



Ecosol™ Storm Pit (Class 2)  
Technical Specification



Restoring our Waterways  
to the Way Nature Intended



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## 1.0 Introduction

Increasingly stringent environmental best management practice requires planners and developers to apply a fit-for-purpose treatment train approach to stormwater treatment to achieve today's water quality objectives (WQO's).

An integral element to any good WSUD is primary and secondary treatment of stormwater flows to remove coarse sediment and gross pollutants prior to tertiary treatment.

The Ecosol™ Storm Pit (Class 2) is a modern, fully self contained stormwater treatment system that provides primary and secondary treatment of stormwater pollutants within the one compact device.



Ecosol™ Storm Pit (Class 2)  
Typical Configuration

In particular it is designed to remove, at pre-determined treatable flows, particulate, dissolved and in some cases colloiddally bound contaminants such as:

- suspended solids;
- heavy metals;
- oil & grease;
- hydrocarbons;
- nitrogen; and
- phosphorous.



Ecosol™ Storm Pit (Class 2)  
Typical Configuration

The Ecosol™ Storm Pit (Class 2) is an all-in-one primary and secondary filtration system that helps overcome the need for multiple treatment measures on small catchments. It has been designed specifically to meet today's stringent water quality targets. In developing this innovative stormwater treatment system careful consideration has been given to durability, longevity, cost and maintainability. Key commercial technical features include:

- widely available chemically conditioned filtration medias;
- a system capable of achieving low pollutant discharge levels;
- low visual impact and energy footprint;
- designed hydraulics with proven performance and longevity;
- scalable design; and
- cost effective maintenance regime.

This technical manual describes the operation and performance characteristics of the system.

## 2.0 How the Ecosol™ Storm Pit (Class 2) Works

The Ecosol™ Storm Pit (Class 2) is an all-in-one primary and secondary filtration system that helps overcome the need for multiple treatment measures on small catchments.

The system is ideally suited for smaller catchments such as commercial car park applications with inlet flows ranging from 10 – 110L/s. It provides a compact, cost efficient treatment solution specifically targeting suspended solids, heavy metals, phosphorous, nitrogen and free floating oils and grease. Housed in a pre-cast concrete pit, the unit consists of a primary treatment inlet litter basket designed to capture and retain all particles larger than 200 micron and then incorporates a series of internal baffles for retention of hydrocarbons in a spill situation and the retention of particles (> 93 micron). It also includes a unique patented multi barrier media filter for secondary treatment.

Stormwater flows enter the primary treatment chamber where pre-screening occurs via the primary filtration basket. Filtered stormwater then enters the sump (also known as the detention bay) consisting of a series of flow dissipating baffles where oils and floatables rise and settling material drops out of the flow by gravitational separation. This pre-treatment of incoming stormwater flows, significantly enhances the performance and operational life of the multi barrier filter bed as only a fraction of the finer particles <93 micron are released into the secondary treatment chamber at predetermined flows.

Flows from this primary treatment chamber are then diverted to the secondary treatment chamber where it then passes up through the multi-barrier filter bed for removal of particulate, dissolved and colloiddally bound contaminants. The treated stormwater then discharges through the outlet pipe to the drainage network.



Ecosol™ Storm Pit- Class 2 (20L/s)  
Typical Configuration





## 2.0 How the Ecosol™ Storm Pit (Class 2) Works continued

The multi barrier media bed comprises of the following three filtration media's:

- Porous Polypropylene –designed to remove fine solids, oil & grease, and particulate bound contaminants aiming to protect and increase the lifespan and performance of the secondary filter media;
- Chemically conditioned Clinoptilolite – designed to remove mainly positively charged dissolved contaminants and in some cases colloiddally bound contaminants. In particular heavy metals such as mercury, cadmium, chromium, nickel, zinc, copper, lead and nutrients such as ammonium nitrogen;
- Laterite – designed to remove negatively charged dissolved contaminants. In particular heavy metals such as arsenic and nutrients such as nitrate nitrogen and phosphate. In addition this layer functions as a final polishing step to achieve stringent discharged limits in regard to heavy metal concentrations.

One of the great advantages of the Ecosol™ Storm Pit (class 2) multi-barrier filter bed is its flexibility. A tailored filter bed arrangement with specific layer characteristics can be provided to accommodate site specific requirements. For example, if there is a need to target the removal of copper, zinc and/or lead then the Clinoptilolite layer can be designed thicker than the other two layers. Alternatively, if arsenic or phosphorous is a key focus then a thicker laterite layer can be incorporated. This tailored solution achieves higher performance and ensures a longer filter media bed operational life.



Images of a typical Ecosol™ Storm Pit (Class 2) components

### 3.0 Ecosol™ Storm Pit (Class 2) Credentials and Case Studies

Urban Asset Solutions Pty Ltd has always sought pro-actively to validate its products through independent laboratory and extensive field testing. The test results have been verified, where appropriate, by computer simulation and industry peers.



The multi-barrier filter bed as well as its three specific filter materials have been trialled in water, wastewater, and stormwater treatment applications around the world. The results obtained have been published in peer review journals and international conference proceeding's. This section summarises the findings of these studies.

#### Otsu, Shiga-Japan Trial

A stormwater treatment device packed with Porous Polypropylene media was trialled in Otsu, Shiga-Japan along the roadway of route 165 between October 2000 and January 2001 (Saburo Matsui et al., 2003). Eight rainfall events were monitored with the total rainfall and maximum intensity ranging from 7mm to 51mm and from 2mm/hr to 10mm/hr, respectively. The mean removal efficiency for pollutants studied was 92.3% for Total Suspended Solids (TSS), 71.9% for Chemical Oxygen Demand (COD), and 43.6% for Total Phosphorous (TP) and above 70% and 60% for the heavy metals and Polycyclic Hydrocarbons (PAHs), respectively.

#### Wastewater Trials

Clinoptilolite's high selectivity for  $\text{NH}_4\text{-N}$  is very well known in municipal and agricultural wastewater treatment. Examples of the application of Clinoptilolite in wastewater include:

- A 27 ML/d capacity plant at Lake Tahoe, California, used several hundred tonnes of Clinoptilolite from the Hector deposit (Butterfield and Borgending 1981),
- Wastewater plants with capacities of 45 and 245 ML/d in Virginia, USA (Gunn 1979).
- Pig farm wastewater with 10,000 pigs (150 m<sup>3</sup>/d) was treated in a cascade multi-step system using mechanical, chemical, and biological processes (Zubaly et al., 1991). Large suspended particles were first removed by grating the sewage. Suspended particles, colloids and dissolved organic and inorganic species not removed by the grate were then passed through a channel (six 20m sections separated by barrages). Approximately 20m<sup>3</sup> of Clinoptilolite from the Tokaj Hills deposit in Hungary were placed in each section. The Clinoptilolite filter removed 100% of oils and fats, 98% of suspended solids and 95% of dissolved organic and inorganic impurities from the wastewater. The Clinoptilolite filters successively removed these impurities for two years. The exhausted Clinoptilolite was then used as a fertiliser.

Several studies that illustrate the effective use of Clinoptilolite for the removal of  $\text{NH}_4\text{-N}$  have been published in the last 20 years (Hankins et al., 2004; Sprynskyy et al., 2005; Aiyuk et al., 2004).



### 3.0 Ecosol™ Storm Pit (Class 2 ) Credentials and Case Studies continued

Clinoptilolite has been used as a natural ion exchanger for the removal of radioactive cations such as Cs<sup>+</sup> and Sr<sup>2+</sup> and heavy metal cations such as Cu<sup>2+</sup>, Cd<sup>2+</sup>, Zn<sup>2+</sup>, Ni<sup>2+</sup>, Pb<sup>2+</sup>, Hg<sup>2+</sup>, Cr<sup>3+</sup>, and Mn<sup>2+</sup>. Examples of full scale applications using zeolites such as Clinoptilolite for the removal of Cs<sup>+</sup> and Sr<sup>2+</sup> from radioactive wastes are (Mercer and Ames, 1978):

- Hanford Nuclear Lab., Washington, USA;
- Idaho National Engineering Laboratory, Idaho, USA;
- Savannah River Plant, Aiken, South Carolina, USA; and
- British Nuclear Fuels, Sellafield, USA.

#### University of Munich Trial

A Clinoptilolite cartridge filter was trialled in Garching campus of the Technical University of Munich, in Germany treating the runoff from an eleven years old zinc roof (Athanasiadis et al., 2004). Samples of 24 rain events were examined and zinc was detected in the roof runoff in concentrations up to 25 mg/L, and lead which originated from the tin-solder was present in concentrations up to 84 µg/L. The Clinoptilolite filter was able to remove up to 97% of zinc from the roof runoff.

#### Academy of Fine Arts, Munich Trial

A technical infiltration system equipped with Clinoptilolite as an artificial barrier material for the treatment of copper roof runoff was installed and monitored in the Academy of Fine Arts in Munich, Germany (Athanasiadis et al., 2007). During the 2yr sampling period, 30 rain events were examined. The technical infiltration system was able to reduce the copper concentration from the roof runoff by a factor up to 96%.



THE UNIVERSITY  
of ADELAIDE

#### University of Adelaide Trial

Urban Asset Solutions Pty Ltd has always sought pro-actively to validate all its products' performance through extensive independent laboratory and field testing. In May 2014 Ecosol commissioned EngTest the commercial arm of the University of Adelaide, Sim Physics Pty Ltd and GHD to undertake additional laboratory and desktop modelling to further confirm the products performance. Several additional field pilot sites are currently being established with additional product performance technical reports to be peer reviewed and published.

## 4.0 Warranty and Life Expectancy

The Ecosol™ Storm Pit (Class 2) has a one-year warranty covering all components and workmanship. Urban Asset Solutions Pty Ltd will rectify any defects that fall within the warranty period. The warranty does not cover damage caused by vandalism and may be invalidated by inappropriate cleaning procedures or where the unit is not cleaned within the recommended frequency. The 200 micron primary treatment filtration basket has a life expectancy of 5 years whilst the stainless steel flow disrupting baffles and multi-barrier media bed framework all has a life expectancy of 15 years and the pre-cast concrete pit has an estimated 50-year life span.

## 5.0 Safety Considerations

The simple, yet effective design of the Ecosol™ Storm Pit (Class 2) reduces OH&S risks as most of the work is undertaken in a controlled factory environment. The unit arrives to site complete and ready for installation reducing significantly on-site time, an important factor given the costs associated with delays that can be caused by inclement weather. The lockable access lids reduce the likelihood of vandalism and are easily removed by hand using readily-available lifters.

## 6.0 Environmental Impact

Urban Asset Solutions Pty Ltd is accredited to ISO 14001 (Environment) and undertakes all manufacturing and construction within the requirements of this Standard. Hence, its carbon impact is limited and as the Ecosol™ Storm Pit (Class 2) is housed in a pre-cast pit and is usually located underground it has little or no impact on the environment with the access lids designed to blend in with the surrounds of the site.





## 7.0 Key Features and Benefits

The Ecosol™ Storm Pit (Class 2) is a fully self-contained system supplied to site ready to install thereby reducing on site construction lead-times and disruption to the general public. The Ecosol™ Storm Pit (Class 2), is designed as a compact total treatment system incorporating primary and secondary treatment within the one underground device. The system has its own unique features and benefits, some of which are listed below:

Ecosol™ Storm Pit (Class 2)	
Key Features	Benefits
Hydraulics	<ul style="list-style-type: none"> <li>• Minimal head/hydraulic loss</li> <li>• Does not affect stormwater inlet capacity</li> <li>• Treats 100% of incoming flows up to the designed TFR</li> </ul>
Pollutant Capture and Retention	<ul style="list-style-type: none"> <li>• All-in-one, cost-efficient primary and secondary filtration system</li> <li>• Retains free floating hydrocarbons</li> <li>• No remobilisation of captured pollutants</li> </ul>
Design and Construction	<ul style="list-style-type: none"> <li>• Arrives on-site complete with all components fitted ensuring easy and safe installation</li> <li>• Simple compact trafficable design with durable, corrosive-resistant materials</li> <li>• Can be retrofitted to most existing stormwater systems</li> <li>• Product is made in-house thereby reducing lead times significantly</li> </ul>
Cleaning and Maintenance	<ul style="list-style-type: none"> <li>• Can be inspected from the surface without removing the access lids</li> <li>• Easily cleaned and maintained either manually or by small eductor truck</li> <li>• Dry storage of gross pollutants helps reduce the risk of toxic fermentation</li> <li>• Pollutants do not need to be handled during cleaning</li> </ul>
Environmental Impact	<ul style="list-style-type: none"> <li>• Effective mini-treatment train system helps achieve water quality objectives</li> <li>• Unit is housed in its own pit underground with little effect on the site aesthetics</li> </ul>
Tried and Tested	<ul style="list-style-type: none"> <li>• Independently tested</li> <li>• Meets all relevant industry standards and guidelines</li> </ul>

Figure 1 - Ecosol™ Storm Pit (Class 2) Key Features and Benefits

## 8.0 Key Dimensions

The Ecosol™ Storm Pit (Class 2) product range has been designed to help practitioners meet today's stringent water quality objectives. Whether installed at-source, in-line, or end-of-line the system is adaptable to most applications. Table 1 highlights the key dimensions for the range of Ecosol™ Storm Pits (Class 2).

This system is also designed to target gross pollutants, coarse sediment and hydrocarbons however it is also designed to remove, at pre-determined treatable flows, particulate, dissolved and in some cases colloiddally bound contaminants such as:

- suspended solids;
- heavy metals;
- nitrogen; and
- phosphorous.

Table 1 highlights the key dimensions for the Ecosol™ Storm Pit (Class 2) product series.

Product Code	Maximum Outlet Pipe Diameters (Assumed 1% Gradient)	Approximate External Unit Dimensions (L x W x D below invert)	Loading classification	Pollutant Holding Capacities		
				Gross Pollutants	Sediment	Hydrocarbons
				(m <sup>3</sup> )	(m <sup>3</sup> )	(L)
Storm Pit (Class 2) 10L/s	300mm	2700 x 1350 x 1600	D	0.182	0.560	828
Storm Pit (Class 2) 20L/s	300mm	3600 x 1650 x 1600	D	0.243	0.870	1,397
Storm Pit (Class 2) 30L/s	450mm	4500 x 1950 x 1600	D	0.304	1.000	2,400
Storm Pit (Class 2) 40L/s	450mm	4500 x 1950 x 1600	D	0.304	1.000	1,620
Storm Pit (Class 2) 60L/s	525mm	5600 x 2300 x 1600	D	0.364	1.575	2,520
Storm Pit (Class 2) 80L/s	525mm	6500 x 2600 x 1600	D	0.425	2.310	3,780
Storm Pit (Class 2) 110L/s	600mm	7450 x 2950 x 1600	D	0.486	3.240	5,184

Table 1 – Ecosol™ Storm Pit (Class 2) Key Dimensions

Please Note: For optimal performance this system requires a minimum drop from the grated inlet or inlet pipe invert to the outlet pipe invert level of 500mm.

The below table provides general information of the typical Ecosol™ Storm Pit (Class 2) multi barrier media bed replacement material volumes and approximate bed dimensions:

Product Code	Maximum Bed Dimensions (Length x Width)	Polypropylene		Clinoptilolite		Laterite	
		Volume	Bed Depth	Volume	Bed Depth	Volume	Bed Depth
		(m <sup>3</sup> )	(mm)	(m <sup>3</sup> )	(mm)	(m <sup>3</sup> )	(mm)
Storm Pit (Class 2) 10L/s	1100 x 900 x 800	0.198	200	0.297	300	0.297	300
Storm Pit (Class 2) 20L/s	1670 x 1200 x 800	0.401	200	0.401	200	0.802	400
Storm Pit (Class 2) 30L/s	2000 x 1500 x 800	0.601	200	0.601	200	0.202	400
Storm Pit (Class 2) 40L/s	2670 x 1500 x 800	0.801	200	0.801	200	1.602	400
Storm Pit (Class 2) 60L/s	3350 x 1800 x 800	1.206	200	1.206	200	2.412	400
Storm Pit (Class 2) 80L/s	3850 x 2100 x 800	1.617	200	1.617	200	3.234	400
Storm Pit (Class 2) 110L/s	4600 x 2400 x 800	2.208	200	2.208	200	4.416	400

Table 2 – Ecosol™ Storm Pit (Class 2) Key Multi-Barrier Filter Media Dimensions and Volumes.

## 9.0 Hydraulic Specification

Treatable Flow Rate (TFR) is defined as the maximum flow rate through the Ecosol™ Storm Pit (Class 2) before flows surcharge and commence by-passing the system untreated. For the purpose of assisting designers we have adopted conservative values and recommend designing the system with an outlet at 1% gradient to achieve optimal capture efficiencies and maximum treatable flow rates. Further each system has been designed specifically to cater for peak flow by-pass conditions in the event that the system is full of contaminants and a significant storm event is occurring. This fail safe by-pass eliminates the risk of potential localised flooding.

### 9.1 The Ecosol™ Storm Pit (Class 2) Hydraulic Specification

The Ecosol™ Storm Pit (Class 2) is designed to treat stormwater runoff for typical urban catchments up to 3.0 Ha, based on the product selection and on a 100% impervious catchment area. The system provides both primary and secondary treatment within the one compact underground device thereby reducing the space and cost of downstream tertiary treatment measures.

Product Code	Maximum Outlet Pipe Diameter	Maximum Treatable Flow Rate (L/s)	Design Flow m <sup>3</sup> /s	Optimal Catchment Area
	(Assumed 1% Gradient)	(L/s)	(m <sup>3</sup> /s)	Ha
Storm Pit (Class 2) 10L/s	300mm	11	0.097	1.5
Storm Pit (Class 2) 20L/s	300mm	22	0.097	1.5
Storm Pit (Class 2) 30L/s	450mm	30	0.265	1.8
Storm Pit (Class 2) 40L/s	450mm	40	0.265	1.8
Storm Pit (Class 2) 60L/s	525mm	60	0.337	2.4
Storm Pit (Class 2) 80L/s	525mm	80	0.337	3.0
Storm Pit (Class 2) 110L/s	600mm	110	0.494	3.0

Table3 – Ecosol™ Storm Pit (Class 2) Hydraulic Specification.



## 10.0 Collection and Removal Efficiencies

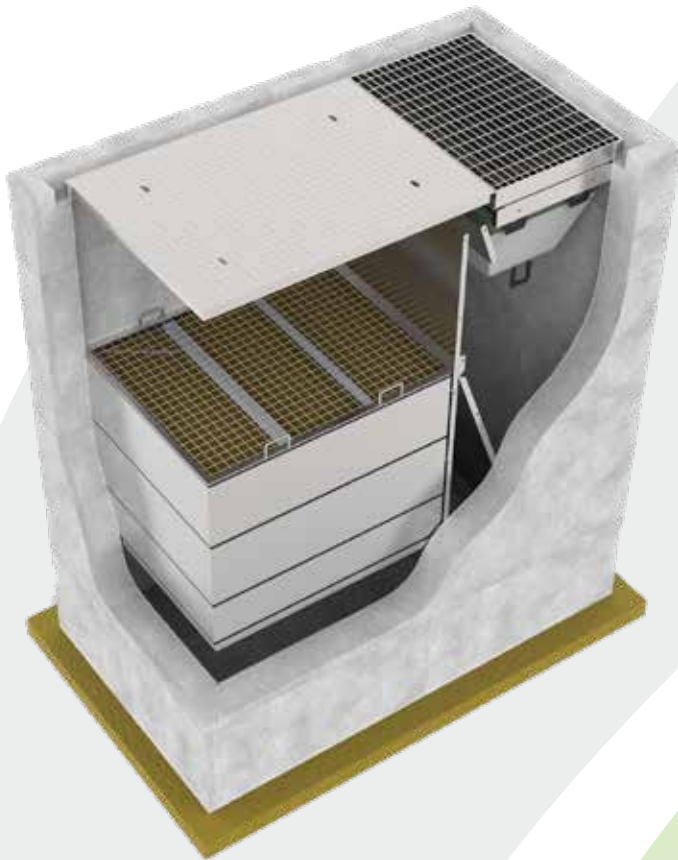
In recent years modern Water Sensitive Urban Design (WSUD) objectives and principles now applied to most urban development's require more onerous water quality objectives (WQO's) specifically targeting the removal of suspended solids, nitrogen, phosphorus and heavy metals.

The Ecosol™ Storm Pit (Class 2) provides engineers with a compact treatment measure that when implemented with other measures such as rain gardens or swales will achieve the necessary Water Quality Objectives. The Ecosol™ Storm Pit (Class 2) is the ideal treatment solution for applications where space is limited.

### ECOSOL STORM PIT - CLASS 2 CAPTURE EFFICIENCY PERFORMANCE SUMMARY

POLLUTANT	CAPTURE EFFICIENCY	DETAILS
Gross Pollutants (GP)	98%	Particulate > 200 micron
Total Suspended Solids (TSS)	72%	Suspended Particulate
Total Phosphorus (TP)	50%	Particulate and dissolved
Total Nitrogen (TN)	43%	Particulate and dissolved
Heavy Metals	32%	Particulate and dissolved
Total Petroleum Hydrocarbon (TPH)	80%	Particulate and dissolved

Table 4 – Ecosol™ Storm Pit (Class 2) Pollutant Removal Efficiencies.



1) Typical pollutant removal efficiencies based on results derived from the independently tested Ecosol™ Litter Basket and Ecosol™ Storm Pit (Class 2) published performance data.

2) Independently field tested and evaluated by the University of Adelaide (Eng Test - School of Civil Environmental and Mining Engineering) and Moreton Environmental to the Draft SQIDEP (May 2017 - October 2018).

## 11.0 MUSIC Modelling Guidelines

These guidelines provide instruction to the creation and application of a treatment node for the Ecosol™ Storm Pit (Class 2) for the Model for Urban Stormwater Improvement Conceptualisation (MUSIC). The Ecosol™ Storm Pit (Class 2) can be modelled in MUSIC using the Gross Pollutant Trap Treatment node to represent the results derived from independent testing by the University of Adelaide (ENGTEST The school of civil, environmental and mining engineering) and extensive testing from a number of Australian and international papers on the Multi-Barrier filter bed (detailed in section 3.0). The guidelines apply to the creation of the treatment node within MUSIC v6.3 or MUSIC X v1.1

Insert a generic treatment node into your model by selecting “Generic” under the treatment nodes menu. When the node is created the node properties dialog is displayed. There are several changes that need to be made in this dialog.

- Adjust the text in the Location box to read “Ecosol Storm Pit (Class 2)” plus any other relevant information (Class 2, 10L/s etc.).
- Adjust the low flow bypass to reflect any flow (m<sup>3</sup>/sec) diverted away from the unit before treatment (usually zero).
- Adjust the high flow bypass to reflect the treatable flow rate (TFR values are detailed in table 3) (m<sup>3</sup>/sec), eg. 0.011 for a 10L) any higher flows will bypass treatment.

NOTES: Can be used to describe assumptions or location of reduction values for authority approvals.

Adjust the transfer function for each pollutant selecting the pollutant and editing (right click on the output value in the concentration based capture efficiency table), select the pollutant and edit the input and output values on the graph below to reflect the capture efficiencies (CE) of the treatment device. Table 5 provides the input and output values for the Ecosol™ Storm Pit (Class 2)

Pollutant	Removal Rate (%)	Entered Input Value	Entered Output Value
Total Suspended Solids	72	1000	280
Total Phosphorus	50	1000	500
Total Nitrogen	43	1000	570
Gross Pollutants (>200µm)	98	1000	20
Heavy Metals	32	n/a	n/a
Total Petroleum Hydrocarbons	80	n/a	n/a

Table 5 - Ecosol™ Storm Pit (Class 2) – MUSIC node input and output values.



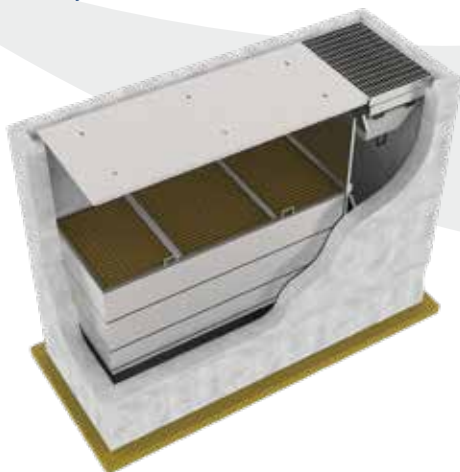


## 12.0 Design Guidelines

To ensure your system is appropriately designed for its intended application and meets local water quality objectives it is essential that the following minimum information is provided:

- Confirm the required treatable flow rate – this is the minimum stormwater run-off volume that must be treated. Typically this is the 1 in 3 month to 1 in 1 year ARI (Refer to section 9.0 for product treatable flow rate data). This is often treated with other Stormwater Treatment Devices, such as Gross Pollutant Traps or Litter Baskets.
- Confirm the proposed location of the unit relevant to other stormwater controls and overall drainage design. It is also important we know the catchment size including percentage of impervious area and hydrology for each proposed Ecosol™ Storm Pit (Class 2) installation.
- Confirm local water quality objectives - Recent state governmental planning policies have established clear stormwater quality bench mark objectives for local and regional councils. Accordingly local and regional council water sensitive urban design objectives have been amended to meet these stormwater pollution reduction targets. It is important we are provided this information specific to your site and local council regulations, this enables us to select the most appropriate Ecosol™ Storm Pit (Class 2) for the site.
- Confirm sediment loads, composition and concentrations of target pollutants generated from the site. This may vary significantly from one site to the next depending on the land use. This data is essential as it allows Urban Asset Solutions Pty Ltd to appropriately size and configure your unit specific to its application. Should this information not be available then typical urban roads mean pollutant concentration levels will be assumed specific to the catchment type and land use.

For further assistance in sizing or specifying a system for your next project please complete the form in Appendix 1 and forward to your local Urban Asset Solutions Pty Ltd representative.



### 13.0 Cleaning and Maintenance

As with all filtration systems, the Ecosol™ Storm Pit (Class 2) should be monitored and cleaned regularly. The cleaning frequency, and the cost, depends heavily on the surrounding environment, the unit's proximity to a waste facility and the quality and quantity of stormwater run-off conveyed to the system.

Urban Asset Solutions Pty Ltd has a very competitive cleaning service. After each clean we provide a report detailing the volume and type of pollutants removed. We believe that it is in your best interests for Urban Asset Solutions Pty Ltd staff to clean and maintain the unit, not only because we are specialists, but also because proper monitoring and maintenance enhances the unit life significantly.

Should you use another company to clean the unit, or undertake this work yourself, we request that it be conducted according to Urban Asset Solutions Pty Ltd specifications. Otherwise, you may invalidate your warranty, as damage caused by inappropriate cleaning procedures is not covered. The advantages of using Urban Asset Solutions Pty Ltd to clean and maintain your unit are that you get:

The advantages of using Urban Asset Solutions Pty Ltd to clean and maintain your unit are that you get:

- regular inspections of your unit;
- a comprehensive cleaning service with removal and disposal of all captured pollutants;
- a detailed report provided on completion of each clean;
- trained and experienced staff; and remedial work completed if required.

Table 6 provides a broad guideline about the number of cleans required annually for each treatment element within the Ecosol™ Storm Pit (Class 2).

Product Code	Pollutant Holding Capacities			Optimal Maintenance Frequency			Optimal Catchment Area
	Gross Pollutants	Sediment	Hydrocarbons	Primary Treatment Chamber	Secondary Treatment Chamber		
	(m <sup>3</sup> )	(m <sup>3</sup> )	(L)	Litter Basket Clean	Detention Bay Clean	Storm Pit Filter Media Exchange	(Ha)
Storm Pit (Class 2) 10L/s	0.182	0.560	828	2	1	1	1.5
Storm Pit (Class 2) 20L/s	0.243	0.870	1,397	2	1	1	1.5
Storm Pit (Class 2) 30L/s	0.304	1.000	2,400	3	1	1	1.8
Storm Pit (Class 2) 40L/s	0.304	1.000	1,620	3	1	1	1.8
Storm Pit (Class 2) 60L/s	0.364	1.575	2,520	3	1	1	2.4
Storm Pit (Class 2) 80L/s	0.425	2.310	3,780	4	1	1	3.0
Storm Pit (Class 2) 110L/s	0.486	3.240	5,184	4	1	1	3.0

Table 6 - Ecosol™ Storm Pit(Class 2) Maintenance Frequencies





## 14.0 Applications and Configurations

The unit can be installed either at-source or in-line on pipes ranging in diameter from 100mm up to 600mm, usually in small commercial and high-density catchments ranging in size up from 1.5 to 3.0Ha. For larger pipe sizes contact your local Urban Asset Solutions Pty Ltd office.

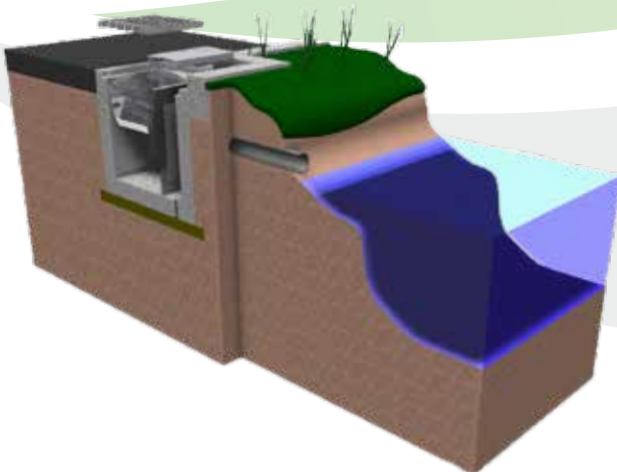
The Ecosol™ Storm Pit (Class 2) is a unique compact at-source or in-line stormwater filtration system designed to carry out multiple treatment processes on stormwater runoff within the one compact underground device. In particular it is designed to remove, at pre-determined treatable flows, particulate, dissolved and in some cases colloiddally bound contaminants.

Typically, the Ecosol™ Storm Pit (Class 2) is designed for trafficable loadings and is located in commercial car parks, high rise residential apartment complexes, hardstand areas in shopping centre car parks and industrial estates.

Typical applications include:

- light industrial estates;
- mining and bulk handling facilities;
- Industrial and commercial sites such as car parks and shopping centres commercial wash down bays such as truck stops and council depots; and
- high density housing estates.

This systems is often a preferred choice in developments where site space constraints prohibits the installation of multiple treatment measures. It also provides an efficient solution for pre-screening of stormwater run-off prior to on site detention or rain water harvesting systems.



## 15.0 Turnkey Services

Urban Asset Solutions Pty Ltd design and estimating staff provide a dedicated management approach towards your project. In addition all staff are capable of liaising with the client, the consulting engineer, the contractor and all other interested third parties to achieve a successful outcome.

Urban Asset Solutions Pty Ltd provides a complete turnkey service from design, manufacture and installation to cleaning and maintenance for its product range and prides itself on providing its client with a cost effective, efficient service.

## 16.0 Accreditation

Urban Asset Solutions Pty Ltd is accredited to AS/NZS ISO 14001 (Environment) and AS/NZS 9001 (Quality). Our commitment to continuously improving our products and services is demonstrated by our ongoing accreditation for Quality and Environmental Management. Urban Asset Solutions Pty Ltd is also committed to a safe environment for its employees. We are fully third-party accredited to AS/NZS 45001.

## 17.0 Supplier and Technical Product Contact Details

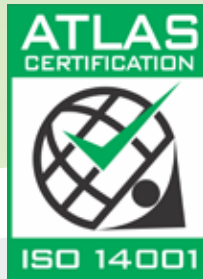
For any maintenance or technical product enquiries please contact:

Urban Asset Solutions Pty Ltd

Tel: 1300 706 624

Fax: 1300 706 634

Email: [info@urbanassetsolutions.com.au](mailto:info@urbanassetsolutions.com.au)



## Appendix 1

### Ecosol™ Storm Pit (Class 2) Essential Information Form

To ensure your system is appropriately designed for its intended application and meets local water quality objectives it is essential that the following minimum information is provided:

#### Customer Details

Contact Person:

Company Name:

Phone:

Fax:

Email:

#### Project and Site Information

Project Name:

Project Address:

Type of Development/Catchment Type:

Catchment area (ha):

Impervious area fraction (%):

Pollutant Removal Targets (%):

Site Water Quality Objectives (WQO's)

Gross Pollutants (>2000µm)

Total Suspended Solids (20 – 2000µm)

Total Phosphorus

Total Nitrogen

Heavy Metals

Total Petroleum/ Hydrocarbon

Other

Local Authority:

Device Location:

Designed Discharge (Peak ARI Flow Rate) L/s:

Treatable Flow Rate (L/s):

Designed Discharge (Peak ARI Flow Rate) L/s:

Other essential design or site relevant information:

Please forward the above information for your next project to your local Urban Asset Solutions Pty Ltd representative. On receipt Urban Asset Solutions Pty Ltd will model and design the most appropriately sized system to suit your application to assist you achieve the project Water Sensitive Urban design objectives.

Email: [info@urbanassetsolutions.com.au](mailto:info@urbanassetsolutions.com.au)

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