PROTECTOR

SPECIALIST

STORMWATER

TREATMENT SOLUTIONS

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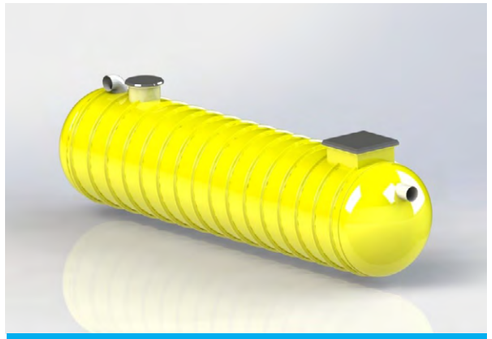

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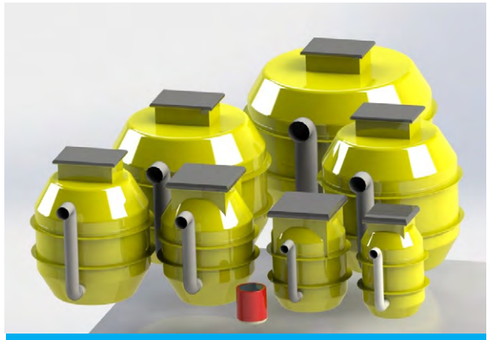

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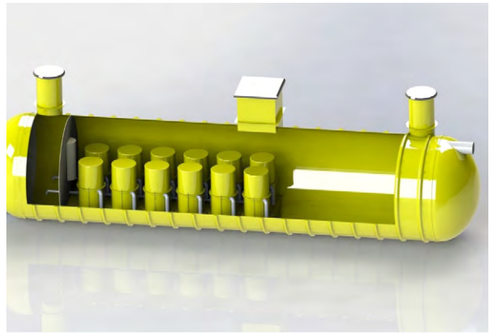

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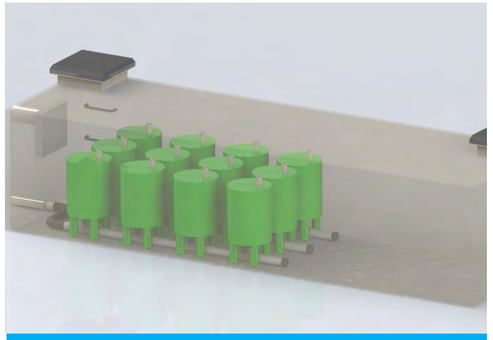

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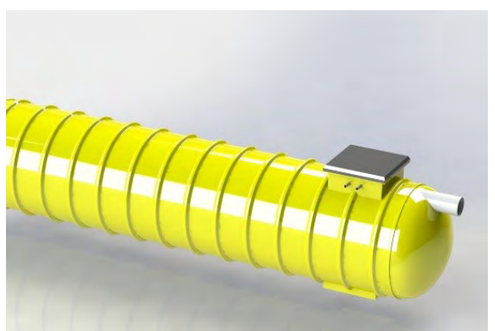

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WHY US

Protector, by ProtecFRP, is one the fastest growing stormwater treatment solutions provider in Australia. Dedicated to the environment, we are constantly striving to challenge the design and manufacture of stormwater treatment systems to improve our water quality and reduce water pollution throughout Australia. With many years of experience behind the helm of Protector and a dedicated team, we are here to provide every solution possible for every part of the treatment trains.

Protector's dynamic enterprise maintains its roots in the industry through dedicated service with over 18 years of experience and product knowledge. The basis for the company's operation, with continuous success, both yours and ours! Our products are renowned for their quality with painstaking attention to detail, and are designed, engineered and manufactured to the highest specifications, built to the Australian standards BS4994-1987 and ASME RPT1 and quality assured by third parties.

Our FRP designs strive to remove the highest possible percentages of all forms of water pollution using the most modern and respected techniques in doing so. Our commitment to improved water quality is essential to our mission at Protector, with the environments future being our number one priority.

Protector Products are manufactured for many applications and in a wide range of specifications to handle substances such as stormwater, runoff, oil heavy water, hydrocarbons, heavy and light sediment, heavy metals, nutrients, organic compounds and other gross pollutant runoff. With techniques such as adsorption, oil retention, filtration, sediment capture, hydrocarbon capture these systems will remove almost all contaminants from stormwater to be cleaned. The easily retrofitted stormwaters systems then can bring cleaner water back into the environment, protecting our world for a better future.

- **20 Years of Experience**
- **Wide Range of Products**
- **Quality Assured**
- **Long Life Products**
- **Innovative Designs**
- **Driven and Proud Team**
- **Committed to the Environment**
- **Fast and easy installation**
- **Minimal Landspace Consumption**
- **Long Life Products**

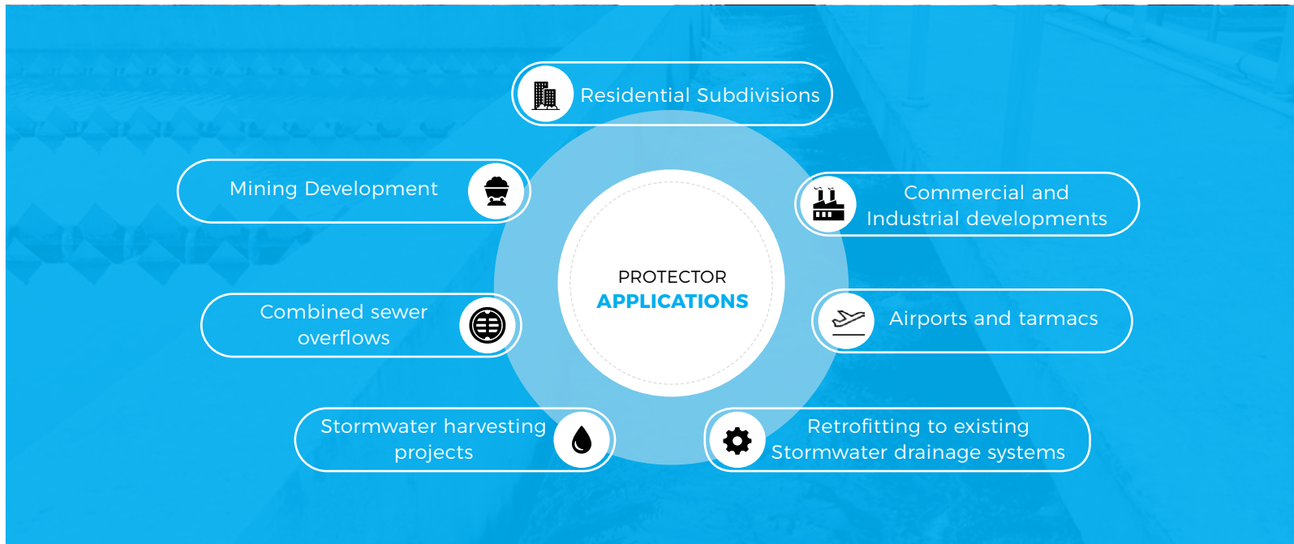
Protector is able to provide with solutions to every part of the treatment train with our innovative and efficient designs. Whether it be primary treatment systems in the form of gross pollutant traps, secondary treatment systems for removal of sediments, fine particles and attached pollutants, to tertiary treatment for removal of extremely fine particles, nutrients, organic compounds and heavy metals. We also provide solutions to all your retention needs in the treatment train, allowing for complete pollution removal in the treatment phase, to storage and retention systems in downstream phases.

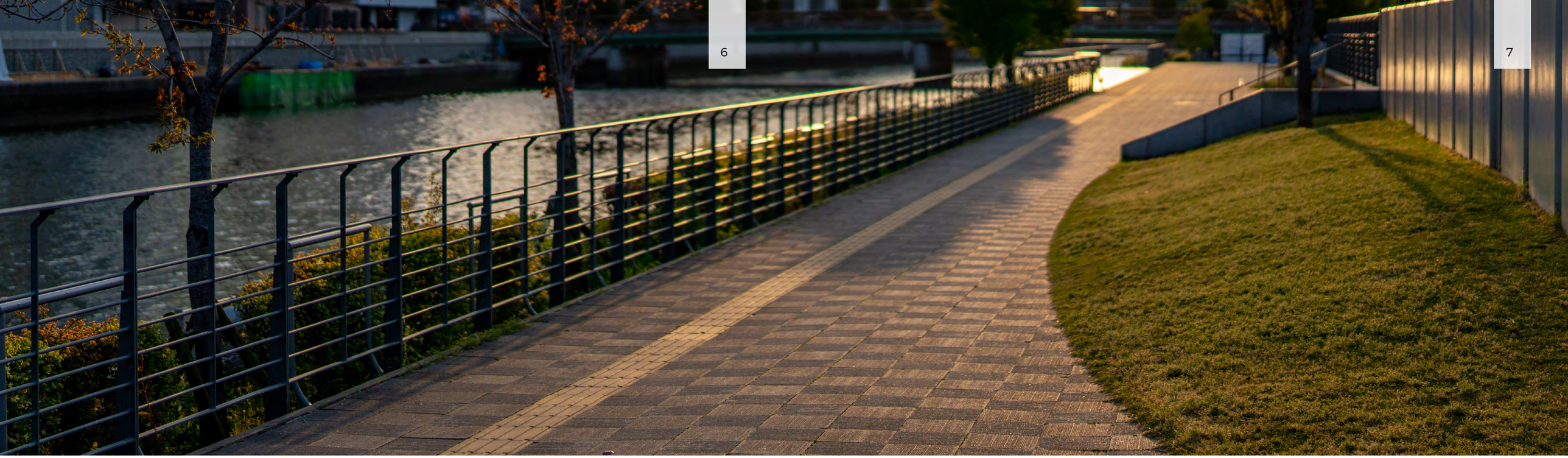
1. Primary Treament
Remove gross pollutants

2. Secondary Treament
Remove fine particles, sedimention & attached pollutants

3. Tertiary Treament
Removes very fine/colloidal nutrients & heavy metals

4. Retention Systems
Provide Storage and detention systems past the treatment phase.





THE NEED

Stormwater treatment systems form a vital part of increasing water quality and reducing pollution and contaminants that are being expelled into the environment. The role of stormwater treatment and management is an evolving issue, as developments, both commercial, industrial and residential, increase the strain of water pollution. With stormwater pollution making up the 2nd most influenctial contamination cause today, the need for effective and efficient solutions has never been greater. We, as a community of engineers and designers, are tasked to create new solutions that keep the water environment and ecology safe whilst also providing an economical solution to the increasing developments.

Storm water is water that is produced from rain, and possibly melting snow and ice, which flows over solid surfaces, capturing gross pollutants, sedimentation, nutrients, heavy metals and a wide range of other pollutants. The majority of this water infiltrates into the soil, or evaporated or run off and enter nearby waterways. In natural areas, free from construction, buildings, motorways and agriculture etc. the water just soaks and absorbs into the soil or evaporates. In developed areas, not only does the range and concentrations of pollutants grow and grow, but the areas in which the water is usuall absorbed or evaporated is removed, the storm water is funneled through stormwater drainage systems and directly into our rivers, streams and waterways. The natural processes of stormwater removal such as infiltration evaporation and filtering are greatly reduced, causing the concentrations and size of pollutants entering our waterways to drastically increase.
Stormwater treatment and management is about protecting our environment. When we develop stormwater treatment systems we are designing ways in which to protect our environment, and rid our environment and ecosystems of pollution and contamination. Hence the need for these systems is vital for our environment and ecosystems health and prolonged life. From gross pollutant traps which remove larger plastics, debris and sedimentation from our waterways, keeping our oceanic and water ecosystems protected from the well-known dangers of ocean and marine life coming into contact with plastics, to our tertiary treatments to remove heavy metals, organic nutrients and colloidal fine particles from our water systems and prevent from poisoning the environment. If the management of stormwater is conducted properly, with effective and efficient technologies in place, we can improve our water ecosystems and effectively lengthen our environments life.

Not only does proper stormwater treatment and management protect our environment, it also has several other benefits that are less widely known. These management systems can reduce flooding to protect people's lives and properties, reduce the demand on public stormwater drainage systems, support healthy streams and rivers, and create healthier, more sustainable and viable communities. Effective stormwater management provides not only vital environmental benefits, it also provides social, economic and communal benefits.

Exterior Pressures

There is also an increase in pressure from environmental authorities EPA in terms of designing systems that meet their standards. The Environment Agency has published Pollution Prevention Guidelines 'Use and Design of Oil Separators in Surface Water Drainage Systems: PPG3'. These set out the standards with which separators must comply and assist in deciding on the need for a separator at a site and the size and type that is appropriate. These Pollution Prevention Guidelines PPG3 require separators to be tested in accordance with the standard test procedure based on the European Standard BSEN858-1:2002. Along with these guidelines that are set out, there are NPDES Phase II permits that require the installation of storm sewer systems in communities that serve less that 100000 people, hence increasing the need and frequency of stormwater treatment systems. We at PROTECTOR feel we have come up with several highly advanced and unique solutions to the problems that stormwater pollution present whilst also serving to abide by the laws and regulations set out by the EPA.

Our environments Protection Is Vital

We live in the driest inhabited continent, and hence managing our waterways will require a complete water management system to ensure out countries ecology and water environment is protected. As we continue to grow as a society, the need for successful and efficient stormwater treatment will continue to grow. Developments that conserve, enhance and utilises the communities resources so that ecological processes are maintained and he total quality of life for the future is preserved. Our systems are the first step to achieve this solution Hence we must continue to implement these unique treatment solutions that have been developed by PROTECTOR to ensure that the water quality remains acceptable.
It's important in society to maintain a clear image of the bigger picture. As our society continues to grow in population and city size, we increase the area covered by impervious and non –absorbent surfaces that do not allow infiltration and absorption and in turn increase the amount of polluted runoff. We must continue to implement these stormwater treatment technologies not for just the current benefit, but also for the future and more vital benefits.

COMMON QUESTIONS

Q: Why do we treat stormwater?

Storm water is water that is produced from rain, and possibly melting snow and ice, which flows over solid surfaces, capturing gross pollutants, sedimentation, nutrients, heavy metals and a wide range of other pollutants. The majority of this water infiltrates into the soil, or evaporated or run off and enter nearby waterways. In natural areas, free from construction, buildings, motorways and agriculture etc. the water just soaks and absorbs into the soil or evaporates. In developed areas, not only does the range and concentrations of pollutants grow and grow, but the areas in which the water is usuall absorbed or evaporated is removed, the storm water is funneled through stormwater drainage systems and directly into our rivers, streams and waterways. The natural processes of stormwater removal such as infiltration evaporation and filtering are greatly reduced, causing the concentrations and size of pollutants entering our waterways to drastically increase.

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Q: What process is best for removing hydrocarbons from Stormwater?

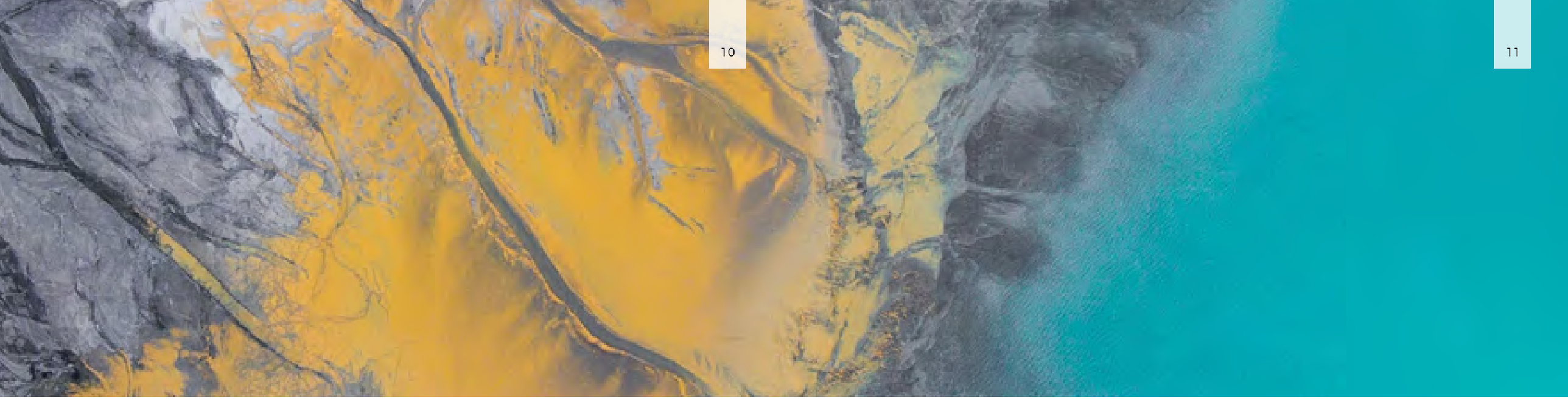
Hydrocarbons make up a large majority of the pollutants present in water, being produced from fueling stations, cars and motor vehicles and in industrial processes. If these hydrocarbons flow into the stormwater systems through surface runoff they must be treated efficiently and completely. Large proportions of hydrocarbons and oils in water ways is extremely harmful to the ecosystem life that exists in the water systems that follow our stormwater treatment. There are several efficient processes of hydrocarbon removal:

Gravity Separation - This principle works off a simple theorem, Stokes Law. This defines that the buoyant velocity rise of a droplet is greatest when the density of the droplet, in this case oil, is greater than the density of the continuous phase, the water. This hence means that oil particles and hydrocarbons will always rise to the surface of water. Hence this process can be used to separate the hydrocarbons from water in a non-turbulent flow, such as in a storage or retention system.

Coalescence – In water treatment, the energy that is input into water is very low, causing the process of coalescence to occur in what small oil droplets collide and form bigger droplets, and due to the low energy these particles do not disperse. This process allows for the particles to be removed more simply.

Adsorption - This process is the adhesion of atoms, ions or molecules (such as hydrocarbons) to a surface. This is a surface phenomenon in which the hydrocarbons will attach themselves to the surface of another system (such as the filter systems) and hence be removed from the flow of water.

In reality a combination of these processes is the best process for the removal of hydrocarbons from stormwater. Systems that encapsulate these are the greatest for hydrocarbon removal and management.



When considering what are the best processes for treating stormwater runoff in a certain application, it is vital to consider the various forms of contaminants that are produced in these areas, as well as the environment in which the application is to be placed in. Carparks developments, have the tendency for high levels of oils, gross pollutants from high foot traffic, hydrocarbons and heavy metals produced from cars ad rooftops. These areas need to be thoroughly treated for discharge back into the environment, as usually is the requirement for water treatment in these areas. Hence the tertiary treatment systems are required for these areas, with all of the protector tertiary designed systems removing the required contaminants that are produced from these areas.

The processes best used for carparks as their applications include:

- Gross Pollutant traps
- Gravity separation
- Coalescence
- Adsorptions
- Attachment and interception
- Sedimentation
- Precipitation

Q: Why do we treat stormwater?

There isn't one single process that best removes a certain contaminant. To best tackle the removal of pollutants, a wide range of techniques need to be used in conjunction with each other to ensure the most effective removal possible. High traffic areas have a series of pollutants that remain a big issue in treatment of these systems. High traffic areas produce contaminants such as high amounts of hydrocarbons, high levels of gross pollutants, heavy metals and fine sedimentation. Hence solutions are required to remove these pollutants are produce water for the environment with as low percentages as possible. Hence a combination of primary, secondary and tertiary, and depending on the weather conditions and flow rates of the area, retention systems.

The processes which we recommend to be utilised in the removal of pollutants produced from highways include:

- Gross Pollutant traps
- Gravity separation
- Coalescence
- Adsorptions
- Attachment and interception
- Sedimentation

Q: What is the difference between physical filtration and biodegradation?

The process of physical filtration is the mechanical and physical removal of solids or fluids from a fluid through forcing the flow of the filtered liquid through a medium. This process is most simply described by the use of a medium having perforations smaller than the size of the particles in which are being endeavored to be removed. Biodegradation is the disintegration of materials through bacteria, fungi or other biological means. Essentially the process of biodegradation is in which material is consumed by microorganisms.

This process can be implemented effectively in stormwater treatment, in conjunction with soil. Due to soils high absorbance, water is absorbed into the soil media in which these bacteria and microorganisms live, and the contaminants are slowed in the soil and are hence consumed by the organisms living in the soil. The water flows out of the soil with contaminants removed. These microorganisms in fact use this process to increase their population and remove the contaminants more efficiently. The matter which is able to be consumed by these microorganisms are generally organic materials such as hydrocarbons and nutrients.

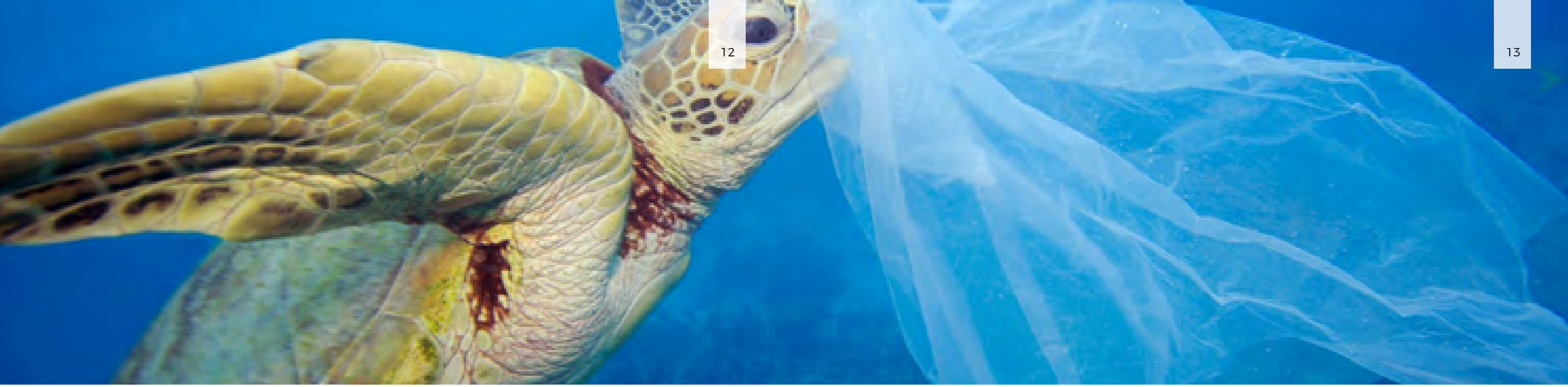
Q: What makes a good stormwater treatment system?

Several things are vital in the construction of an effective and efficient stormwater treatment system. Firstly, the system needs to encapsulate all process required for the site in which the runoff is being produced. This means careful considerations of the surrounding environment and its specifications which include:

- Physical Locale
- Rainfall conditions
- Surrounding environment, be it man made or natural
- Catchment size
- Contaminant types
- Flow rate
- Risk analysis.

Once these considerations are reviewed, we can effectively determine which processes need to be used to remove the contaminants that shall be produced. From this it can be decided which systems must be installed, whether it be a single or a complex treatment train. It must be also ensured that no unnecessary systems are implemented which will provide no significant assistance to the stormwater treatment process. If all of the contaminants that can be present are considered, the correct processes can be implemented to ensure effective removal before the water is returned to our waterways and ecosystems.

It is vital that only proven well tested processes are used in the treatment proesses. This means that the process in which are being implemented must all be proven and ensured to be THE MOST effective and efficient in our processes. This is why there is constant need for redevelopment and research into the stormwater treatment technologies so that we are constantly improving the processes in which we currently use.



WHY STORMWATER TREATMENT MATTERS

OCEANIC ECOSYSTEMS

Our ocean and water ecosystems are fragile. They need to be protected. More and more oceanic wildlife is suffering from the pollution and contamination of their home, the streams, rivers, lakes and oceans that cover the earth. 80% of the pollution in these water ecosystems comes from the land and one of the bigger attributions of this is from stormwater runoff and the pollution it causes. Our marine life is in peril from the high amounts of gross pollutants – be it plastic bottles, cigarette waste, rubbish and plastic trash – that are flooded into their waterways as well as from toxic contaminants such as hydrocarbons, heavy metals, phosphorus and much more. With more than 8 million tonnes of plastic being poured into the oceans each year, the need for improved stormwater treatment management is at an all-time high. We need to protect these ecosystems.

Our stormwater treatment technologies are tackling these issues head on, with modern techniques and technologies being implemented by our team of engineers to develop the perfect solution to this problem. Our treatment systems are designed to remove all forms of contaminants that are being flooded into our oceans and waterways, using processes such as adsorption, sedimentation, biodegradation, physical

filtration process and many more. Our Gross pollutant traps are design to remove all forms of plastic debris from the water runoff. The gross pollutant traps that we have developed act as the first line of defence for our marine wildlife, protecting them from choking hazards, from being entangled and dying in their homes. Our secondary filtration systems reduce the oil contamination to as little as 5mg/L and our tertiary treatment systems remove a high percentage of heavy metals, phosphorus, nutrients and bacteria and much more to keep our waters safe.
We need to allow our oceanic wildlife and ecosystems to recover from the damage that has already been done, and from the damage that may come in the future. If we implement these stormwater systems around Australia it will be the first step in protecting our water systems and keeping them safe. Our ocean and water ecosystems are fragile. They need to be protected

THE BEAUTY IN NATURE

There is beauty everywhere in this world, but we are at risk of losing it all. The wildlife that surrounds us is disappearing gradually but surely and this is due to the expanding developments of our cities and the pollution it produces. Removing the pollution from our waterways using stormwater treatment systems and management processes is vital in keeping our growing cities to be beautiful and natural. Efficient stormwater treatment leads to less strain on our developing cities, whilst also helping to sustain our streams and rivers that traverse our cities. The combination of these two additional benefits of effective stormwater management leads to a more beautiful development. Effective stormwater treatment also reduces the possibility of flooding and breaching of waterways, and this ensures the safety and the constant beauty of the world we live in.

With a constantly growing population and growing cities, we need to keep in touch with the beauty in nature. Effective stormwater management ensures this. Having clean, healthy and sustained water systems and rivers and streams helps the growth of wildlife population as well as healthy growth of flora. The beauty in nature needs to be promoted, not hindered.

With increased wildlife populations and increased flora growth, we will begin to see a more beautiful society. Australia has the worst extinction rate in the world, losing many species rapidly, with 14 disappearing completely over the last 50 years. With human population growth and the incumbent cities growth, Australia's unique wildlife populations have been reducing steadily. With the improved nature and promotion of water quality and its surrounding health, these populations may begin to grow again and we may see the increase in our Australian fauna's population to what it once was.

We need to continually keep our environment healthy and in turn this will keep our society healthy and happy, and improve our quality of life. Stormwater management and treatment is just a small but vital addition to our developing cities and society to keep it a beautiful and nature filled place.

MAKING OUR WORLD A CLEANER PLACE

Is there anything more important than keeping our world a healthy, cleaner, environmentally friendly place? Keeping our environment clean is vital for a wide range of reasons, all of them in service of keeping our environment protected and promoting its growth, not its demise. With our growing population, we produce over 2 tonnes of waste per person, with it resulting in over 50 million tonnes per year in Australia. This waste finds its way into our environments through a array of processes, be it littering, trash disposal and landfill, dumping of waste and stormwater runoff. With surface water forcing contaminants and pollutants into our stormwater systems and waterways, we are adding pointless amounts of pollution into our environment, endangering our flora and fauna without reason. These pollution sources can easily be prevent with the implementation of effective technologies.

There currently exists an island in the pacific, a trash island, that is now perceived to be 3 times the size of France, and continually growing. There are cases of this scale of pollution all over the world, with ecosystems perishing and trash pollution our world. We need to take whatever steps we can to reduce this and stop the pollution of our world. The stormwater solutions that we have designed effectively reduce all forms of water pollution coming from our cities and preventing them from being sent into our environment. The capture, decontamination and cleaning of the stormwater sends safe water back into our environment, and this water can promote the growth of wildlife and flora.

OVERVIEW OF PRODUCTS

EcoProtector

Hydrodynamic, fill capture, high capacity gross pollutant Trap

StormProtector

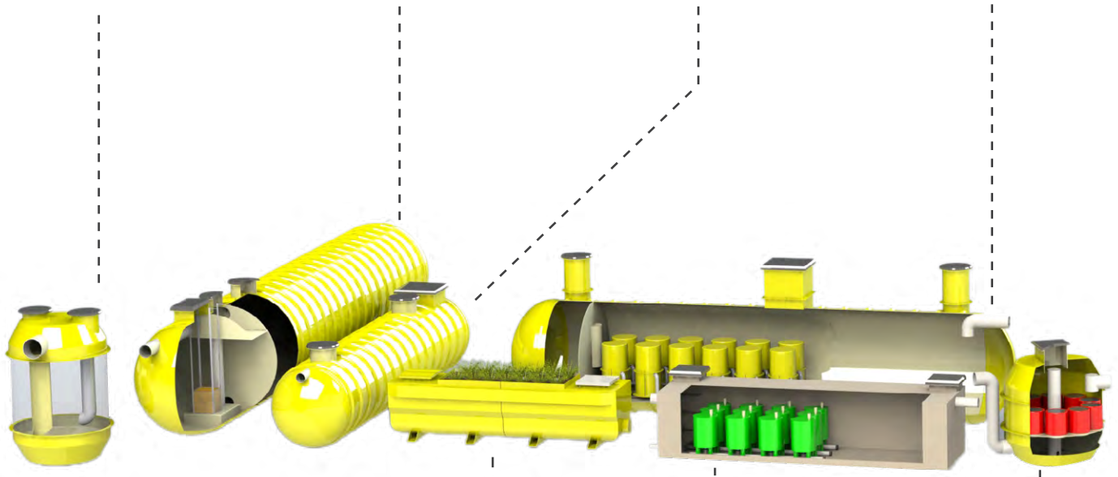
Dual chamber, fine particle, sedimentation and organic pollutant removal treatment with large retention and Bypass.

HYDRAPROTECTOR

Highly efficient, full retention separator to treat first flush, fine particulates, nutrients, heavy metals and hydrocarbon filtration system.

MaxiProtector

Dual chamber, fine particle, sedimentation and organic pollutant removal treatment with large retention and Bypass.



BIOPROTECTOR

Hydrodynamic, fill capture, high capacity gross pollutant Trap

XTREAMPROTECTOR

Upflow filtration process designed to remove fine sediments, nutrients, heavy metals, phosphorus and hydrocarbons using our exclusive filter stack design.

EnviroProtector

Specialist stormwater filter for heavily polluted areas able to removing heavy metals, TSS, nutrients, hydrocarbons, designed to your requirements.

The following treatment systems that PROTECTOR offer are suited to a wide range of sites and applications, ranging from parks and recreational areas, to residential systems, to airport tarmacs and to industrial sites.

DESIGN CONSIDERATIONS

Important considerations must be taken when deciding on which Protector product is suitable for your needs. With the assistance of our team of experienced staff we can offer endless assistance and advice in this matter. The most important aspects we consider to help solve your needs are:

Physical Local and Rainfall Conditions Catchment Size Contaminant Types Flow Rate Risk Analysis

When all of these systems are considered our team at PROTECTOR will determine the best solution for you site demands.

APPLICATION	ECO	STORM	HYDRA	ENVIRO	MAXI	BIO	XTREAM	STORMBRAKE	RETENTION BASINS
Shopping precincts	✓	✓		✓	✓		✓		
Commerical Zones	✓	✓		✓	✓	✓	✓	✓	✓
Recreational Areas	✓								
Light Industrial Areas	✓	✓		✓				✓	✓
Beaches and Parks	✓							✓	
Power Stations	✓	✓	✓	✓	✓	✓		✓	✓
Mining Areas	✓	✓	✓	✓				✓	✓
Service Stations	✓	✓	✓					✓	✓
Re-fuelling Areas	✓	✓	✓				✓	✓	✓
Car Parks	✓	✓		✓	✓	✓	✓	✓	✓
Depots	✓	✓		✓	✓	✓	✓	✓	✓
Heavy Industrial Areas		✓		✓	✓	✓	✓	✓	✓
Tunnels		✓		✓	✓		✓	✓	✓
Highways and Intersections		✓		✓	✓		✓	✓	✓
Airports and Tarmacs		✓		✓	✓		✓	✓	✓
High Heavy Metal Run offs		✓		✓	✓	✓		✓	✓
Vehicle Maintenance Areas		✓	✓	✓	✓	✓	✓	✓	✓

Overview

The EcoProtector is a hydrodynamic, full capture, high-capacity trash and debris removal GPT (Gross Pollutant Trap) with superior litter and organic debris capture. The EcoProtector has been designed to remove particles greater than 5mm using physical processes tot trap solid waste such as litter and coarse sediment under low velocity conditions.

The Process

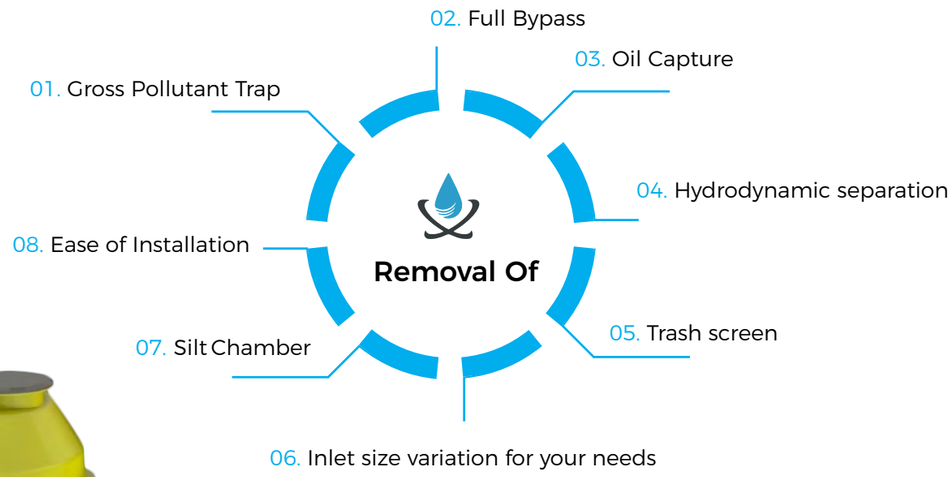
The water enters the ECOprotector, where the pollutants collide with a trash screen, deflecting all sediments and Gross pollutants into the vortex chamber and down the vortex tube. These two components cause a cyclonic motion of the water, separating the pollutants from the water. Oil capture is also provided in this chamber as the water settles to the bottom. The water then rises out of the system and out of the GPT, with pollutants removed. The remaining pollutants are then removed through maintenance procedures.

Product Structure

1. Inlet
2. Outlet
3. Covers: Available in Standard or Customised designs
4. Screen
5. Trash Holding Area
6. Oil Holding
7. Inlet Vortex Tube
8. Outlet Riser
9. Silt Holding Chamber

ECO PROTECTOR

Features



Installation and maintenance

Step 1 : Excavate hole

Step 2 : Place station in hole

Step 3 : Fill well with water about 20% of total volume

Step 4 : Back fill to locking ring

Step 5 : Pour ballast

Step 6 : Install all connections as per manual*

Step 7 : Back fill and pour top slab and install access cover

Typical Model Flow Rates and Sizes

MODEL	MAX FULL TREATMENT FLOW	MAX TOTAL FLOW (WITH BY PASS)	DIAMETER	DEPTH	CONNECTION SIZES
ECP.1200	18 LPS	180 LPS	1200mm	2200mm	100mm - 225mm
ECP.1500	24 LPS	240 LPS	1500mm	2500mm	100mm - 375mm
ECP.1850	60 LPS	600 LPS	1850mm	3000mm	225mm - 600mm
ECP.2200	140 LPS	1400 LPS	2200mm	3200mm	375mm - 900mm
ECP.2500	200 LPS	2000 LPS	2500mm	4500mm	600mm - 1350mm

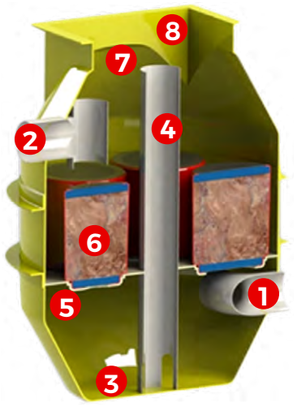
Overview

The Protector EnviroProtector is a specialist stormwater filter for heavily polluted traffic areas, designed for installation within new or existing chambers, The Fiberglass housing is safe and easy to fit on site. The EnviroProtector operates in an up-flow process resulting in minimal head drop between the inlet and the outlet. The stormwater is treated within the unit by the following processes: sedimentation, filtration, adsorption and precipitation. It is suitable for Heavy Metal, TSS and Nutrient reduction

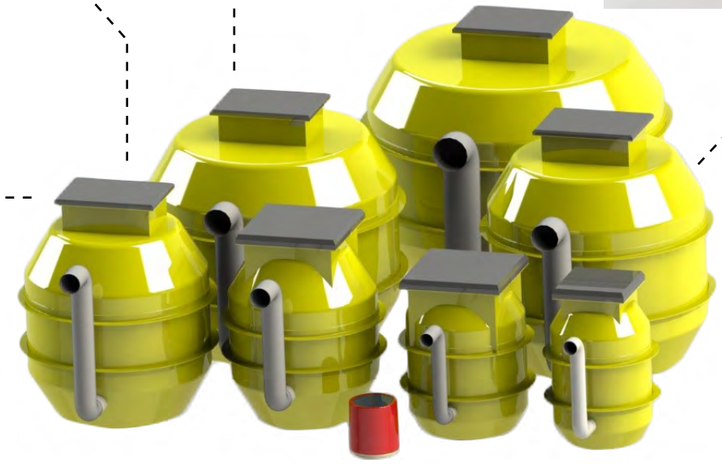
The Process

1. Rainwater from the connected area is funnelled into basal section of the EnviroProtector
2. Hydrodynamic separator creates a radial flow pattern, separating the sedimentation
3. The water follows the up flow process into the filters were particulates and contaminants are removed
4. The water fills the top section, and the oil that escapes the filters is raised above the Tee outlet into the oil capture, and water is discharged

Product Structure

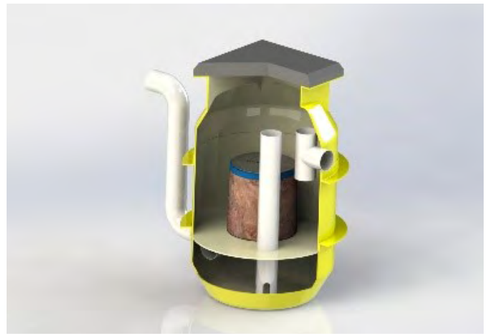


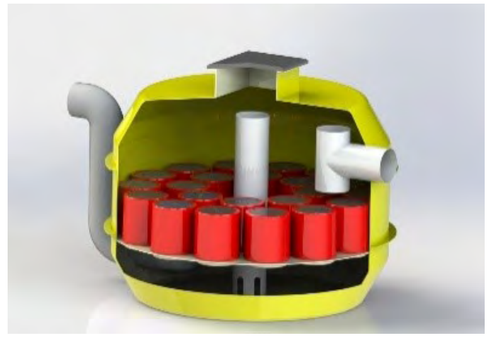
1. Stormwater Inlet
2. Outlet to water storage, water systems or surface waters
3. Silt Trap
4. Overflow pipe
5. Filter floor restrained to EnviroProtector body
6. Filter element
7. Oil Trap
8. Access Manway and Manway cover



ENVIRO PROTECTOR

Wide range of sizes and filter arrangements, from 1 filter to 23!





Installation and maintenance

System comes preassembled and allows for rapid and simple install

Step 1: Excavate hole

Step 2: Place station in hole

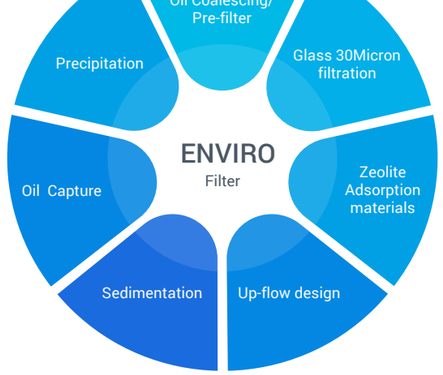
Step 3: Fill well with water about 20% of total volume

Step 4: Back fill to locking ring

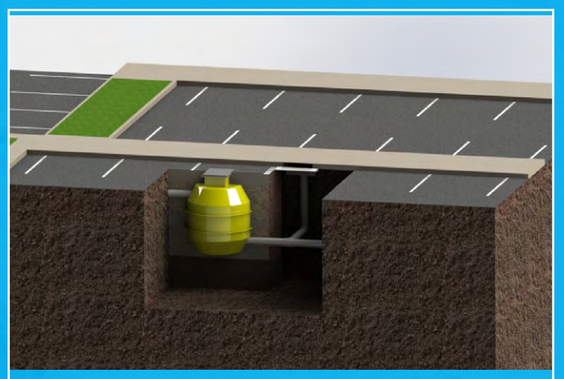
Step 5: Pour ballast

Step 6: Install all connections as per manual*

Step 7: Back fill and pour top slab and install access cover



Roof Type

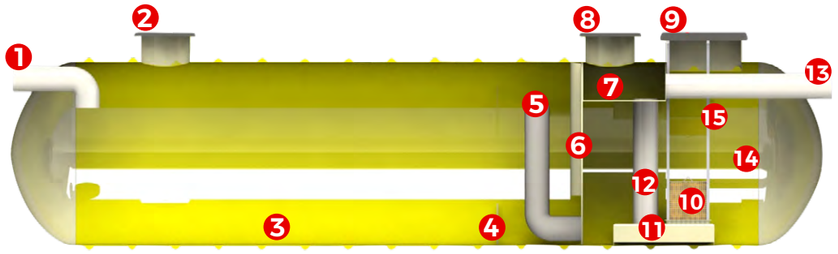


Traffic Type

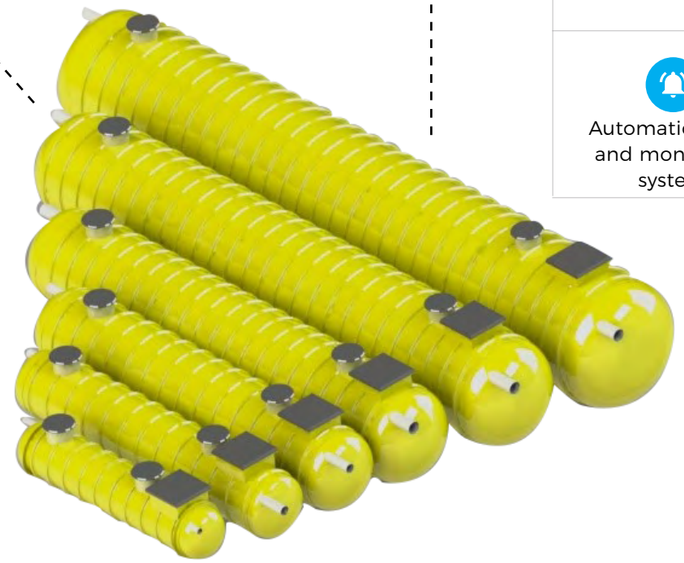
Overview

The STORMPROTECTOR by PROTECTOR is a dual chamber stormwater treatment system full equipped with internal bypass and Coalesce filtration system. The system has a large retention and settle chamber to provide a smooth flow for the secondary chamber system to allow complete secondary filtration of fine particulates, sedimentation and attached particles to the needs required of your site.

Product Structure



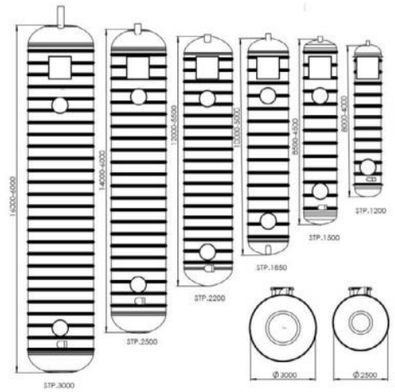
1. Flame Dip Inlet
2. Silt Chamber Manway
3. Silt Chamber
4. Silt Baffle
5. Secondary Chamber Dropper
6. Bypass Riser Tube and secondary chamber Baffle
7. Bypass box
8. Bypass Manway
9. Secondary Chamber and Filter Removal Manway
10. Coalescing Filter
11. Flow Director
12. Exit Riser Tube
13. Discharge Pipe
14. Secondary Chamber and Oil Trap
15. Filter Guide Rail System



STORM PROTECTOR

Features of Stormwater

Coalesce Filtration	Settlement chamber	Bypass	Coalesce Filter Guiderails
Flame Dip Inlet	Gravity operated	Ease of Maintenance	Underground Installation
Automatic alarm and monitoring system	Automatic closure	Offline Bypass	Passive Hydraulic system



A Huge benefit of the STORMPROTECTOR design is the wide Configuration Range - The STORMPROTECTOR has a wide range of sizes, inlet sizes, flow rates and possible filtration rates to suit any demand of any site.

Installation

Step 1: Excavate the area.

Step 2: Lifting and handling of the system must use appropriate processes. More details can be found in the Manual.

Step 3: Place the Concrete Base Slab

Step 4: The system can be secured in several ways including Pea gravel and concrete surrounds, stabilised sand surroundings, concrete base and concrete surround, pea gravel backfill, mechanical anchoring.

Step 5: Connect each suitably designed fitting with the desired location for completion.

Step 6: Install Concrete Apron if required

Overview

The HydraProtector a full retention, coalesce filtration separator where it is acceptable to treat the first flush and normal flows up to 6.5mm/hr rainfall. This covers approximately 90% of all rainfall events in Australia. Any excess rainfall is by-passed without treatment

The Process

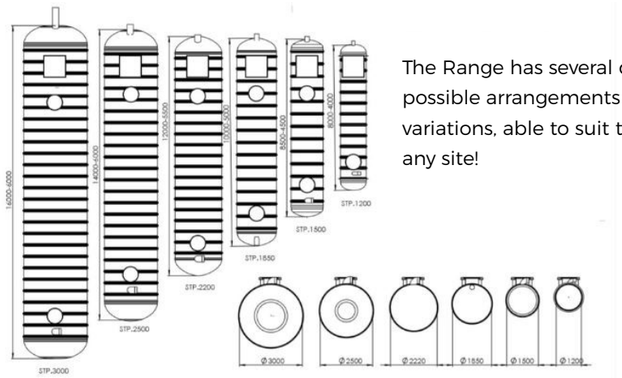
1. The liquid passes in through the inlet dip pipe

2. The rainwater from the connected area is fed into the silt chamber. This section of the tank is designed to cause the sedimentation to settle to the bottom of the silt chamber as the water rises.

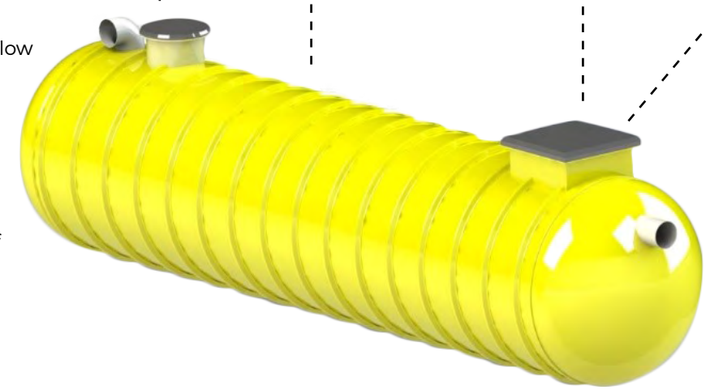
3. As the water level rises the water reaches an appropriate height to flow into the next section of the HYDRAPROTECTOR, past the automatic closure device in and into the baffle. The Inlet pipe from the into the baffle has the design to prevent the flow of oils into the coalesce unit.

4. The water then flows through the baffle into the coalesce unit and filtration of hydrocarbons occurse to 5mg/L or less.

5. The cleaned water then passes through the flow director, up into the outlet flow pipe and out into the water systems



The Range has several different possible arrangements and diameter variations, able to suit the demands of any site!



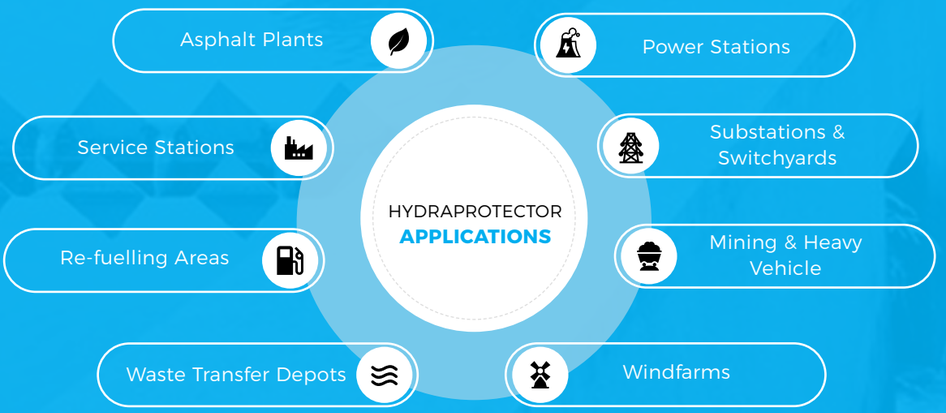
HYDRA PROTECTOR

FEATURES OF HYDRAPROTECTOR

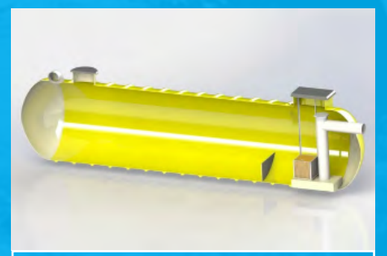
Gravity operated	Option of single, dual or triple chamber systems	Coalesce Guiderail systems
Ease of Maintenance	Automatic Alarm/ monitoring system	Underground Installation
Full Retention and all liquid is treated with no bypass	Coalesce stormwater treatment filter for separation of smaller droplets of contaminants	Automatic closure device to prevent contaminants from discharging into waterways

Installation and maintenance

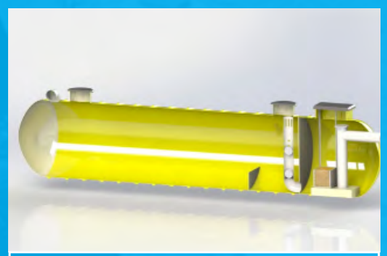
1. Flame Dip Inlet
2. Silt Chamber inspection manway
3. Silt Baffle
4. Secondary Chamber Dropper Pipe
5. Automatic closure device
6. Secondary chamber baffle
7. Coalescing filter
8. Flow Director
9. Discharge riser
10. Discharge Outlet
11. Filter Guiderail removal system
12. Secondary Chamber manway and Filter removal access



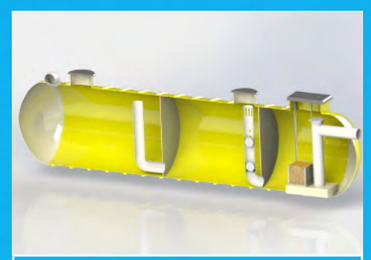
Configurations



Single Chamber



Dual Chamber



Triple Chamber

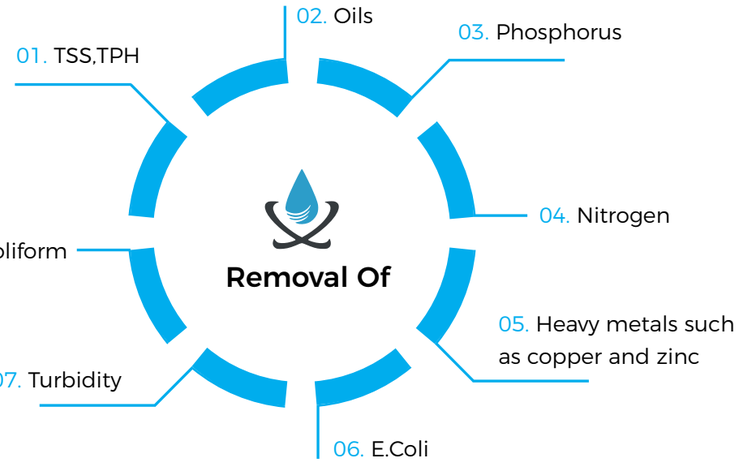
Overview

The Bio Protector is a combination of two effective treatment processes, being physical Filtration process and a biological filtration process. This system is engineered to combine these two processes to form a complete and effective process to remove a large range of contaminants

The Process

The stormwater enters the Storm protector system, where the water initially flows through Protector Filter in an initial capture chamber. The water builds up around the filtration, and using the processes of adsorption and retention, the first stage of the system removes sediment, gross pollutants and larger contaminants. The water then flows into our bioretention media where it removes pollutants, bacteria and other contaminates. The water flows into the perforated outlet tubes and into the discharge chamber.

BIO PROTECTOR



Features

VALUE

With the most competitive prices with the highest quality, we offer the most cost-effective system for a long lasting and effective product.

APPLICATION

Can be used in a wide range of configurations being commercial, residential, urban or industrial.

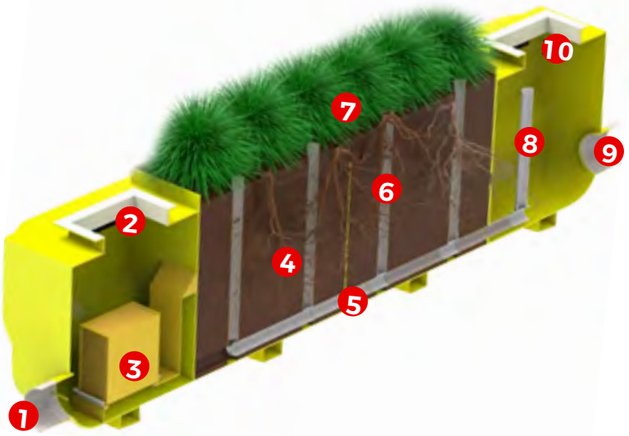
VERSATILE FOR ALL AREAS

Our Product is ideal for both retrofitting into already existing urban settings or easily installed into new construction sites.

EASE OF INSTALLATION AND MAINTENANCE

The dual process of the Bioretention and the filtration media ensure FRP designs will strive to keep our streams, waterways and our environment clean.

Installation and maintenance



1. Inlet
2. Coalesce Chamber Manway
3. Coalesce Filter and Flow director
4. Bioretention Media
5. Water flow pipe
6. Water Bioretention inlet pipe
7. Plant System
8. Bioretention outflow chamber
9. Outlet Discharge
10. Outlet Chamber Manway

FILTRATION TECHNIQUES

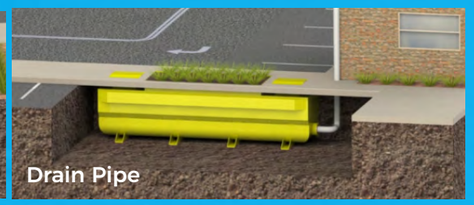
The dual process of the Bioretention and the filtration media ensure FRP designs will strive to keep our streams, waterways and our environment clean.

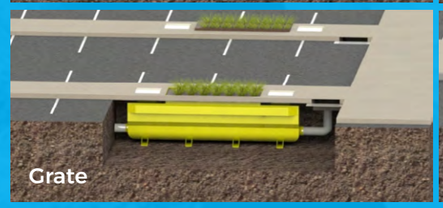
HIGH FLOW BYPASS

Allows for continual flow of water through the system in high flow conditions.

AESTHETICALLY SUITABLE

Our design can easily improve and camouflage into any urban setting, whilst still fulfilling its requirements as a filtration system. The organic look that is provided by the bio protector allows an aesthetical ease into any environment.

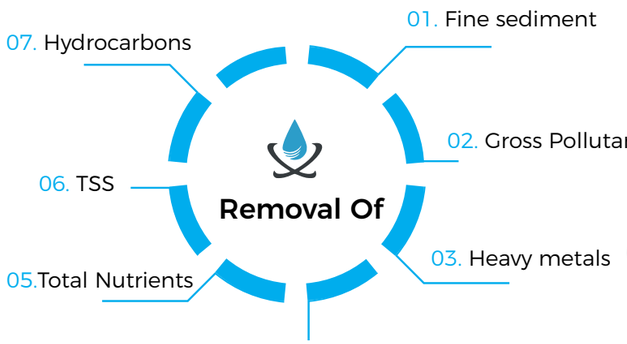


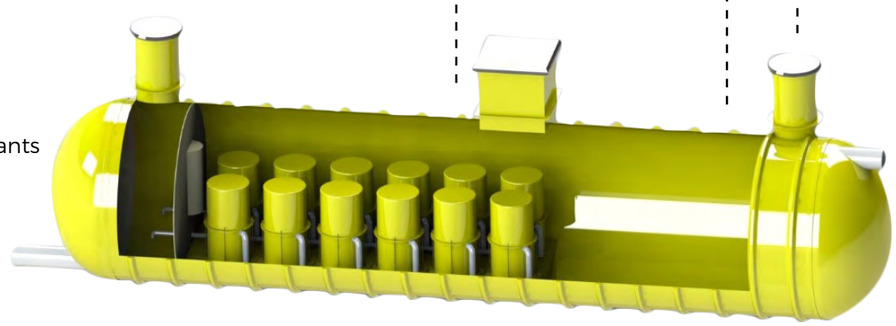


Overview

The MaxiProtector uses the most efficient filtration techniques in a compacted layered design to provide the best stormwater treatment available. The system uses the hydraulic flow of stormwater to move the contaminated water into our MAXIPROTECTOR system. The system is designed as a passively hydraulic gravitational flow system that is able to operate in any forms of flow in any flow rate conditions. With the triple layered filter media the MAXIPROTECTOR is able to filter out a high percentage of contaminants that are present in stormwater runoff.

The filtration process follows a unidirection flow pattern. The water enters and risess through the inlet pipe where the water flows onto the top layer of the triple filtration media layered system. The water filters through each layer through gravitational flow, removing specified contaminants, and through the filter nozzles. The water then rises into the retention chamber, and once this chamber reaches capacity the water flows out of the discharge channel, creating a siphon, allowing the water to continually flow, even when the water level drops below the filter.



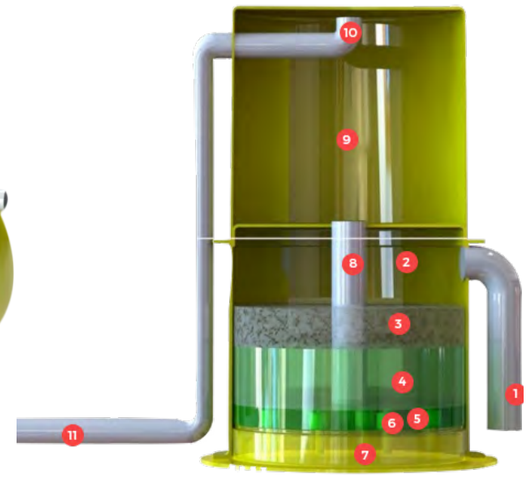


MAXI PROTECTOR

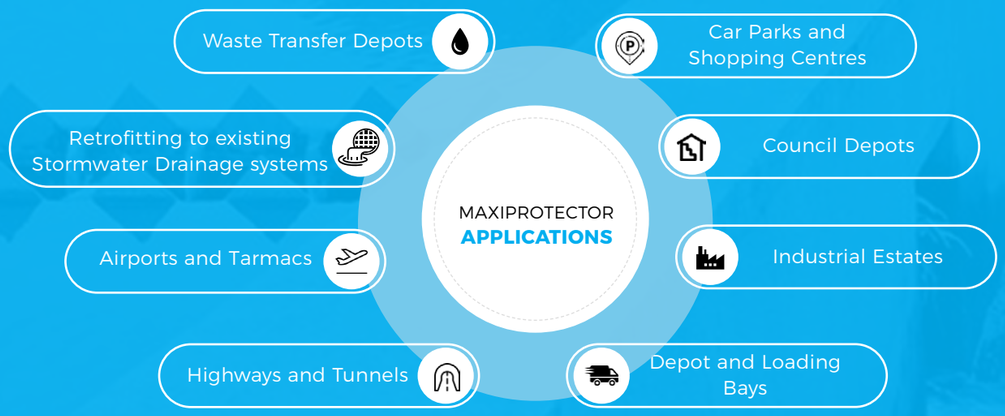
Features

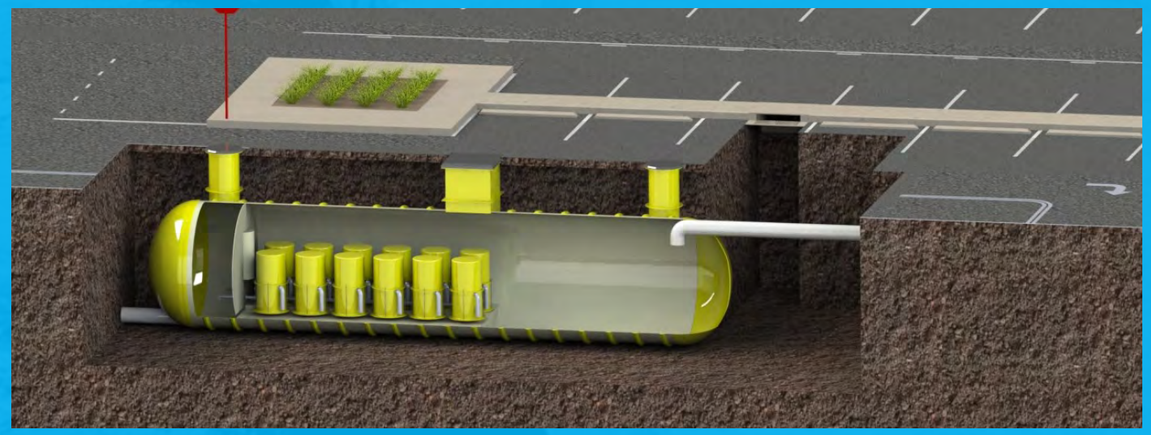
Retention hamber	Retrofitting installation	Underground installation	Triple Layer filtration Media
Backwash	High flow Bypass	Vary Configurations	Simple Maintenance

Installation and maintenance



1. 1 Inlet riser
2. Initial containment chamber
3. Zeolite Filtration media layer
4. AFM Filter media Grade 1
5. AFM Filter media Grade 2
6. Filter Nozzle arrangement and filter floor
7. Secondary post filtration chamber
8. Filtered water riser
9. Retention chamber
10. Outlet Dishcrage
11. Piping outflow system





Overview

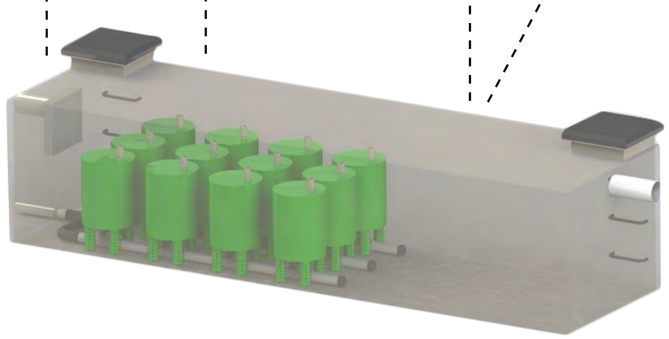
The XTREAMPROTECTOR is designed to filter stormwater runoff and remove a large proportion of the contaminants in the process. Our unique filter design consists of three rings of specially designed and tested filter medias, all designed to remove particular contaminants at each stage of the flow. This filtration system is able to form a siphon during the flow to allow constant flow of water through the filter system even at points of low water levels. The filtration device to be implemented into stormwater systems to reove fine sediments, nutrients, heavy metals, phosphorus and hydrocarbons from the stormwater surface runoff.

The Process

1. Water enters through our specially designed inlet legs
2. What fills the area below the filter rings, proceeding to flow up the outer area of the filter rings
3. The water is forced through the filter rings, through our 3 specially designed filter medias between the two steel metal plates, removing the require contaminants.
4. The water flows into the central riser chamber and flows into the retention chamber
5. Water flows into the central dropper and into the flow directing pipes, leaving the system.

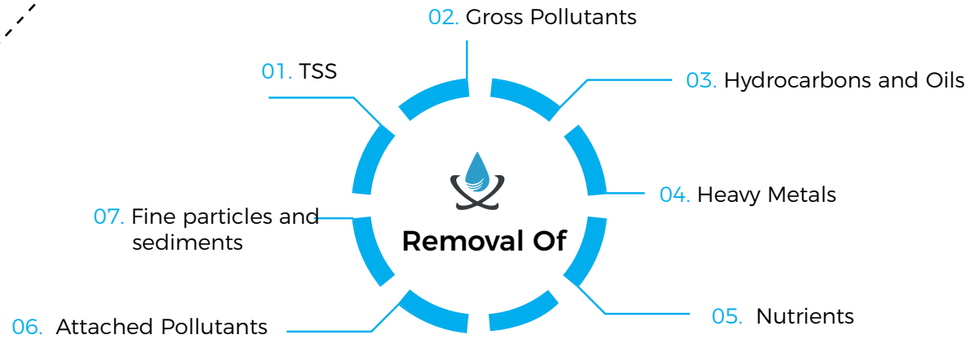
Product Structure

Adsorption	Sedimentation	Filtration	Interception and Attachment
Up-Flow Process	Backwash Cleaning	Bypass System for high Flow Conditions	One-Way Air Release Valve

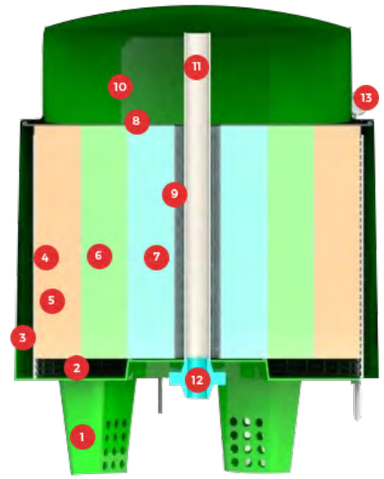


XTREAM PROTECTOR

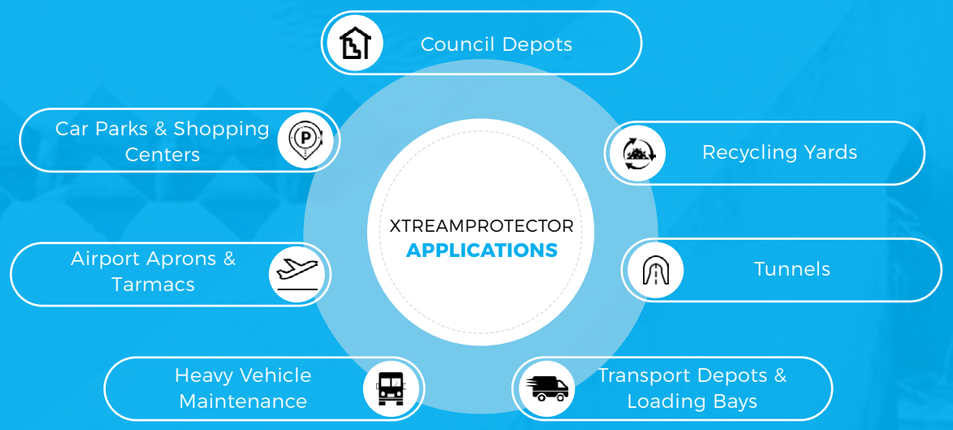
Features



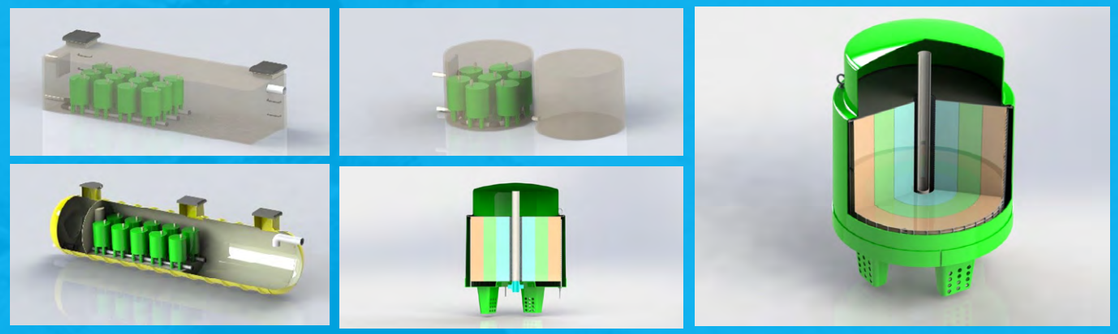
Product Structure



1. Inlet legs
2. Lower water channel
3. Outer riser channel
4. 2mm exterior wire mesh
5. Filter media 1 - Zeolite
6. Filter media 2 – Activated Carbon with 1mm wire mesh
7. Filter Media 3 – Ausperl Perlite with 1 mm wire
8. Steel Disk Plates
9. Inner riser channel with 1.6mm wire mesh
10. Retention chamber
11. Dropper Outlet Tube
12. Outlet Point into Piping arrangement
13. I hooks to hold filter FRP shell



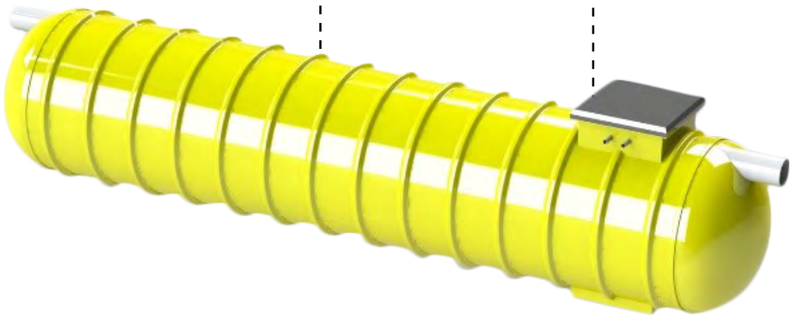
INSTALLATION CONFIGURATIONS



Overview

Our Retention systems are designed for use in storage, detention and retention at the end of our treatment trains. At the final point of our systems, the horizontal retention tanks can be installed for storage, and can come with several additions to suit your needs including baffles, pumping stations, pressurization and can be included at any position on the treatment train.

Tank Diameter	Tank Length (min – max) m	Capacity (min – Max) litres.
1000	4 m – 16m	2900 - 12400
1200	4 m – 16m	4200 - 17800
1500	4 m – 16m	6400 - 27600
1850	4m – 16m	9600 - 41900
2200	4m – 16m	13300 - 58900
2500	4m – 16m	16400 - 75300
3000	4m – 16m	22600 - 107500



HORIZONTAL STORAGE TANKS

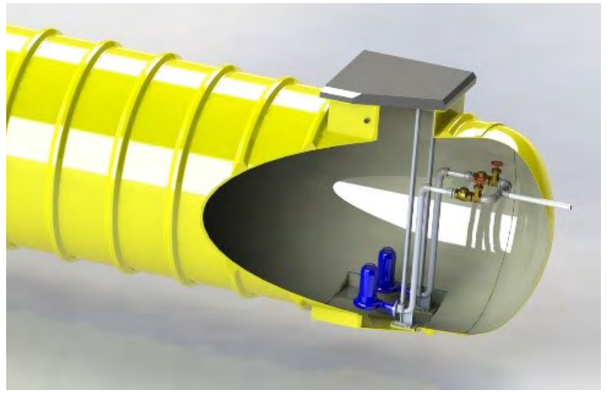
Pumping Station Install

Pumping Station Install
Ability to install pumping stations that consist of pumps, pedestals, piping, valve systems and guiderails.

Piping
- PVC
- Polyethylene

Valves
- Gate Valves
- Swing Check Valves
- Ball Valves
- One-way Valves

Guiderails
- Stainless steel
- Galvanised Steel



Also have the option for Control panels and floats.

Pressurization

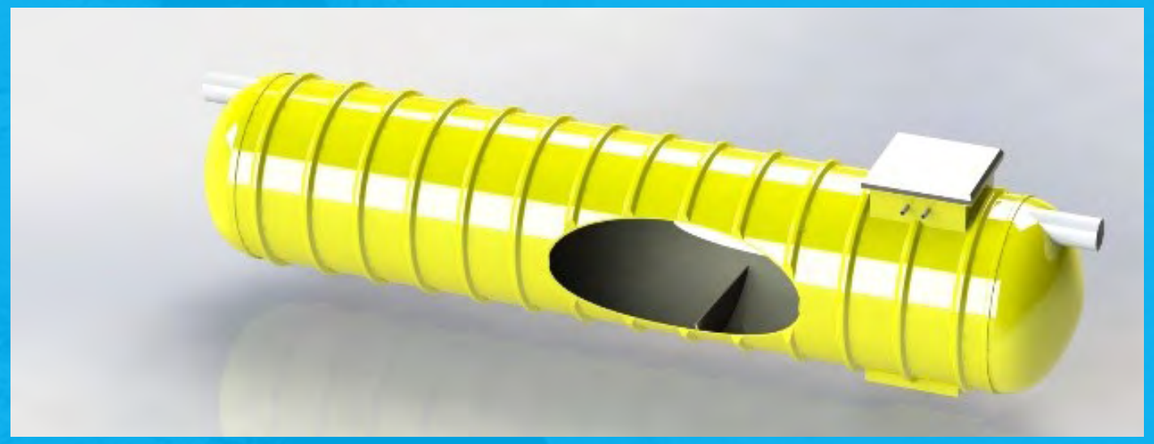
Our models can be pressurized to your any need. With our unique chop hoop filament winding technique and rib designs we can cater to any pressurization requirements.

BAFFLE installation

Option to install Silt Baffle or retention baffle inside the retention tank systems to remove sedimentation from water .

Additional Extras

- Access cover range – Our covers come in a wide range of sizes and span all of the dutt classes (A, B, D and E). They come in Cast iron, aluminium (with safety covers and locks), galvanised and any of your specific needs.
- Inlet and outlet sizing to your requirements



Overview

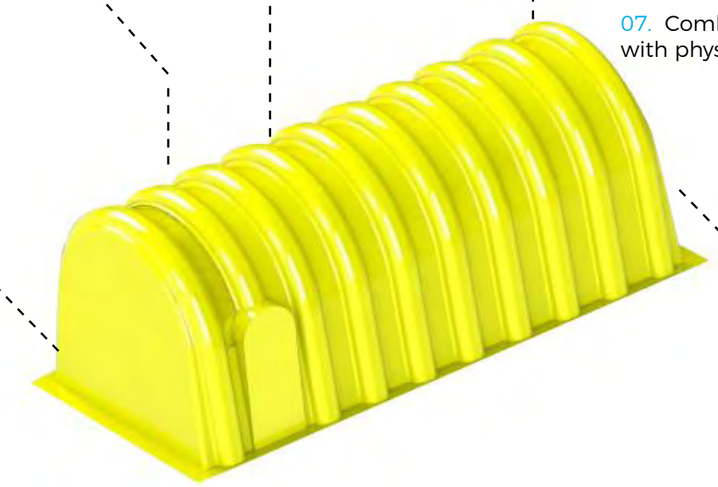
The STORMBRAKE system is a system that incorporates FRP retention systems with efficient stormwater treatment systems. It is a single FRP shell, open bottomed design that easily conjoins to create large arrangements, that stores water as well as simultaneously filtering it. It combines the natural filtration and biofiltration techniques of soil and compressed rocks to remove nutrients, sedimentation and attached particles from the water.

The Process

- Filters using physical and biofiltration processes whilst in retention
- Able to be buried in several layers up to a depth of 10m
- Requires no crane lifting due to lightweight design
- High Load capabilities
- Maintains groundwater base flow to streams

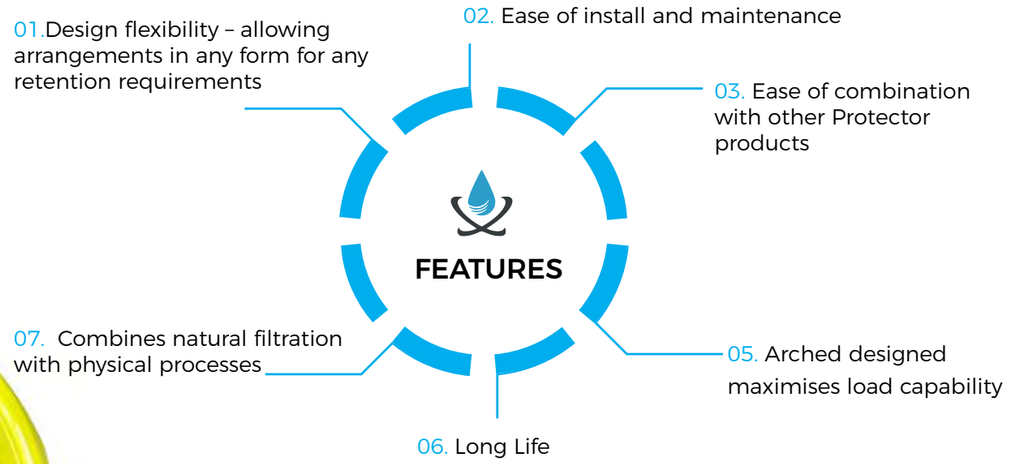
Application

Our StormBrake design is available for application to almost all retention and filtration needs, especially in urban design areas, both commercial and residential in places where the levels of heavy metals, phosphorus and other fine colloidal and attached pollutants are high. If combined with other treatment systems, specifically the tertiary systems that are available from PROTECTOR, this system can be used in almost any application. Hence, we recommend use in the following:



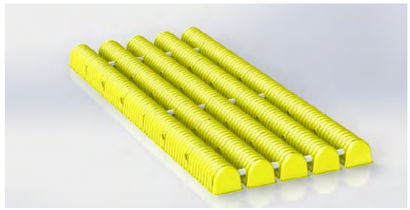
STORMBRAKE

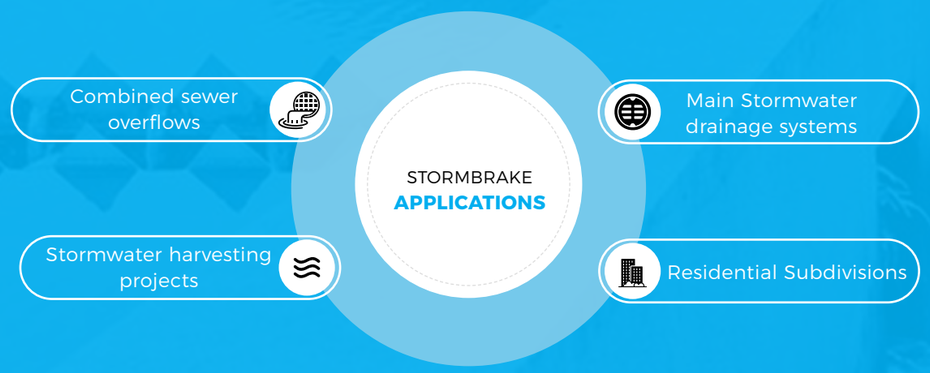
Features

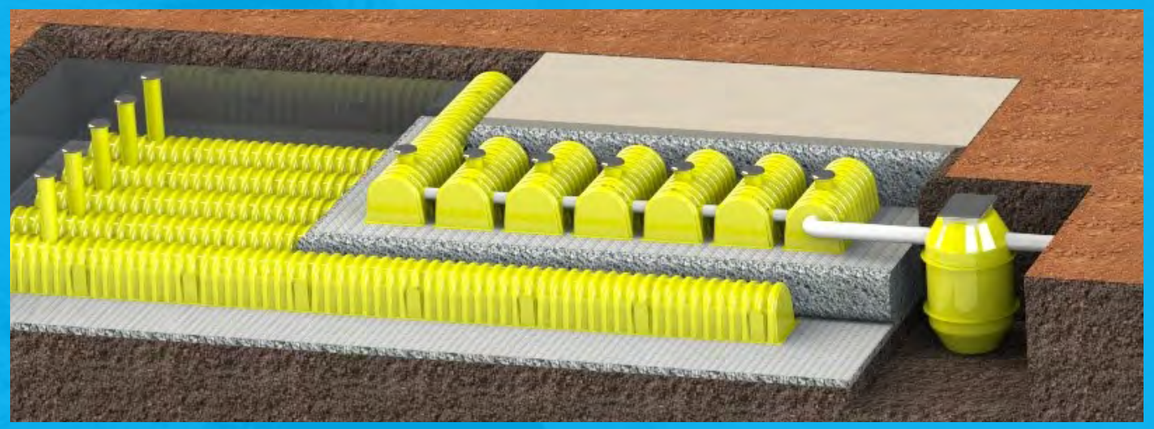


Ranges

The StormBrake system can come in a wide range of arrangements and depth layers. The simple stack design and ease of instalment ensure that this system will suit your any site demand.







OUR PROCESS

Protector products are constructed using the advanced chop hoop filament winding process which ensures circumferential as well as longitudinal strength. Every Protector product has a smooth moulded resin rich corrosion barrier inner layer and an external resin rich water penetration barrier. Being manufactured in FRP (fibre reinforced plastics) Protector products are light, easy to handle and easy to install. The smooth internal moulded finish provides excellent protection against scum build up, exhibit excellent corrosion resistance and are not susceptible to rust.

Having over 20 years of experience in FRP manufacturing and design, our team is able to ensure the finest products available. We are a driven team who has knowledge on every part of the design and manufacturing process to ensure that each step of the construction of your PROTECTOR product is kept up to the highest standards. The dished ends are incorporated during the filament winding process, enabling tanks to be moulded and completed as virtually 'one piece' units. The manufacturing process is carefully monitored with a digital read out system. Chopping glass, winding glass, the resin-rich inner layer and main laminate resins are kept within specification parameters, thus minimising human error. Quality control procedures require each tank to be carefully inspected and tested.

All of the Protector range have been individually engineered to handle the toughest environmental situations and proven in the toughest environments such as high-water tables and volcanic soils. Problems in these areas have been solved with the installation of the StormProtector.

The Packaged StormProtectors are engineered to the following Standards:BS4994 – 1987, AS/NZS 1546.1:1998. Hydraulic and civil engineering can also be provided to your requirements.

Specifications

Throughout our design and manufacture of our various designs we have maintained all of the Australian standards required in out systems.

Construction Standards

ASME RPT-1 Reinforced Thermoset Plastic Corrosion-Resistant Equipment

AS2634 - Chemical plant equipment made from glass-fibre reinforced plastics

AS1546 - Underground tank design

AS1170 - Loading code

Design Methodology

The underground tank Design Methodology is based on the use of the above standards as described, where applicable:

ASME RTP-1 is used to formulae the Design of the shell under external soil/groundwater loading is based on design for external collapse.

AS2634 – is used to formulae the design & manufacture and installation of the Penetrations to the stations

AS1546 is used to formulae the design load of soil/groundwater, and use for the testing methods applied.

AS1170 is used to formulae the design loads from active loads that the stations are subject to, including the required roof slab design. This standard is also used to formulae the ballast requirements for anti-floatation.

Materials of construction

CORROSION

Internal
Internal Corrosion Barrier, moulded with a resin rich C'veil and CSM layers

Resin rich Corrosion barrier constructed from Hetron 922 Vinyl Ester Resin

C'veil will be Regina 80gsm Surface Tissue

The Internal Corrosion Barrier is manufactured in accordance with AS2634

External
External layer will a resin rich CSM layer and C-Glass veil finished with ISO/NPG Flocoat layer for external finish to required colour

REINFORCEMENT

Manufactured using Chop / Hoop Construction, on a computer controlled Filament Winding machine.

Shell Thickness are in accordance to the design requirements set out in the methodology.

Structural layers are constructed from Polyplex Isophthalic Resin with CSM & Hoop in accordance with Ratio's as specified by the design.

Fiberglass 'E' glass is used for both chopped and continuous strands.

TANK

The Pump Station Battered base is circumferentially benched to WSA04—2005

FRP Flanged fittings are made in accordance with AS2634, and flanges are installed as per AS2634. Both the internal and external FRP attachment laminates are in accordance with AS2634

PROTECTOR

Treatment Stages	Product Requirement		Our Products
1. Primary Treament Remove gross pollutants	First flush with oil capture	Gross Pollutant Trap	ECO PROTECTOR
2. Secondary Treament Remove fine particles, sedimention & attached pollutants	95% Hydrocarbon capture	Class 1 By-pass Separators	STORM PROTECTOR
		Class 1 Full Retention Separators	HYDRA PROTECTOR
3. Tertiary Treament Removes very fine/colloidal nutrients & heavy metals	Nutrient reduction and full sediment	90% TSS, 54% TP and 36% TN	MAXI PROTECTOR
		Heavy Metal, TSS and Nutrient reduction	ENVIRO PROTECTOR
		Heavy Metal, TSS and Nutrient	BIO PROTECTOR
		TSS, Sediments, nutrients, phosphorus and heavy metal removal	XTREAM PROTECTOR

KEEP IN TOUCH!

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