

Filtterra® Bioscape™

Operation & Maintenance Manual



Stormwater360
AUSTRALIA

1 GENERAL

1.1 Description

The following general specifications describe the general operations and maintenance requirements for the Filterra Bioscape system. The system takes advantage of the physical, chemical and biological mechanisms of a media, plant and microbe complex to remove pollutants typically found in urban stormwater runoff. Maintenance is a simple, inexpensive and safe operation that does not require confined space access, pumping or vacuum equipment, or specialized tools. Properly trained landscape personnel can effectively maintain Filterra Bioscape systems by following instructions in this manual with the approved materials.



1.2 Basic Operation

The Filterra Bioscape system is a specialised compact high flow bioretention system. Stormwater runoff typically enters the system through a Bioscape Inlet structure or forebay to direct water into the media area and allow larger storm flows to bypass (other means are also acceptable). The stormwater then is directed over the 75mm layer of mulch on the surface of the filter media. As the water passes through the mulch layer, many of the larger sediment particles and heavy metals are removed through sedimentation and chemical reactions with the organic material in the mulch. Water passes through the media where the finer particles, nutrients and heavy metals are removed and other chemical reactions take place to immobilise and capture pollutants. The treated water passes into an underdrain and flows to a pipe system or other appropriate discharge point. Once the pollutants are captured in the media, bacteria within the plant root ecosystem begin to break down and metabolise some pollutants, while the plants begin to uptake and metabolise other pollutants, such as heavy metals, which are chemically bound to organic particles in the mulch. Other pollutants such as phosphorus are chemically bound to the media particles and are also available to the plants and bacteria in their metabolic processes. Nitrogen goes through a very complex variety of biochemical processes where it can ultimately end up in the plant/bacteria biomass, turned to nitrogen gas or dissolves back into the water column as nitrates depending on media temperature, pH and the availability of oxygen. The pollutants ultimately are retained in the mulch, media and biomass.

2 MAINTENANCE

2.1 Why Maintain?

All stormwater treatment systems require maintenance for effective operation. This necessity is often incorporated into the development application and approval process. Benefits of maintenance of the Filterra Bioscape system include:

- Prolong the expected lifespan of your Filterra media.
- Avoid more costly media replacement.
- Maintain aesthetics of your Filterra Bioscape system.
- Help reduce pollutant loads leaving your property.
- Avoid legal challenges from your local, state or federal government authorities.

Simple maintenance of the Filterra Bioscape system is required to continue the effective pollutant removal from stormwater runoff before discharge into downstream waters. This procedure will also extend the longevity of the living biofilter system. The unit will recycle and accumulate pollutants within the biomass, but is also subjected to other materials entering the system. This may include litter, sediment and leaves etc. which will collect on top of the mulch layer. Too much sediment may inhibit the Filterra system flow rate. Regular replacement of the mulch stops accumulation of such sediment.

2.2 When Maintain?

Stormwater360 includes a 1-year Activation and Maintenance Service with each Filterra Bioscape system purchase. Annual included maintenance consists of a maximum of two (2) scheduled visits. Additional maintenance may be necessary depending on sediment and trash loading (by Owner or at additional cost). The start of the maintenance plan begins when the system is activated for full operation. Full operation is defined as the system fully installed, when underdrain piping, media, mulch and plants are added.

Activation can be scheduled once the site is **fully** stabilized (full landscaping, grass cover, final paving and street sweeping completed). Maintenance visits are scheduled seasonally for the system to remove excessive leaf litter and sediments.

Varying land uses can affect maintenance frequency; e.g. some fast food restaurants require more frequent litter removal. Contributing drainage areas which are subject to new development wherein the recommended erosion and sediment control measures have not been implemented may require additional maintenance visits. Additionally, some sites may be subjected to extreme sediment or litter loads, requiring more frequent maintenance visits. When performing maintenance, it is important to note all actions in a log (examples included), to assist the owner and maintenance provider in predicting future maintenance frequencies.

Owners must promptly notify the maintenance provider of any damage to the plant(s), which are an integral part of the bioretention technology. Owners should also advise other landscape or maintenance contractors not responsible for the Filterra Bioscape system to refrain from maintenance of the system (i.e. no pruning or fertilizing).

Each included maintenance visit consists of the following simple tasks (detailed instructions below):

1. Inspection of Filterra Bioscape system and surrounding area, including Bioscape Inlet forebay.
2. Removal of foreign debris, sediment, mulch & litter from inlet and filter surface.
3. Filterra media inspection. No replacement is usually required, but if necessary, the Filterra engineered high flow bioretention media is available from a Stormwater360 Certified Party Maintenance Provider.
4. Plant health evaluation, pruning and/or replacement as necessary.
5. Mulch replacement with approved mulch.
6. Update Maintenance records (reports available upon request).

2.3 Maintenance Tools, Safety Equipment and Supplies

Ideal tools include: camera, bucket, shovel, broom, pruners, hoe/rake, and tape measure. Appropriate Personal Protective Equipment (PPE) should be used in accordance with local or company procedures. This may include impervious gloves where the type of trash is unknown, high visibility clothing, barricades when working in close proximity to traffic and safety hats, glasses, and shoes.

Most visits require minor trash removal and a full replacement of mulch. Mulch should be a double shredded, hardwood variety; do not use colored or dyed mulch. Please contact Stormwater360.



2.3 Maintenance Visit Procedure

1. Inspection of Filterra and Surrounding Area.

Record individual systems before maintenance with photographs. Record on Maintenance Report the following:

Standing Water	<input type="checkbox"/>	YES	<input type="checkbox"/>	NO
Bypass Clear	<input type="checkbox"/>	YES	<input type="checkbox"/>	NO

If answering “yes”, document with photographs.

2. Remove sediment, debris, and litter from Inlet structure (if applicable)

Record on Maintenance Report the following:

Number of Buckets/Bags filled with pollutants/or approximate volume

3. Remove debris, litter and mulch from the Filterra media surface

Record on Maintenance Report the following: Sediment / Clay ☐ YES ☐ NO

Bypass Clear	<input type="checkbox"/>	YES	<input type="checkbox"/>	NO
Leaves	<input type="checkbox"/>	YES	<input type="checkbox"/>	NO

Number of Buckets/bags removed:

4. Mulch Replacement

Add mulch evenly across entire system to a depth of 75mm.

5. Vegetation health evaluation and pruning

Examine the vegetation health and replace if necessary. Prune vegetation to encourage growth in the correct directions. Since Filterra Bioscape systems can contain many plants, only notation of individual damaged or unhealthy plants is necessary.

- Record on Maintenance Report the following: Vegetation Health
- Vegetation Damage
- Document damaged or unhealthy plants with photographs.

6. Clean side slopes and area around the Filterra Bioscape system

Remove all trash and debris to be disposed of appropriately.

7. Complete paperwork

Complete Maintenance Report, and deliver with photographs via email to Stormwater360 if within the first year. Some local government authorities require submission of maintenance reports in accordance with approvals. It is the responsibility of the owner to comply with local regulations.

3 Exclusion of Services

It is the responsibility of the owner to provide adequate irrigation when necessary to the plants of the Filterra system. Please refer to “Planting Requirements for Filterra Systems”.

Clean up due to major contamination such as oils, chemicals, toxic spills, etc. will result in additional costs and are not covered under the provided Filterra Bioscape Activation and Maintenance service for the first year. Should a major contamination event occur, the owner must block the outlet pipe of the Filterra (where the treated runoff drains) and block off the inlet to the Bioscape (and other drainage piping) entering the Filterra Bioscape system. The maintenance provider should be informed immediately.