqm of SPEL FTW

NEW ZEALAND PROJECT COMMISSIONED

PLANT GROWTH AFTER 12 MONTHS

FTW Process Flowchart

STEP 1

PET bottles
Assembly line for recycling.
USA

STEP 2

Recycled PET flakes
Ready for processing.
Georgia, USA

STEP 3

PET Bottles
PET Bottles processed into FTW Matrix.
Georgia, USA

STEP 4

Recycled PET matrix
Shipped to New Zealand and manufactured into SPEL FTW.
Auckland, New Zealand

STEP 5

Can be used for treating cane farm runoff in canals & streams.

STEP 6

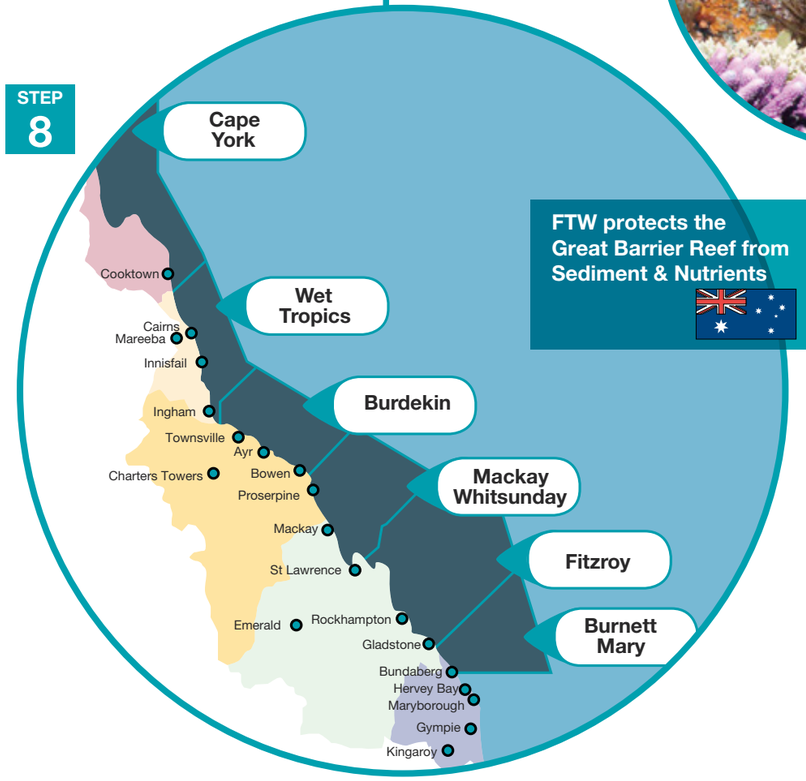
Can be used for treating sugar mills & abattoir wastewater.

Using recycled PET Drink Bottles to save the Great Barrier Reef
SPEL FTW
Sengkang Wetlands
Sungei Punggol
Singapore.

STEP 7

Protects GBR from fine suspended Solids & Nitrogen

STEP 8



FTW protects the Great Barrier Reef from Sediment & Nutrients

How FTW Works?

A proven and efficient
Floating Treatment Wetlands (FTW)
Stormwater & Wastewater
Treatment System

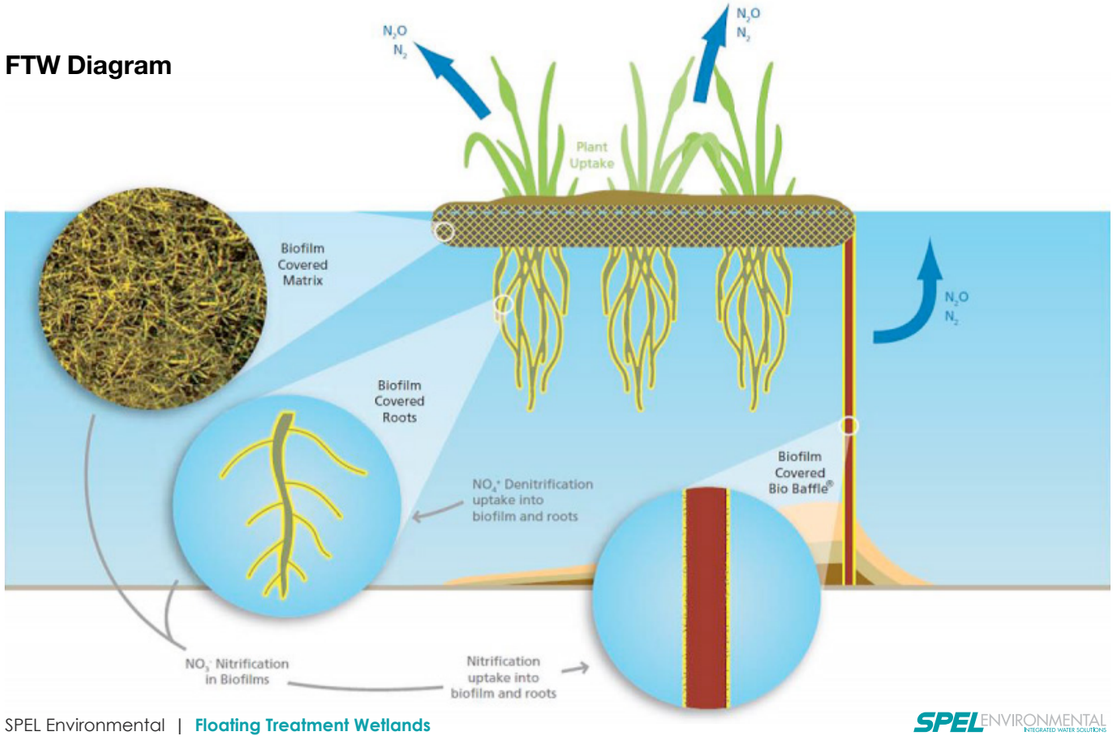
The floating wetlands, which can be used in any water environment requiring treatment, provide a lush and fertile base for plants and vegetation to grow. As the roots spread down through the fibrous structure of the wetlands, an extraordinarily vast activated surface area is created for microbes and bacteria to take on their role of bio-remediation - the use of micro-organisms to remove pollutants.

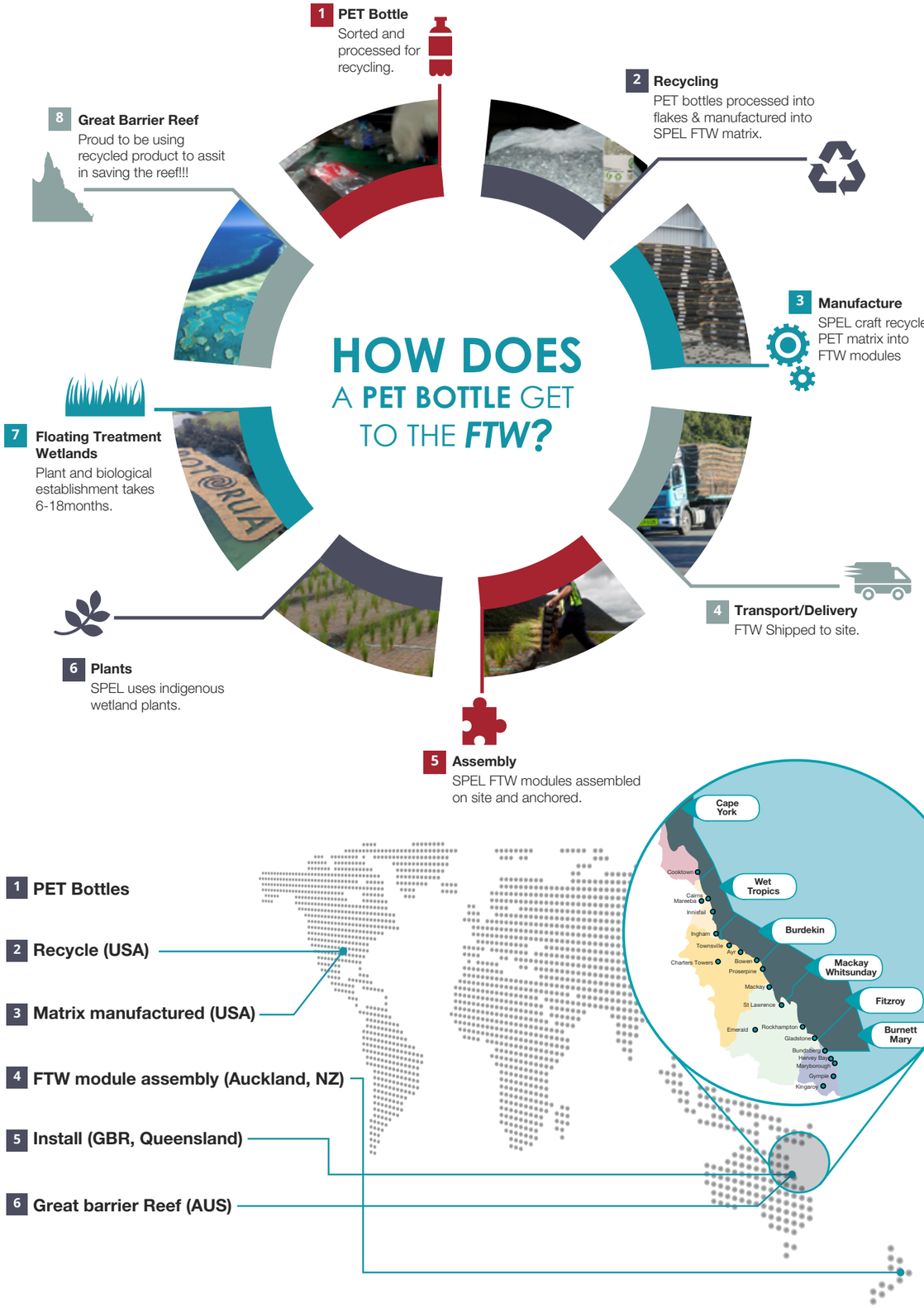
The microbes and bacteria, are UV sensitive and adhere to the roots and microscopic root hairs of the plants, and within the fibrous structure of the wetlands themselves, secreting sticky extracellular proteins and exist in the environs of biofilms.

It is within these biofilms which microbes and bacteria trap and digest organic matter and nutrients in stormwater, including total suspended solids, biochemical oxygen demand, nitrogen and phosphorus.

What makes SPEL Environmental's floating treatment wetlands a unique scientific innovation, that has created a revolution within the water treatment industry, is the massive activated surface area they provide for microbes and bacteria to survive.

FTW Diagram





Company Introduction

With more than 45 years' experience in the design, testing and manufacture of water treatment systems that are utilised in over 45 countries.

Removing pollutants from water is an ongoing challenge for communities worldwide. As environmental regulations increase, cost-effective and high-performing solutions to remove contaminants become integral.

At SPEL Environmental, we draw on more than 45 years' experience in the design, testing and manufacture of water treatment systems that are utilised in over 45 countries.

International Experience

SPEL manufactures solutions in Australia, New Zealand, the United Kingdom and USA, and licenses several international technologies. All products are designed and manufactured to comply with relevant industry standards. SPEL Environmental and its international partners are involved in ongoing field and laboratory testing of our products to independently verify performance.

Our products have been designed for and installed in the following applications:

- Mining
- Petroleum industry
- Energy
- Defence
- Air, sea and land transport infrastructure
- Commercial and residential developments

Efficient products, Tailored service

Our focus is on providing highly efficient treatment products for stormwater and wastewater applications. Our unique combination of technical experience and product design provides to our customers an organisation that includes:

- Engineering Design
- Manufacturing
- Installation
- Onsite Supervision
- Commissioning
- Operational monitoring and
- Maintenance

SPEL Environmental treatment solutions vary from systems based on proven engineering principles through to flexible biological processes. Our diverse range of products provides our customers with various options to achieve their water quality objectives to suit their budget and site constraints.

Accreditation

At SPEL Environmental, we do not just speak about our commitment to the environment, we take action to ensure a better future for our families, friends and everyone.

We are constantly looking to improve our products and services to bring more value to our clients and their projects. We also engage with reputable industry partners to ensure better industry standards and organise frequent conferences.

Remember at SPEL Environmental, we are the water specialists.

Quality Products & Systems

Our commitment is unmatched in the industry and is constantly improving our products and services as demonstrated by our ongoing accreditation for Quality and Environmental Management.

IS09001:2008 CERTIFIED COMPANY

Quality

IS014001:2004 CERTIFIED COMPANY

Environmental

Industry Partners

Our industry experience and expertise in providing high-quality water solutions has enabled us to obtain preferred-supplier status with many councils and government authorities around Australia, New Zealand, UK and other countries.

eWater

Griffith UNIVERSITY

CRC for Water Sensitive Cities

waterclean technologies

AHSCA The Association of Hydraulic Services Consultants Australia (NSW) Inc

NSW Public Works Manly Hydraulics Laboratory

QUT

Modular Wetlands

Stormwater Australia

UDIA Urban Development Institute of Australia Queensland

University of the Sunshine Coast

University of South Australia

FTW Overview

SPEL's unique biological Floating Wetlands can be retrofitted to existing ponds and other areas of water.

In wastewater applications, floating treatment wetlands have proven efficient and low-cost enhancements to municipal wastewater treatment plants — either retrofitted to existing facilities or encompassed into the design of new constructions. Truly environmentally sound and sustainable, the SPEL floating treatment wetlands have a dramatic effect on:

- Anaerobic digestion
- Odour mitigation
- Nitrification processes
- De-nitrification and polishing
- Bio-chemical oxygen demand
- Removal of TSS
- Reduction in faecal coliforms
- Reduction in phosphorus

In stormwater applications, the installation of floating wetlands into inlet zones or detention lagoons greatly enhances the stormwater cleaning process by removing:

- Total suspended solids
- Nutrients
- Gross pollutants
- Heavy metals
- Fine colloidal and particulates

Independently tested and validated, these systems provide high-rate performance in both average flow and storm events.

APPLICATIONS
Stormwater Treatment
Beautification and Landscaping
Lake and Pond Restoration
Waste Water Treatment
Lagoon Augmentation
Fine Colloidal and Particulate Heavy Metal Removal
Algal Bloom Prevention

Benefits

SPEL Environmental's floating treatment wetlands offer clear benefits to any organisation or individual requiring wastewater treatment including local authorities, private companies, and landowners. These benefits include:

Minimal environmental impact

- Using a recycled waste product to bio-remediate waste, our floating treatment wetlands have strong environmental credentials including:
- Satisfying stringent water quality consent requirements
- Eliminating the need for chemical dosing
- Eliminating the need for further high-impact 'concrete and steel' construction
- No energy used in the operation process; low energy in the manufacture process
- Zero-land use requirement
- Manufacture from recycled PET
- Using plants from eco-sourced seeds to harmonise with the natural vegetation

Flexible

Floating treatment wetlands are completely flexible and can:

- Fit any existing space or water body shape
- Operate effectively in all climate and environmental conditions
- Operate in fluctuating water levels
- Maximise retention times for treatment optimisation
- Concentrate on removal of particular pollutants through design adjustments

What this flexibility will mean for you is that, whatever your water treatment issue, the wetlands can be adapted to provide a benefit-loaded solution.

Beautification

Although the floating treatment wetlands are primarily a water treatment tool, they have the added bonus of being visually appealing as a floating wetland.

As a water-based feature in community facilities, they can enhance the natural environment and provide a habitat for land-based and marine wildlife. They also can be used as a landscaping feature on private residential projects.

Planting

The plant species suitable for floating wetlands are selected according to the reserve buoyancy required for the application. Generally, terrestrial species such as wetland sedges, rushes and grasses are the best option as they develop superior root structures within the water to provide for an increased surface area. However, many other planting types are also used.

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