

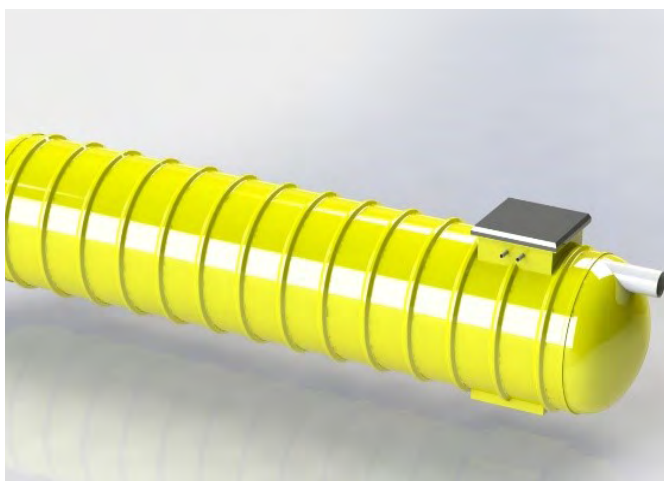
PROTECTOR'S
Retention systems

RETENTION SYSTEMS

Retention systems by PROTECTOR are our high capacity sewerage and stormwater storage systems, made from our fibre glass polymer using our unique chop hoop filament winding technique. These systems seamlessly fit into almost all storm water treatment systems, whether it be as a treatment train or retrofitted. These systems can be used to store almost all types of effluent, due to their corrosive coating, can handle any form of liquid.

At protector we have designed two forms of high capacity retention and storage systems being

HORIZONTAL STORAGE TANK



The Horizontal Storage Tank systems are high capacity storage systems constructed from fibre reinforced polymers and manufactured using our proven chop hoop filament wound construction techniques. With the inclusion of corrosion resistance layers our FRP horizontal storage tanks can last for decades without failure.

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 and pressurization.

THE STORMBRAKE

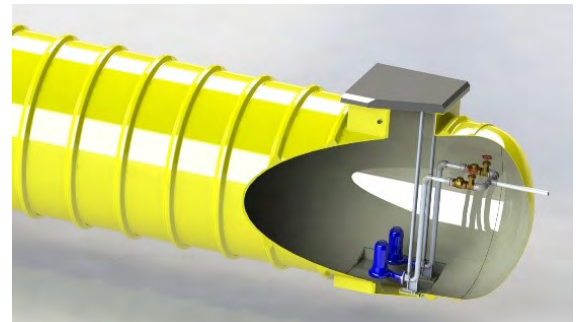
The STORMBRAKE system is one of PROTECTOR'S most advanced designs, utilizing modern and natural processes of filtration to provide a unique, low impact solution to our environmental needs. It is a system that does not require any impermeable bodies for installation, nor does it require concrete casting of any kind, simply requiring natural systems such as soil and compacted stone making it a natural filtration imitation.



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. This system is able to combine the ability to recharge and decontaminate stormwater runoff ground water whilst simultaneously managing the water flow and retaining water to provide the most effective stormwater treatment and management solution available.

HORIZONTAL STORAGE TANKS

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.



RANGE

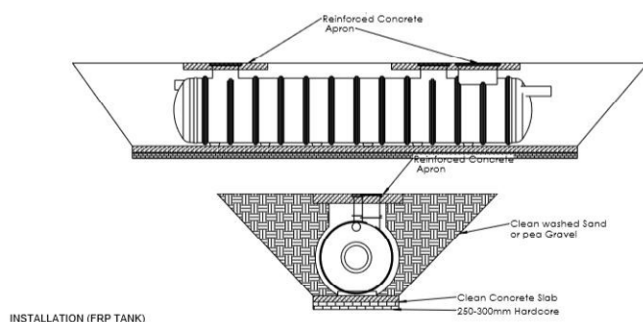
| Tank Diameter | Tank Length (min – max) m | Capacity (min – Max) litres. |
|---------------|---------------------------|------------------------------|
| 1000 | 4 m – 16m | 2900 - 12400 |
| 1200 | 4 m – 16m | 4200 - 17800 |
| 1500 | 4 m – 16m | 6400 - 27600 |
| 1850 | 4m – 16m | 9600 - 41900 |
| 2200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

Our horizontal storage tanks come in a wide variety of ranges but also have a large range of optional extras to ensure that our FRP horizontal storage and retention tanks suit the needs of your site.

With every option that we supply coming fully assembled upon delivery, we take out any stress of determining the best installation system for your horizontal tank needs.

INSTALLATION

Our systems come fully assembled and ready for installation. This allows for simple and easy installation that requires minimum time and minimal construction requirements. Our pre assembled units come as per your requirements, and this advantage of PROTECTOR systems takes our fibre glass treatment and storage systems above all others. A brief installation guide is given below



1. Excavate an area for positioning with suitable easy placing of the tank and filling as well as for consolidating concrete for backfilling.

2. Lifting and handling of the system must use appropriate processes. More details can be found in the Manual. All lifting apparatus (cables, straps, chains etc.) must be provided by a contractor.

3. Installation can be conducted with or without appropriately designed feet for the product, each with their own following installation instruction details found in the Installation Manual.






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 etc. All have been clearly outlined in the installation manual provide by Protector.

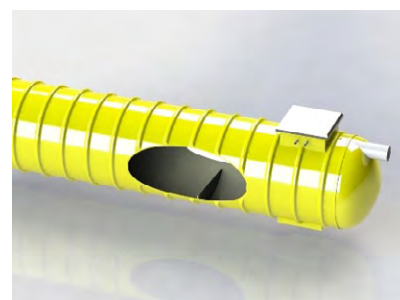
5. Allow for protection of inlets/discharge points/vents to be supervised by contractor. Connect each suitably designed fitting with the desired location for completion.

Pumping station Additional Extras

| Rating | Class A | Class B | Class D | Aluminium Safety Grates | Galvanised Grates |
|----------------------|---|--|--|---|---|
| Duty | Extra light | Light | Heavy | Light | Light to Heavy |
| Ultimate design load | 10kN | 80kN | 210kN | 80kN | 10-210kN |
| Details | Areas (including foot ways) accessible only to pedestrians and pedal cyclists and closed to other traffic | Areas (including footways and light tractor paths) accessible to vehicles (excluding commercial vehicles) or livestock | Carriageways of roads and areas open to commercial vehicles, including fork-lifts, fast moving trucks and aircraft parking | practical and economical solution for a wide range of applications with the benefit of a stylish cover with integral void protection. | Able to be made in any duty. galvanised grates provide a strong cover solution for many areas |
| Wheel loads | 330kG | 2.5 Tonnes | 8 Tonnes | 2.5 Tonnes | 0.3-8 tonnes |

| Part Number | Description | Materials Available | Size |
|----------------|---|---------------------|----------|
| V.RSGV.40.CI | Resilient Seated Gat valve cast iron epoxy coated | Cast Iron | 40NB |
| V.RSGV.50.CI | Resilient Seated Gat valve cast iron epoxy coated | Cast Iron | 50NB |
| V.RSGV.80.CI | Resilient Seated Gat valve cast iron epoxy coated | Cast Iron | 80NB |
| V.RSGV.100.CI | Resilient Seated Gat valve cast iron epoxy coated | Cast Iron | 100NB |
| V.RSGV.40.BRO | Resilient Seated Gate valve | Bronze | 40NB |
| V.RSGV.50.BRO | Resilient Seated Gate valve | Bronze | 50NB |
| V.RSGV.80.BRO | Resilient Seated Gate valve | Bronze | 80NB |
| V.RSGV.100.BRO | Resilient Seated Gate valve | Bronze | 100NB |
| V.RSGV.40.BRA | Resilient Seated Gate valve | Brass | 40NB |
| V.RSGV.50.BRA | Resilient Seated Gate valve | Brass | 50NB |
| V.RSGV.80.BRA | Resilient Seated Gate valve | Brass | 80NB |
| V.RSGV.100.BRA | Resilient Seated Gate valve | Brass | 100NB |
| V.RSGV.CI | Resilient Seated Gat valve cast iron epoxy coated | Cast Iron | 40-100NB |
| V.RSGV.40.BRO | Resilient Seated Gate valve | Bronze | 40-100NB |
| V.RSGV.40.BRA | Resilient Seated Gate valve | Brass | 40-100NB |
| V.SFCG.40.CI | Swing Flex Check Gate Valve | Cast Iron | 40-100NB |
| V.SFCG.40.BRO | Swing Flex Check Gate Valve | Bronze | 40-100NB |
| V.SFCG.40.BRA | Swing Flex Check Gate Valve | Brass | 40-100NB |
| P.PVC | PVC Pipework | PVC | 40-100NB |
| P.PE | Polyethylene Pipework | Polyethylene | 40-100NB |
| G.GS | Galvanised Steel Guiderails | Galvanised Steel | 20-50NB |
| G.SS | Stainless Steel Guiderails | Stainless Steel | 20-50NB |

-  Inlet and outlet sizing to your requirements
-  Guiderails in a range of bore sizes in either stainless steel or galvanised steel
-  Choice of PVC or polyethylene piping choice in a wide range of ID
-  Option to install Silt Baffle or retention baffle inside the retention tank systems to remove sedimentation from water
-  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.



The STORMBRAKE

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.



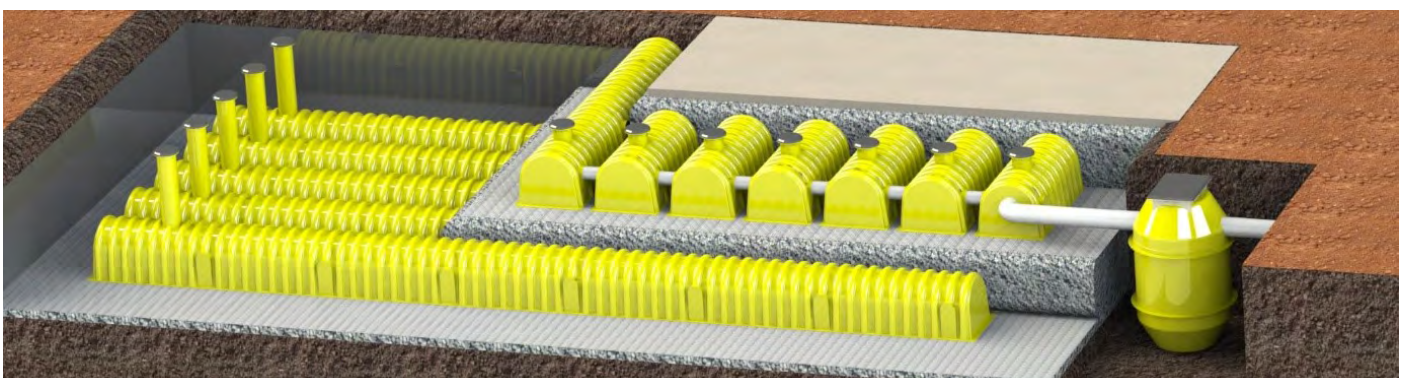
Advantages over Regular Retention Systems

- 💧 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 or need for mechanical lifting machinery due to lightweight design
- 💧 High Load capabilities
- 💧 Maintains groundwater base flow to streams
- 💧 Strong dome FRP shell designed to withstand depth pressure from soil for long life usage
- 💧 Mesh separation layers to provide physical filtration processes of adsorption, attachment and interception
- 💧 Ease of install and maintenance
- 💧 Design flexibility – allowing arrangements in any form for any retention requirements

Applications

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

- 💧 Urban Developments
- 💧 Commercial zones
- 💧 Council and commercial building sites
- 💧 Light pollutant industrial zones



THE PROCESS

The water enters the initial stormbrake chamber, which is considered to be the initial sediment chamber. As the water enters through a 90 degree pipe, the water flow velocity decreases rapidly and is absorbed through the fabric filter layer underneath the Stormbrake chamber. Due to this speed decrease the sediment will mainly build up in this initial chamber, making maintenance process simpler as well as allowing treated water to disperse throughout the rest of the system without any storage reduction. The water will evenly flow throughout each chamber, as well as seeping through the tightly packed rock and filter fabric layered systems into any below layers allowing filtration.

The sedimentation and fine colloidal pollutants are caught throughout the bedrock layer and prevented from flowing throughout the system and out of the filtration. Throughout the soil layers, microorganisms exist to remove nutrients from the system through bio filtration, and this microorganism biodegradation reduces that percentage of nutrients and organic pollutants throughout the system. The water eventually fills to capacity of the storage system and flows downwards through the soil and out of the outlet piping systems below the STORMBRAKE systems. In events of high-flow, the water will flow throughout the system through adjoining piping connections due to the lower flow rate of the soil. This system is able to combine the ability to recharge and decontaminate stormwater runoff ground water whilst simultaneously managing the water flow and retaining water to provide the most effective stormwater treatment and management solution available.



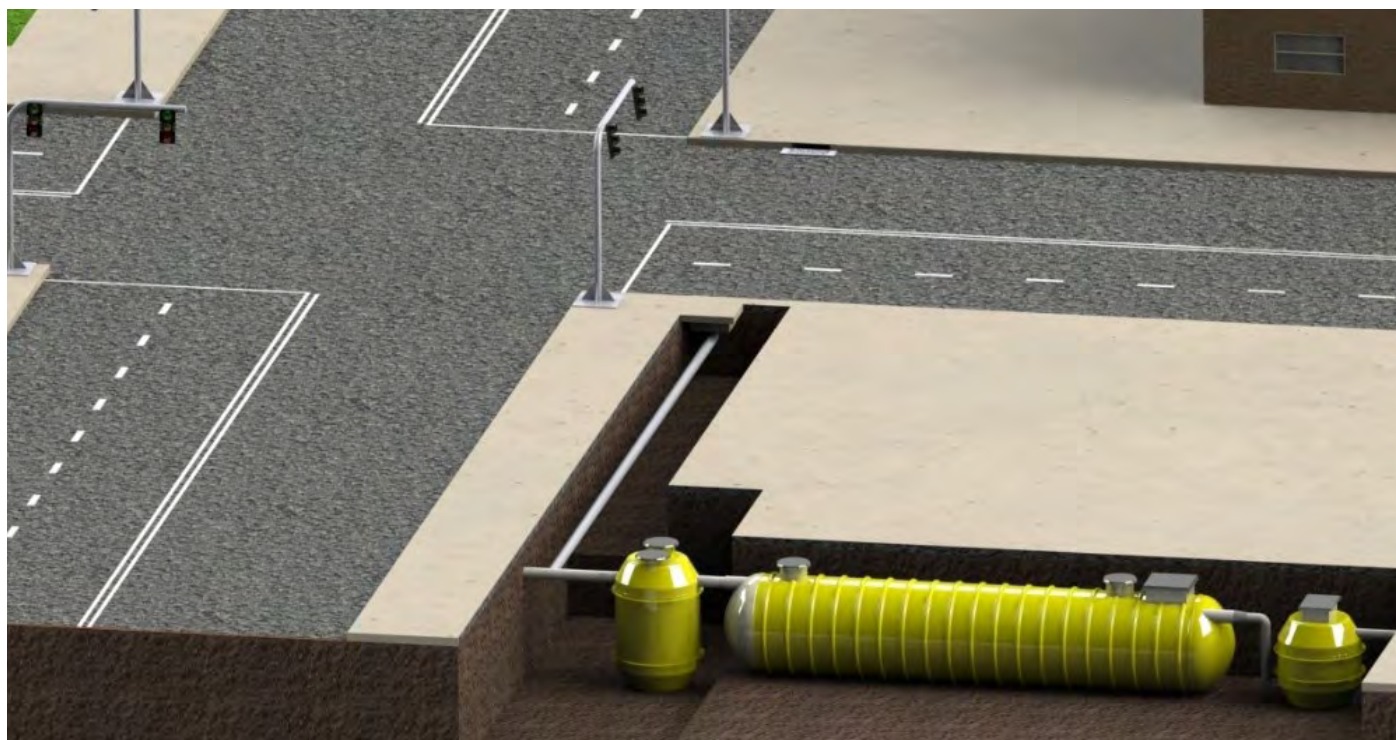
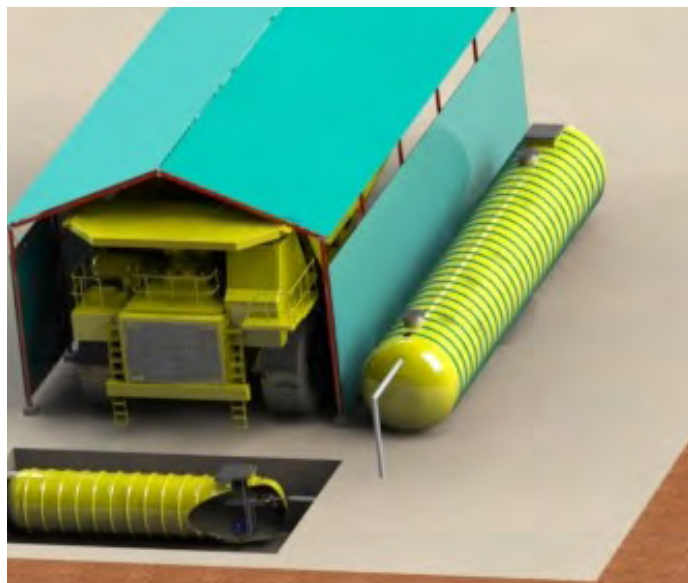
The installation process is simple, due to its low lightweight design it requires no machinery or mechanical lifting devices. The most difficult process of the installation is the site excavation, so before the system arrives ensure that the site is prepared as necessary for the Stormbrake system size. The Process follows:

1. Line the trench walls with the Stormbrake filter fabric
2. Fill the trench with crushed, washed hard stone and level
3. Place the filter netting on the floor of the excavation
4. Remove the shipping straps at the ends of the STORMBRAKE shell to allow overlapping
5. Place the chambers on the filter netting in long rows, ensuring the first rib is overlapping the last rib and screw the chambers together.
6. Install all piping and manholes
7. Backfill the system with hard stone to cover and level with a vehicle weighing no more than 500kg.

TREATMENT TRAINS

THIS IS A FOURTH STEP IN THE STORMWATER TREATMENT TRAIN, FOLLOWING PRIMARY, SECONDARY AND TERTIARY TREATMENT STAGES

With the addition of the storage and retention systems in our protector storm water treatment and management systems makes PROTECTOR treatment solutions the complete packaged. PROTECTOR is able to supply all forms of the treatment train system, from our primary gross pollutant trap treatment systems, to our hydrocarbon high capacity oil coalescing treatment systems to our complex tertiary treatment systems. With this fourth addition to the treatment train we provide the option for high capacity retention and storage of the treated stormwater, able to be pumped into any proceeding waterways or water system.



THE NEED

There is an endless need for improving the environmental stability of our society. Pollution and environmental impacts is something that every company needs to have in mind in everything they do. We at PROTECTOR are designing solutions to the problems we face, attempting to solve one of the biggest pollutant issues in Australia; Water pollution. Pollutants from run off that include chemicals, nutrients, hydrocarbons and gross pollutants contaminate our water supply and cause major environmental issues. We here at PROTECTOR are solving this with our wide range of stormwater treatment systems that are all designed to treat all forms of stormwater pollution and any sites demands.

OTHER 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

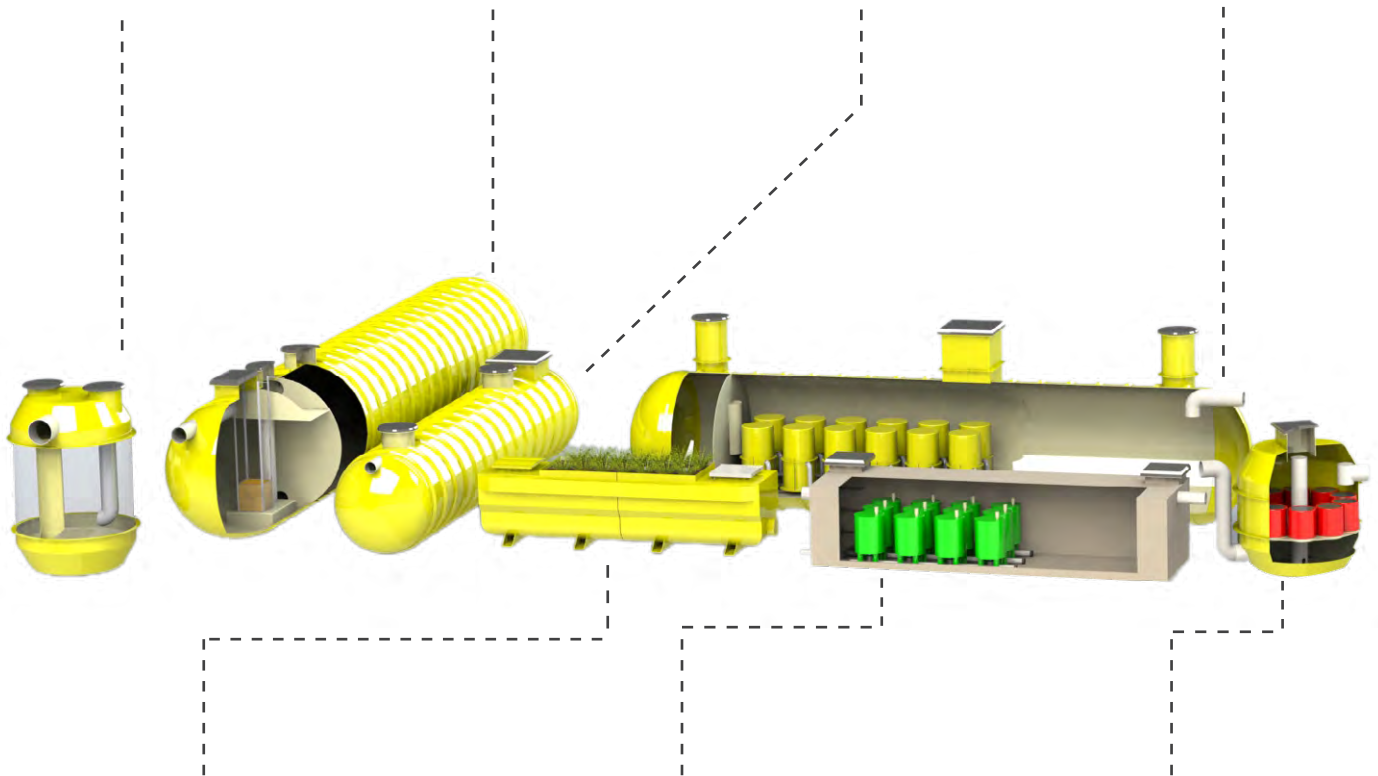


Highly efficient, full retention separator to treat first flush, fine particulates, nutrients, heavy metals and hydrocarbon filtration system.

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.