

## Floatables Management Study Floatables Control Technologies

### INLET DEVICES

Name of Device:	Curb Inlet Basket, Suntree Technologies Inc. <a href="http://www.suntreetech.com">www.suntreetech.com</a> happel@suntreetech.com	
Brief Description:	<ul style="list-style-type: none"> <li>-storm water enters the curb inlet and it is funneled by an adjustable throat to a weir where sediment deposits</li> <li>-water flows over the weir and into the removable basket, filtering trash, leaves, yard clippings, sediment, etc.</li> <li>-in order to collect oil and grease, a hydrocarbon absorption boom can be placed along the incoming edge of the basket</li> </ul>	
Cost: \$\$\$	<ul style="list-style-type: none"> <li>-curb inlet basket \$695.00</li> <li>-extra capacity curb inlet basket \$795.00</li> </ul>	
Maintenance:	<ul style="list-style-type: none"> <li>-easily cleaned without entering the manhole and avoids having to deal with <i>Safe Entry Laws</i></li> <li>-remove lid, reach in with a manhole hook to retrieve the basket, empty the contents, and replace the basket</li> <li>-one man and a small truck can service up to 80 in one day</li> </ul>	
Applications:	-5 units are installed in Lakeland, FL; one unit collected a total of 50.7 pounds of debris (40.1 lbs was foliage and 10.2 lbs was sediment)	
Picture:		

Name of Device:	Curb Inlet Protector, Suntree Technologies Inc. <a href="http://www.suntreetech.com">www.suntreetech.com</a> happel@suntreetech.com	
Brief Description:	<ul style="list-style-type: none"> <li>-prevents trash, grass clippings, and sediment from entering curb inlet, has a small sediment filter and upper bypass overflow holes above it to prevent flooding</li> <li>-semi-flexible body installs easily on curved curb inlets</li> <li>-it is street sweeper safe</li> <li>-the lower filter screen is a very fine 40 sieve size, yet has a flow rating of 145 gal/min/ft<sup>2</sup></li> <li>-for fitting any unusual shaped inlets, use a squeegee mold to compress and mold to the shape of any irregularities in the concrete</li> </ul>	
Cost: \$\$	<ul style="list-style-type: none"> <li>-prices range from \$348 to \$648 for the entire kit</li> <li>-individual pieces can be purchased separately</li> <li>-custom sizes are available – call for a quote</li> </ul>	
Maintenance:	-very little maintenance required	
Picture:		

Name of Device:	Ultra-CurbGuard, UltraTech International, Inc. <a href="http://www.Stormwater-Products.com">www.Stormwater-Products.com</a> <a href="mailto:info@Stormwater-Products.com">info@Stormwater-Products.com</a>
Brief Description:	<ul style="list-style-type: none"> <li>-keeps floatables, oil, and sediment out of curb inlets</li> <li>-uses two heavy-duty tension rods to keep it secured inside the inlet.</li> <li>-for use with curb openings without street grates</li> </ul>
Cost: \$	-cost ranges from \$119 to \$173 depending on the size
Maintenance:	-filtering material is quickly and easily replaced
Picture:	

Name of Device:	Ultra-CurbGuard, Fixed Model or Insert style, UltraTech International, Inc. <a href="http://www.Stormwater-Products.com">www.Stormwater-Products.com</a> <a href="mailto:info@Stormwater-Products.com">info@Stormwater-Products.com</a>
Brief Description:	<ul style="list-style-type: none"> <li>-Fixed Model -the only permanently installed curb inlet product with hidden protection</li> <li>-steel framework mounts in drain permanently</li> <li>-mounts flush with curb inlet – allows unobstructed access to street sweepers and other traffic</li> <li>-Insert Style – keeps oil, sediment, floatables and other contaminants out of curb inlets</li> <li>-for use in drains with curb inlets only</li> <li>-2 heavy-duty tension rods keep unit secured inside inlet for a clean, flush-mounted installation</li> </ul>
Cost: \$ up to \$\$\$	<ul style="list-style-type: none"> <li>-Fixed Model - cost is per foot - \$284/ft</li> <li>-Insert Style – for a 22” – 36” curb opening it costs \$94 and a 35”-60” opening it costs \$99</li> </ul>
Maintenance:	<ul style="list-style-type: none"> <li>-Fixed Model - easy to clean and maintain – simply slide unit out on its installed runners, remove contaminants, replace components if necessary and slide back into place</li> <li>-only oil absorbent pillow (in Oil &amp; Sediment Models) needs to be replaced periodically when saturated</li> <li>-Insert Style – filtering material is quickly and easily replaced</li> </ul>
Picture:	

<b>Name of Device:</b>	<b>Ultra DrainGuard, Curb Insert Style, UltraTech International, Inc.</b> <a href="http://www.Stormwater-Products.com">www.Stormwater-Products.com</a> info@Stormwater-Products.com
<b>Brief Description:</b>	-catch basin insert designed to stop silt, sediment, and other debris from entering curb inlets and catch basins -for use with combination catch basins with a street grate and curb opening -a heavy duty tension rod secures it inside the curb inlet -fits grate sizes up to 40" x 40" and curb inlets up to 60" wide -will allow 770 gpm of stormwater flow through its Bypass Ports. DrainGuards with larger flow rates may be manufactured when needed.
<b>Cost: \$</b>	-the cost ranges from \$86 to \$112
<b>Maintenance:</b>	-Inspections and replacement can frequently be extended to a six-month or annual basis -field studies have shown that monthly maintenance is normally not needed after the initial observation period.
<b>Picture:</b>	NO PICTURE AVAILABLE

<b>Name of Device:</b>	<b>The Flo-Gard Supplemental Insert, KriStar Enterprises, Inc.</b> <a href="http://www.kristar.com">www.kristar.com</a> customercare@kristar.com
<b>Brief Description:</b>	-a removable, flexible body device designed for curb opening inlets without grate or trench drain installations -use near hard surfaced vehicle parking lots with curb opening inlets or areas served by trench drains
<b>Cost: \$\$</b>	-prices are job specific -a 2 ft section is \$350 and a 4 ft section is about \$625
<b>Maintenance:</b>	-must be cleaned out on a recurring basis -recommends at least 3 times per year, more in high exposure areas
<b>Picture:</b>	

## INLET DEVICES CONTINUED

### Grate Inlet and Catch Basin Drop-In Inserts

Name of Device:	<b>Grate Inlet Skimmer Box, Suntree Technologies</b> <a href="http://www.suntreetech.com">www.suntreetech.com</a> <a href="mailto:happel@suntreetech.com">happel@suntreetech.com</a>
Brief Description:	<ul style="list-style-type: none"> <li>-a multi-stage filtration device that captures everything from hydrocarbons, to sediments, to grass clippings, and human trash</li> <li>-made of durable fiberglass, with stainless steel filter screens backed by heavy duty aluminum grating</li> <li>-custom shaped units are available</li> </ul>
Effectiveness:	<ul style="list-style-type: none"> <li>-a deflection shield keeps the majority of the water turbulence adjacent to the small sieve size filters preventing the escape of tiny particles</li> <li>-skimmer tray prevents floatables from escaping through the overflow trays</li> <li>-completely drains of all water after storm events also allowing collected solids to dry as well</li> </ul>
Cost: \$\$\$	-ranges from \$695 to \$995
Maintenance:	<ul style="list-style-type: none"> <li>-installation is quick and simple, just remove the grate, insert the device and then replace the grate</li> <li>-easy to clean, just remove the skimmer tray and deflection shield that are attached and turn over the filter box and empty for disposal</li> </ul>
Applications:	<ul style="list-style-type: none"> <li>-used in Melbourne Beach, Florida in a storm water project to protect Gemini Elementary School property and roadway at a nearby church</li> <li>-18 units are in Cocoa Beach, FL and for example in April 2000 were serviced in 6.5 hours and a total weight of 1115.9 pounds of debris was collected in this time frame</li> <li>-8 units used in Lakeland, FL</li> </ul>
Picture:	

Name of Device:	<b>Ultra-DrainGuard (Trash &amp; Debris Model), UltraTech International, Inc.</b> <a href="http://www.Stormwater-Products.com">www.Stormwater-Products.com</a> <a href="mailto:info@Stormwater-Products.com">info@Stormwater-Products.com</a>
Brief Description:	<ul style="list-style-type: none"> <li>-device positioned just underneath the grate inlet and is designed to specifically catch larger items such as cigarette butts, candy wrappers and paper goods</li> <li>-made with heavy duty polypropylene geotextile material, also available with 100% recycled X-TEX material</li> </ul>
Effectiveness:	-it collects sediment and oil as well as debris
Cost: \$	-ranges from \$55 for a 1 pack to \$522 for a 10 pak
Maintenance:	- easy to maintain, just lift the grate cover and replace
Picture:	

**Other Important Information:**

Ultra-DrainGuard Retainers are available to use on an inlet without a grate. They are heavy duty steel retainers that mount on the inside ledge of the catch basin, securing the DrainGuard when grating is removed or installed.

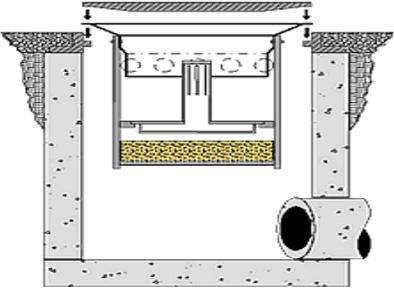
The price is \$30 for a set of 2.

-There is also an Ultra-GrateGuard that is a cover over grates to allow runoff to flow through while blocking sediment and /or capturing oil.

<b>Name of Device:</b>	Hydro-Kleen™, Hydro Compliance Management, Inc. <a href="http://www.HydroCompliance.com">www.HydroCompliance.com</a> HCM@HYDROCOMPLIANCE.COM
<b>Brief Description:</b>	-drop-in unit underneath the grate cover and is a multi-media filtration design combined with pre-settling sedimentation containment and overflow bypass protection -water flow is directed into the pre-settling sedimentation chamber that collects heavy sediments and debris and then into the filtration chamber -designed mostly for filtering hydrocarbons, organically bound metals, and sediments however will collect small debris such as organic materials from wet weather and industrial runoff and candy wrappers and cigarette butts by placing a screen in the device(note: a company representative stated that most of their customers don't use screens due to the fact that their product is geared more towards collecting hydrocarbons. In addition, screening may clog the system) -can fit a circular or square catch basin grate
<b>Effectiveness:</b>	-filtration chamber is designed to handle 40-50 gpm through the media chamber, effectively treating up to 1/2" of rain per hour
<b>Cost: \$\$\$\$</b>	-price for a typical catch basin insert ranges from \$1,500 to \$2,500 -larger sizes up to 33" x 48" will cost \$3,925 and anything above that will require custom fitting as well as a smaller unit from 0" to 12"
<b>Maintenance:</b>	-must be maintained on a regular schedule to prevent saturation of the filter media by contaminants and blockage from sedimentation and debris buildup -maintenance can be accomplished in minutes by vacuuming sediment loadings from the sedimentation chamber and replacing the filters -recommend that filters be changed every 4 to 6 months
<b>Applications:</b>	-American Airlines, Alcoa, Federal Express, Ford Motor Company, General Motors, Kroger, Seven Eleven, US Army are a few examples of current applications
<b>Picture:</b>	

<b>Name of Device:</b>	<b>The Hydro-Cartridge®, Advanced Aquatic International, Inc.</b> <a href="http://www.hydro-cartridge.com">www.hydro-cartridge.com</a> AdvAquaticProds@webtv.net
<b>Brief Description:</b>	-a fiberglass device for inlet retrofitting that is designed to remove phase-separated petroleum hydrocarbons, sediments and floatable pollutants -a petroleum hydrocarbon absorbent filter is located at the inlet on the surface of the water -also designed with a holding capacity to prevent small flows of hazardous fluids from reaching the drain structure
<b>Effectiveness:</b>	-has an estimated 20 year design life & comes with a 5 year warranty from the manufacturer -flow rates from 360 gpm to 3,514.3 gpm are obtainable
<b>Cost: \$\$\$</b>	-ranges from \$749 to \$1899 -hydrocarbon absorbent filter ranges from \$12.25 - \$49(needs to be replaced once per year)
<b>Maintenance:</b>	-if its not maintained properly (i.e. maximum holding capacity is reached) it will self flush to prevent ponding -easily installed and maintained by existing personnel and will fit the majority of existing types of drain inlet designs
<b>Applications:</b>	-used in Coral Gables, Hialeah, Miami Springs, Fort Lauderdale, and Pompano Beach, Florida since 1993 and numerous other cities and private businesses with great success
<b>Picture:</b>	

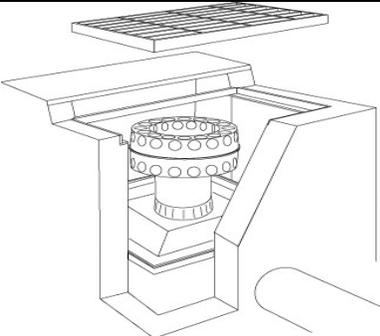
<b>Name of Device:</b>	<b>Streamguard™ Catch Basin Insert (Model 3002), Bowhead Manufacturing Co.</b> <a href="http://www.bmccatalog.com">www.bmccatalog.com</a> (800)909-3677
<b>Brief Description:</b>	-this model was designed specifically to remove trash and debris from storm water -the insert's universal skirt adapter allows it to be installed in minutes in any size catch basin up to 30" by 40" -storm water enters the catch basin and is directed into the insert's screen bag designed to trap cigarette butts, candy wrappers, bottle caps, etc. -has an emergency overflow for high-flow storm events and may be emptied and reused
<b>Effectiveness:</b>	-total flow rate capacity is 500 gpm -effective in demonstrating their ability to eliminate the discharge of trash from storm sewers
<b>Cost: \$</b>	-for 1-4 units it is \$64 -for 5-9 units it is \$62 - for 10+ units it is \$56
<b>Maintenance:</b>	-where moderate levels of trash occur, weekly or monthly maintenance may be required -maintenance consists of removing the unit, emptying the accumulated trash, and replacing it -at heavily littered sites it may be required to inspect inserts after each significant storm event but inserts are typically replaced annually
<b>Applications:</b>	-inserts are in use at over 70 industrial, municipal and military sites in US, Canada, & France -a few east coast examples include: New Hampshire DOT, Anchor Glass in Pennsylvania, US Coast Guard in Chesapeake, VA, and City of Miami Springs in Florida
<b>Picture:</b>	

<b>Name of Device:</b>	<b>Aqua-Guard™ Catch Basin Insert, Aquashield, Inc.</b> <a href="http://www.aquashieldinc.com">www.aquashieldinc.com</a> remsol@cdc.net	
<b>Brief Description:</b>	<ul style="list-style-type: none"> <li>-removes coarse sediment, trash/debris, and pollutants such as dissolved oil and metals</li> <li>-includes a sediment collection area and filter media contained in easy to remove bags</li> <li>-available in variety of sizes and models and custom designed to fit most catch basins</li> </ul>	
<b>Effectiveness:</b>	<ul style="list-style-type: none"> <li>-3<sup>rd</sup> party testing has demonstrated effective removal</li> <li>-been certified by California EPA's Environmental Technology Certification Program for the removal of 90%-95% of dissolved petroleum and oils</li> </ul>	
<b>Cost: NA</b>	-each system is custom engineered for site specific needs, and manufactured to match the customer's specifications with selected high quality materials, thus a price is not published	
<b>Maintenance:</b>	<ul style="list-style-type: none"> <li>-it is lightweight and can be maintained without the need for special lifting equipment</li> <li>-inspection is typically scheduled quarterly, with maintenance being performed as needed</li> <li>-simple vacuuming of accumulated sediment and debris is followed by easy inspection/replacement of the filter media</li> </ul>	
<b>Applications:</b>	-a few typical applications include: retail/commercial, industrial facilities, highway/transportation facilities, government facilities, and fast food restaurants	
<b>Picture:</b>		

<b>Name of Device:</b>	<b>DrainPac™, Pac Tech, Inc.</b> <a href="http://www.drainpac.com">www.drainpac.com</a> drainpacinfo@drainpac.com	
<b>Brief Description:</b>	<ul style="list-style-type: none"> <li>-a flexible storm drain catchment and filtration liner designed to filter pollutants, debris, and solids prior to discharge into storm drain</li> <li>-available in four styles: Grate Top, Curb, and round configurations as well as new styles designed for outfall, or "end of pipe" applications, and drop-in drain applications. Each insert is equipped with a choice of two overflow systems, the hydraulic bypass and the new uninhibited bypass, both of which accommodate heavy rains and potential flooding.</li> <li>-examine current storm water designs in order to locate the areas where the DrainPac will have the most impact, evaluate the contents of the influent storm water, select a filter inlet media from our choice of six options</li> </ul>	
<b>Effectiveness:</b>	<ul style="list-style-type: none"> <li>-can handle a flow rate of up to 50 gpm/sq.ft. and hold up to 150 pounds of material</li> <li>-collects 97 to 98 percent of the sediment in the water</li> </ul>	
<b>Cost: NA</b>	-	
<b>Maintenance:</b>	-inspections should take place prior to installation to determine areas of effectiveness. After installation, inspections are needed in order to establish maintenance schedules.	
<b>Applications:</b>	<ul style="list-style-type: none"> <li>-streets, commercial parking lots, shopping centers, maintenance and fueling facilities and construction sites</li> <li>-has already been implemented in Texas, California, Alabama, Florida, Missouri, N.Carolina, Arkansas, Tennessee, Michigan, Georgia, Mississippi, Massachusetts and Washington</li> <li>-Tahoe Keys Property Owners Association, with the help of South Lake Tahoe and guidance of the Lahontan Regional Water Quality Control Board, became the first institution to install it</li> <li>-Caltrans installed 50 along Highway 50 between Trout Creek and Stateline</li> </ul>	
<b>Picture:</b>		

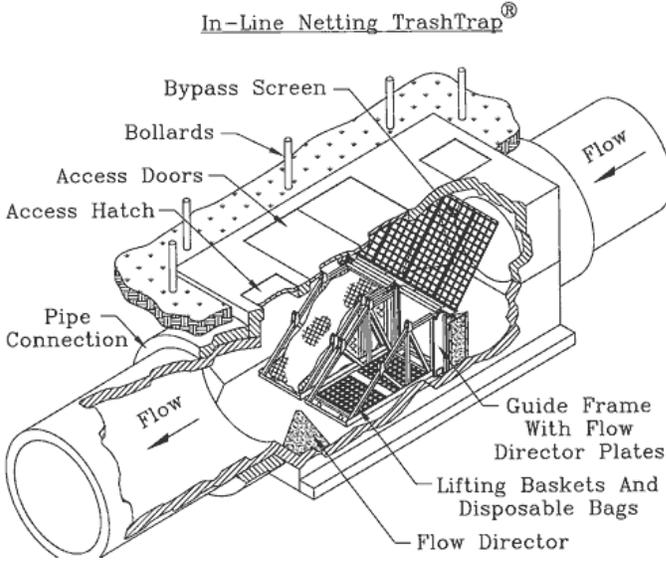
<b>Name of Device:</b>	Ultra-Urban Filter with OARS® OnBoard, AbTech Industries (Several model types including the Ultra Urban Filter Series CO1414 are available for use in curb opening inlet stormdrains) <a href="http://www.abtechindustries.com">www.abtechindustries.com</a> <a href="mailto:info@abtechindustries.com">info@abtechindustries.com</a>
<b>Brief Description:</b>	-captures oil, grease, trash, and sediment -trash and sediment accumulate in the internal basket while oil is captured in the filter media -will suspend from the drain into the catch basin through a structural plastic mounting collar and funnel mechanism
<b>Effectiveness:</b>	-field tests have proven that the OARS SmartSponge media will remove up to 80% of oil and grease -flow rates through the filters are greater than 110 gpm (for the D12020 series)
<b>Cost: \$</b>	-the D12020 model costs \$200 (20" x 20 x 20.75" )
<b>Maintenance:</b>	-the installation time of the DI2020 is less than 5 minutes -should not be installed in drains where modules obstruct the drain pipe outlet and the size of the drain should allow room for overflow -should be serviced as needed, usage of a vacuum truck
<b>Applications:</b>	-a few locations of installations include: City of Santa Monica, LMU in California, Los Angeles, Santa Barbara, Beverly Hills, Springfield, Massachusettes and El Paso, Texas
<b>Picture:</b>	

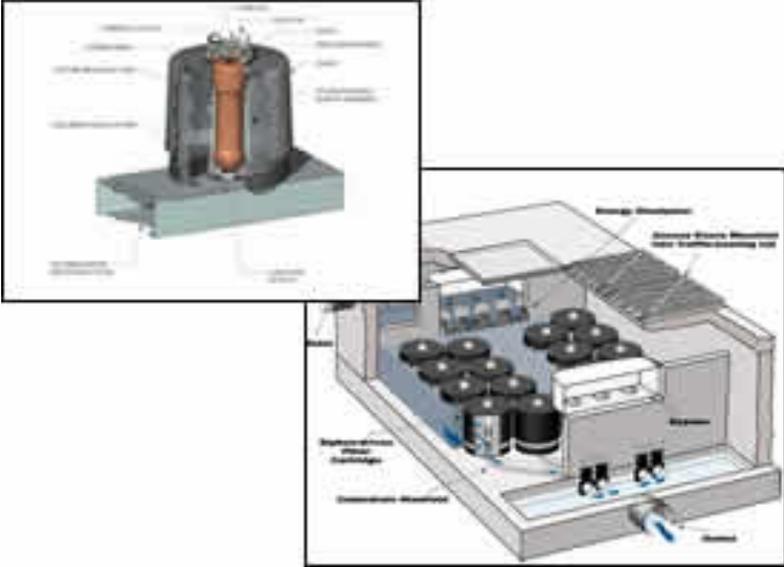
<b>Name of Device:</b>	FloGard+Plus, KriStar Enterprises, Inc. <a href="http://www.kristar.com">www.kristar.com</a> <a href="mailto:customercare@kristar.com">customercare@kristar.com</a>
<b>Brief Description:</b>	-a multipurpose catch basin insert designed to capture sediment, debris, trash & oils/grease -a high-flow bypass allows flows to bypass the device while retaining the pollutants
<b>Effectiveness:</b>	-according to tests done by UCLA the device is effective in collecting litter and debris -oil and grease removal efficiency ranged from 70 to 80% for most conditions. -sand removal was nearly 100% for particles 30 mesh (589 to 833 μm) and larger, 20% for particles 60 mesh (250 to 420 mm) and nearly zero for smaller particles
<b>Cost: \$\$</b>	-12" x 12" is about \$465 -3' x 4' is about \$1420
<b>Maintenance:</b>	-manufacturer recommends no less than 3 inspections per year, more in high exposure areas -remove device from inlet and dump contents into a DOT approved drum for disposal -cleaned with a vacuum truck
<b>Applications:</b>	-for areas with low to higher than normal sediment, trash, and moderately high levels of petroleum hydrocarbons such as parking lots as well as public and private streets
<b>Picture:</b>	

<b>Name of Device:</b>	<b>PerkFilter™ Percolation Filter, KriStar Enterprises, Inc.</b> <a href="http://www.kristar.com">www.kristar.com</a> <a href="mailto:customercare@kristar.com">customercare@kristar.com</a>
<b>Brief Description:</b>	<ul style="list-style-type: none"> <li>-The Perk (percolation) insert easily and economically converts any catch basin into a detention basin for the collection of solids, silt and debris from storm water runoff and other sources</li> <li>-the Perk Filter™ creates a sump or detention area above the inlet and outlet pipes, away from any turbulence that might scour out collected silt and debris.</li> <li>-as water flows into the catch basin, solids settle out and are collected in the detention area (sump) while oils and greases are filtered through the installed hydrocarbon filter medium.</li> <li>-high storm water flows in excess of the filter's capability are directed through the incorporated "high flow" bypass.</li> <li>-allows for water to continuously percolate into the drainage system eliminating standing water thereby reducing maintenance problems and related expenses.</li> </ul>
<b>Effectiveness:</b>	-new patent, dated June 5, 2001
<b>Cost: \$\$\$</b>	-\$950-\$1360
<b>Maintenance:</b>	-Two system inspections, one filter cleaning and one change and disposal of filter medium
<b>Applications:</b>	-recommended for areas with high silt, sediment and debris loading and moderately high levels of petroleum hydrocarbons.
<b>Picture:</b>	

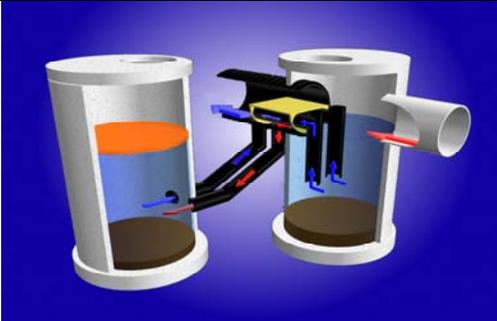
<b>Name of Device:</b>	<b>The SNOOT™ Oil-Water-Debris Separator, Best Management Products, Inc.</b> <a href="http://www.bestmp.com">www.bestmp.com</a> <a href="mailto:tjm@bestmp.com">tjm@bestmp.com</a>
<b>Brief Description:</b>	<ul style="list-style-type: none"> <li>-a hooded outlet cover that attaches to the catch basin wall and contains floatables and oil within the catch basin or structure</li> <li>-built from a light, yet very strong plastic composite, making it easier to install and impervious to ice-melting chemicals</li> <li>-flow restrictors, odor control filters, energy flow diffusers, and oil absorbents are available</li> </ul>
<b>Effectiveness:</b>	-stops up to 80% free oils, 95% floatables, and 50 % suspended solids
<b>Cost: \$</b>	<ul style="list-style-type: none"> <li>-the 12" SNOOT + installation kit is \$200</li> <li>-the 12"SNOOT + flow restrictor and installation kit is \$315</li> <li>-sizes go up to a 96" 2 part SNOOT with a 16 bolt installation kit for \$3895</li> </ul>
<b>Maintenance:</b>	<ul style="list-style-type: none"> <li>-a removable water tight clean-out port is standard for easy access to pipe</li> <li>-most units can be installed in under one hour</li> </ul>
<b>Applications:</b>	<ul style="list-style-type: none"> <li>-more than 2,000 have been installed</li> <li>-some sites include: Salt Lake City, UT – Boston, MA – Indianapolis, IN – Savannah, GA – Blaine, MN – Buffalo, NY – Naples,FL – Ontario, Canada</li> </ul>
<b>Picture:</b>	

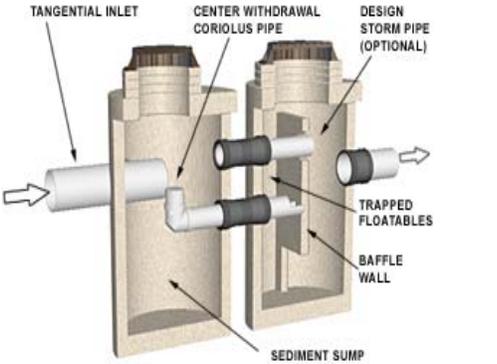
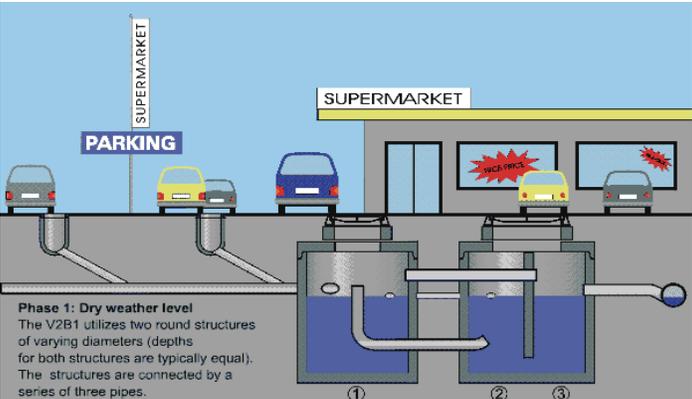
## IN-LINE DEVICES

Name of Device:	The In-Line Netting TrashTrap™, Fresh Creek Technologies, Inc. <a href="http://www.freshcreek.com">www.freshcreek.com</a> fresh@freshcreek.com
Brief Description:	-a modular concrete chamber containing the apparatus for holding the disposable bags -installed in-line between the regulator and the outfall -are underground and out of sight, particularly well suited for densely populated areas
Effectiveness:	-high capture efficiencies of over 90% (documented in EPA sponsored studies) -can be used for flows as low as 4 cfs to over 4,000 cfs.
Cost: \$\$\$	-costs are site specific -capital costs not including installation range from \$1,000 per cfs in large systems to over \$2,000 in smaller systems
Maintenance:	-nets are serviced by a boom truck and by replacing the nets and transporting used ones to a landfill -time between net change outs is determined by the frequency of wet weather and the amount of trash in the flow -change outs are routinely accomplished in under 30 minutes -net inspections may be required after intense storms to check for damage -installation time is between one and five days
Applications:	-Case Study: North Bergen, NJ – the MUA used 9 Netting TrashTrap® systems(3 end of pipe, 4 in-line, and 2 floating systems), over a period of 36 months a total of 90 tons of floatables was captured and an average weight of a single net was 638 pounds, the heaviest net weighed over 5,000 pounds -used in New York
Picture:	 <p>The diagram, titled "In-Line Netting TrashTrap®", shows a cross-section of the device. It features a "Pipe Connection" on the left with "Flow" indicated by an arrow. Inside the chamber, there is a "Bypass Screen" at the top, "Bollards" for structural support, and "Access Doors" and "Access Hatch" for maintenance. A "Flow Director" is positioned at the bottom, leading to a "Guide Frame With Flow Director Plates". Below this frame are "Lifting Baskets And Disposable Bags".</p> <p>Two photographs are included: one showing the exterior of the concrete chamber with a circular access hatch in a grassy area, and another showing the interior of the chamber filled with captured trash and debris.</p>

Name of Device:	<p>The StormScreen™, Stormwater Management, Inc.  <a href="http://www.stormwaterinc.com">www.stormwaterinc.com</a>  <a href="mailto:info@stormwaterinc.com">info@stormwaterinc.com</a></p>
Brief Description:	<ul style="list-style-type: none"> <li>-The StormScreen system is a structural BMP that removes trash and debris and larger suspended solids at high flow rates by combining direct screening with many of the hydraulic aspects of the patented StormFilter siphonic, radial flow, cartridge system</li> <li>-this system provides treatment by direct screening through the StormScreen cartridges and by settling within the concrete vault</li> <li>-the standard cartridge screen has a pore opening of 2.4mm that ensures the capture of all solids of greater size, settling provides some removal of particles smaller than 2.4mm</li> <li>-the StormScreen wraps around the cartridges and there are about 20 cartridges in a 8' x 16' vault which are suspended off the floor of the vault to avoid decomposition</li> <li>-captured solids are collected in a large sump area on the floor of the vault below the elevated cartridges and it is equipped with a dewatering mechanism to provide ease with maintenance and vector control</li> <li>-it is a fairly new product and it is critical before you begin the design process, to determine if the StormScreen is an approved BMP with your local governing agency</li> </ul>
Effectiveness:	<ul style="list-style-type: none"> <li>-100% removal of objects if they are greater than 2mm</li> <li>-each StormScreen cartridge is designed to treat a peak flow rate of 0.5 cfs (225 gpm)</li> </ul>
Cost: \$\$\$\$\$\$	<ul style="list-style-type: none"> <li>-for a flow rate of 5 cfs it will cost approximately \$30,000 in a 8' x 16' concrete vault</li> <li>-for a flow rate of 10 cfs it will cost approximately \$40,000 in a 8' x 16' vault</li> <li>-for a flow rate of 20 cfs it will cost approximately \$80,000 b/c you would need two 8' x 16' vaults</li> </ul>
Maintenance:	<ul style="list-style-type: none"> <li>-1<sup>st</sup> year inspection is recommended every other month for the first 6 months, then maintained annually</li> <li>-open vault door, use net or grapple to get large floating material then use a vacuum truck</li> </ul>
Applications:	<ul style="list-style-type: none"> <li>-can be installed into small, prefabricated catch basins or incorporated into large, cast-in-place facilities that treat hundreds of cubic feet per second</li> <li>-1<sup>st</sup> installed in Griffin, GA as a pilot study and currently installing one in California</li> <li>-has only been available for about a year</li> </ul>
Picture:	

Name of Device:	Nutrient Separating Baffle Box, Suntree Technologies, Inc. <a href="http://www.suntreetech.com">www.suntreetech.com</a> <a href="mailto:happel@suntreetech.com">happel@suntreetech.com</a>
Brief Description:	<ul style="list-style-type: none"> <li>-removes sediment, foliage, and litter from storm water</li> <li>-available in fiberglass or concrete</li> <li>-3 baffled chambers</li> <li>-it has screens elevated above the baffles therefore preventing nutrient loss from the foliage and allowing unobstructed flow over the baffles</li> </ul>
Effectiveness:	-removes up to 90% TSS
Cost: \$\$\$\$\$	<ul style="list-style-type: none"> <li>-fiberglass model(12' x 7' x 5') costs \$17,500</li> <li>-concrete model(12' x 7' x 5') costs \$16,800      a concrete model (8' x 4' x 7') costs \$12,500</li> </ul>
Maintenance:	<ul style="list-style-type: none"> <li>-no heavy equipment required for installation</li> <li>-screens are hinged and can swing out of the way to give access to a vacuum truck</li> <li>-to prevent water flow into the baffle box during cleaning, a damper is built into each end</li> <li>-during servicing, the captured foliage and litter is removed by a vacuum truck</li> </ul>
Applications:	-an experiment was done with a conventional baffle box and the Nutrient Separating Baffle Box and the water used in the experiment was saturated with Red Georgia Clay. The Nutrient Separating Baffle removed far more of the suspended particles than the conventional one. At a slow flow rate, and when combined with a flow deflector it removed 99.9% of the clay
Picture:	

Name of Device:	BaySaver Separation System, BaySaver Inc. <a href="http://www.baysaver.com">www.baysaver.com</a> Info@BaySaver.com
Brief Description:	-removes sediment, oils, and floating debris -comprised of 2 precast concrete manholes and a high-density polyethylene (which is lightweight and durable)separator unit -coarse sediments removed in 1st settling chamber and finer sediments and floatables removed and trapped in the second -the dual settling chambers and internal flow splitter act in tandem to provide different levels of treatment for different runoff intensities
Effectiveness:	-can treat flow rates up to 11 cfs -studies are currently under way to determine the removal efficiency
Cost: \$\$\$\$\$	-a 1 K system costs \$8890 -a 3 K system costs \$13,890 -a 5 K system costs \$18,290 all systems include installation cost
Maintenance:	-most easily installed at same time as the storm drain but can be retrofitted for existing pipe -inspections and maintenance are done above ground,maintenance requires a vacuum truck -designed so that there is removal of only a fraction of stored water, reducing disposal costs
Applications:	-1st system installed in Lake Tahoe Basin at Sierra Pacific Power Co.'s maintenance yard -few applications include high traffic parking lots, gas stations, industrial maintenance facilities, and also used for highway storm water runoff
Picture:	

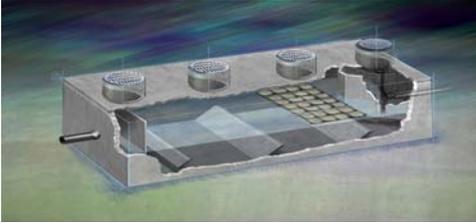
Name of Device:	V2B1™ Stormwater Treatment System, Environment 21, LLC <a href="http://www.env21.com">www.env21.com</a> envengr@env21.com
Brief Description:	-uses swirl sedimentation technology -storm water enters through a tangential inlet pipe which provides optimum swirl distribution in the sediment removal chamber and then enters a second chamber where floating debris are trapped by a baffle wall
Effectiveness:	-sediment removal efficiencies at STF is 75%-85%
Cost: NA	-contact Environment 21 (585)762-8314
Maintenance:	-annual pump out is recommended until operating experience justifies a longer pumping interval -V2B1™ sediment storage capacity is adequate for several years of service
Applications:	-systems have been installed throughout the eastern and central U.S. for private, municipal, and State projects
Picture:	  <p><b>Phase 1: Dry weather level</b> The V2B1 utilizes two round structures of varying diameters (depths for both structures are typically equal). The structures are connected by a series of three pipes.</p>

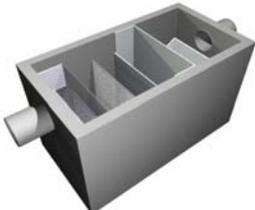
<b>Name of Device:</b>	<b>Aqua-Swirl™ Concentrator, Aquashield, Inc.</b> <a href="http://www.aquashieldinc.com">www.aquashieldinc.com</a> remsol@cdc.net
<b>Brief Description:</b>	-a hydrodynamic separator that uses swirl technology to remove TSS,oil, and debris -made with high density polyethylene (lightweight and durable) -storm water enters the system by a tangential inlet pipe creating a circular flow causing sediment to drop out in the middle and the water exits the system behind a baffle
<b>Effectiveness:</b>	-designed to remove 80% of TSS on an annual basis -around 90%-95% of a typical site's annual runoff volume will be treated by this system
<b>Cost: NA</b>	-each system is custom engineered for each site; email Aquashield or call (888)344-9044
<b>Maintenance:</b>	-chamber can be inspected and maintained from the surface -a vactor truck is used to remove the sediment and debris through the 28" service access
<b>Applications:</b>	-some typical applications include: retail developments, industrial facilities, fast food restaurants, coastal communities, convenience stores, government facilities Examples include: Industrial facility parking lot in Olanca,CA, a storage yard in Charlotte,NC, a Fueling Station in Knoxville,TN, a shopping center parking lot in Honolulu, HI
<b>Picture:</b>	

<b>Name of Device:</b>	<b>Vortechs™ Stormwater Treatment System, Vortech, Inc.</b> <a href="http://www.vortech.com">www.vortech.com</a> dmailhot@vortech.com
<b>Brief Description:</b>	-removes and retains sand, hydrocarbon-laden sediments, metals, oil, and debris -a tangential inlet pipe channels water to a circular grit chamber where sediment is directed toward the center and dropped out to settle and then the oil and grease are trapped by a sealed oil barrier -flow controls cause the inlet to become submerged preventing influent from disturbing already captured contaminants
<b>Effectiveness:</b>	-TSS removal rates of 80% -treats a flow rate of 1.6 cfs to 25 cfs depending on the model size
<b>Cost: \$\$\$\$</b>	-costs begin at about \$1500 per cfs , sizing and pricing is done on an individual basis to accommodate local site conditions and treatment requirements, contact Vortech for help
<b>Maintenance:</b>	-install system in only a few hours -recommended seasonal inspections during the 1 <sup>st</sup> year -typically the system is cleaned once per year depending on weather and site activity(using a vacuum truck)
<b>Applications:</b>	-a few current installations include: TF Green Airport in Warwick, RI, Naval Training Center in Newport,RI, Boeing Commercial Airplane's manufacturing facility in Kansas, and numerous Connecticut DOT highway projects, and a Walgreens in Warwick,RI -City of South Lake Tahoe has a unit as a part of their Beecher/Lodi Erosion Control Project
<b>Picture:</b>	

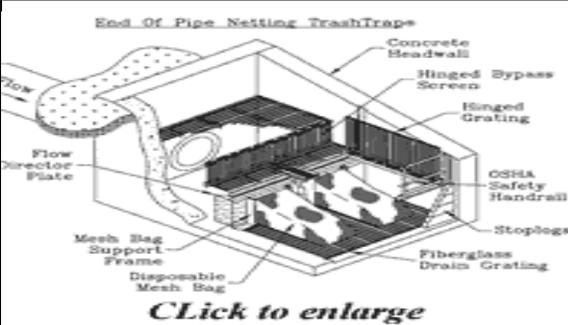
Name of Device:	Downstream Defender™, H.I.L. Technology, Inc. <a href="http://www.hil-tech.com">www.hil-tech.com</a> hiltech@hil-tech.com
Brief Description:	<ul style="list-style-type: none"> <li>-designed to capture settleable solids, floatables, oils and grease from storm water runoff</li> <li>-the Downstream Defender is a dynamic separator that augments gravitational forces with complex but stabilized vortex forces to maximize solids/liquids separation, resulting in a compact separator requiring less land area</li> <li>-raw liquid is introduced tangentially into the side of the cylinder and spirals down the perimeter allowing heavier particles to settle out by gravity and the drag forces on the wall and base of the vessel.</li> <li>-a floatables trap is incorporated within the vessel</li> <li>-uses a tangential inlet pipe, 2 cylinders, an inverted cone, a benching skirt and floatables lid</li> </ul>
Effectiveness:	<ul style="list-style-type: none"> <li>-typical design criteria of 90% removal of all particles greater than 150 microns</li> <li>-designed to treat flows from 0.75 – 25 cfs depending on the model size</li> </ul>
Cost: \$\$\$\$\$\$	<ul style="list-style-type: none"> <li>-4 ft. diameter model costs \$10,600    -a 6 ft. diameter model costs \$16,000</li> <li>-8 ft. diameter model costs \$26,000    -a 10ft. diameter model costs \$38,000</li> </ul>
Maintenance:	<ul style="list-style-type: none"> <li>-installation of a 6 ft. model would only take 1-2 hours</li> <li>-sump-vac removes captured sediment and floatables(takes 25 minutes for a 6' model)</li> <li>-1<sup>st</sup> year it should be inspected two times, also recommended that units be cleaned annually</li> </ul>
Applications:	<ul style="list-style-type: none"> <li>-new developments, construction sites, streets and roadways, parking lots, vehicle maintenance yards, airports, truck stops, shopping malls, restaurants, etc...</li> <li>-Case Study: Belleville, Ontario</li> </ul>
Picture:	

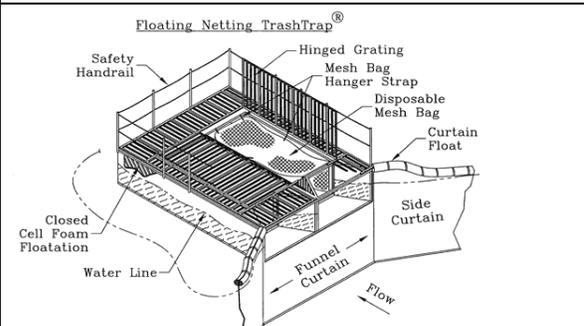


<b>Name of Device:</b>	Stormvault™, Jensen Precast (also provide the JPHV series Stormwater Interceptor) <a href="http://www.jensenprecast.com">www.jensenprecast.com</a> <a href="mailto:info@jensenprecast.com">info@jensenprecast.com</a>
<b>Brief Description:</b>	-a pre-cast multi-chambered rectangular concrete vault with interior chambers separated by baffle walls -contains an inlet baffle to collect floatables and has several sediment baffles -detention time is optimized to promote sedimentation of particles less than 100 microns, this system will collect and hold floatable debris, bed load particulate material, free oil and grease, low solubility and other insoluble petroleum hydrocarbons, settleable sediments, and pollutants including metals, nitrogen and phosphorus nutrients, and organic compounds -add an optional adsorbent pillow to enhance oil and grease capture -(Jensen Precast also offers the JPHV series Stormwater Interceptor which is primarily to remove coarse sediment. It uses a 10 minute detention time for the retention of trash, oil, greases and settleable solids to 100 microns in size. It ranges from \$8900 to \$15,000)
<b>Effectiveness:</b>	-the patent-pending large volume design captures and holds the majority—up to 85%—of runoff events for each design location including the "first flush" of larger events
<b>Cost: NA</b>	-
<b>Maintenance:</b>	-maintenance and observation should occur only after a minimum of seven to ten days of non-flow dry weather and bi-yearly maintenance and observation is recommended
<b>Applications:</b>	-installed and tested in Sacramento, CA and Charlottesville, VA -City of Reno recently installed a Stormvault at the Corporation Yard, a location that serves as a storage facility and parking area for City maintenance vehicles. -installed at Ada Harris Elementary School in San Diego, CA
<b>Picture:</b>	

<b>Name of Device:</b>	CrystalStream Technologies <a href="http://www.crystalstream.com">www.crystalstream.com</a> <a href="mailto:bradcrouch@crystalstream.com">bradcrouch@crystalstream.com</a>
<b>Brief Description:</b>	-The CrystalStream unit is a hydrodynamic separation unit that screens vegetative material and trash and holds it dry above the water line to prevent it from become water-logged and decomposing. -Incoming storm water flows through a fine mesh in the trash basket, capturing floating debris and vegetative matter. -The water proceeds around baffles slowing and spreading the flow and ensuring that the oil gathers at the top. As the water level rises, the oil flows over the edge of the reservoir and the water flows under it to the outflow pipe -As the water rises out of the unit in the back chamber it passes through a 3/4 inch coconut fiber filter, designed to remove smaller floating or suspended materials. Other elements, such as absorbents, flocculants, or charcoal canisters, can be added to target specific pollutants. -the reservoir provides 300 to 900 gallons of emergency spill protection.
<b>Effectiveness:</b>	-Each unit is designed to meet local and national requirements for removal of the targeted pollutants.
<b>Cost:</b>	-Each unit has site specific design and prices range from \$7,000-\$35,000 depending on the site and pollutants
<b>Maintenance:</b>	- Maintenance is performed on an as-needed basis (usually every three months) through a locked access lid on top of the device. -CrystalStream performs the cleaning and maintenance service for their customers
<b>Applications:</b>	-Stand alone water quality on small to large commercial and residential sites as well as treatment rain applications with BMP's to handle fine pollutant removal.
<b>Picture:</b>	 

## End-of-Pipe Devices

Name of Device:	The End-of-Pipe Netting TrashTrap™, Fresh Creek Technologies, Inc. <a href="http://www.freshcreek.com">www.freshcreek.com</a> <a href="mailto:fresh@freshcreek.com">fresh@freshcreek.com</a>	
Brief Description:	-installed at the end of the pipe – often as a retrofit to an existing outfall structure without any modification	
Effectiveness:	-high capture efficiencies of over 90% (documented in EPA sponsored studies)	
Cost: \$\$\$\$	-costs are site specific, can be used for flows as low as 4 cfs to over 4,000 cfs. -capital costs not including installation range from \$1,000 per cfs in large systems to over \$2,000 in smaller systems	
Maintenance:	-nets are serviced by a boom truck; used ones are replaced and transported to a landfill -time between net change outs is determined by the frequency of wet weather and the amount of trash in the flow -change outs are routinely accomplished in under 30 minutes -net inspections may be required after intense storms to check for damage -installation time is between one and five days	
Applications:	-see In-Line Netting TrashTrap application examples	
Picture:	 <p style="text-align: center;"><i>Click to enlarge</i></p>	

Name of Device:	The Floating Netting TrashTrap™, Fresh Creek Technologies, Inc. <a href="http://www.freshcreek.com">www.freshcreek.com</a> <a href="mailto:fresh@freshcreek.com">fresh@freshcreek.com</a>	
Brief Description:	-a modular pontoon structure which floats at the end of the outfall -floating units are generally the most economical solution where site conditions are applicable -site requirements include minimum water depth of two feet and a location that does not interfere with heavily traveled waterways	
Effectiveness:	-high capture efficiencies of over 90% (documented in EPA sponsored studies)	
Cost: \$\$\$\$	-this system is the easiest and least costly to install of all the Netting TrashTraps -costs are site specific, can be used for flows as low as 4 cfs to over 4,000 cfs. -capital costs not including installation range from \$1,000 per cfs in large systems to over \$2,000 in smaller systems	
Maintenance:	-nets are serviced by a boom truck and by replacing the nets and transporting used ones to a landfill -time between net change outs is determined by the frequency of wet weather and the amount of trash in the flow -change outs are routinely accomplished in under 30 minutes -net inspections may be required after intense storms to check for damage -installation time is between one and five days	
Applications:	-see In-Line Netting TrashTrap application examples	
Picture:		

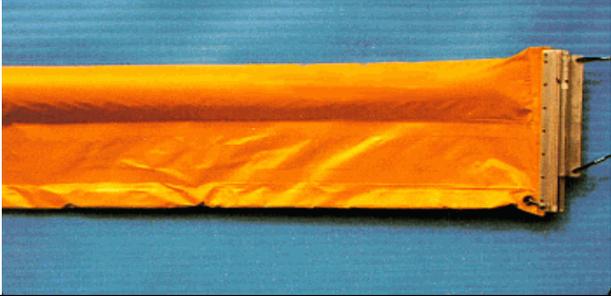
**Other Important Information:**

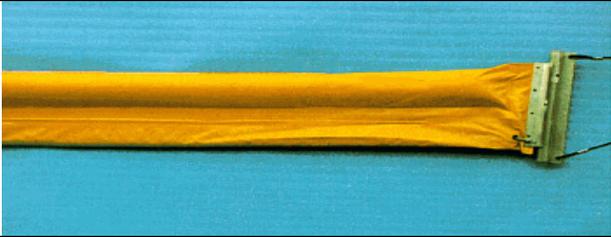
- All systems are designed to handle flow velocities up to 5 feet per second at the mouth of the nets. If higher velocities are expected, velocity-dissipating devices must be installed ahead of the nets and can be designed into the unit.
- Netting TrashTrap® systems are designed and manufactured to give a life expectancy in excess of 20 years.
- The Netting TrashTrap™ systems use the natural energy of the flow and need no external power. Full functionality is achieved with minimal head loss. Systems drain dry at the end of the wet weather event, leaving little or no residual standing water that could otherwise represent breeding ground for mosquitoes and other insects.
- All systems use knotless synthetic knitted nets to capture trash and floatables. Heavy duty nets are available for high-volume flows and high capacity. All netting types have been tested by a certified independent lab for strength and performance characteristics using standard ASTM Test Procedures

<b>Name of Device:</b>	<b>Floating Net Booms, Elastec Inc./ American Marine Inc.</b> (also have several other booms) <a href="http://www.elastec.com">www.elastec.com</a> elastec@elastec.com
<b>Brief Description:</b>	-used for controlling trash and debris, water vegetation, and marine life -manufactured in different materials depending on their purpose -common net materials include stainless steel, and marine grade coated nylon netting -can be custom made to depth and strength requirements
<b>Effectiveness:</b>	-
<b>Cost: NA</b>	-varies according to many factors, email or call for more information (321)636-5783
<b>Maintenance:</b>	-little maintenance required
<b>Applications:</b>	-NYC Dept. of Sanitation uses it to isolate areas where barges off load trash at the Staten Island land fill. -Potomac Electric Power Co., City of San Antonio Public Works Dept.
<b>Picture:</b>	

<b>Name of Device:</b>	<b>MK DB Debris/Ice Barrier Boom, Slickbar Products Co.</b> <a href="http://www.slickbar.com">www.slickbar.com</a> info@slickbar.com
<b>Brief Description:</b>	-this permanent boom is designed to assist in deflecting floating debris and ice away from areas that typically experience extreme congestion from floating objects -designed for heavy and large amounts of floating debris(the MK RB River Boom may be more appropriate) -24"long x 10.5" high Solid Molded Closed Cell Polyethylene Foam or Fiberglass Shell with Urethane foam filled with UV Inhibitors and Anti-Oxidants incorporated for durability -8" to 12" above water surface, 16" to 36" below water surface -2 lbs. per foot of lead ballast weights securely riveted along the bottom edge -corrosion protection consists of hard coated sulfuric anodized aluminum -sections are 50 or 100 foot lengths and weigh 6 to 10 lbs./ft.
<b>Effectiveness:</b>	-has been especially effective in front of fresh water intakes to power plants as well as in front of sensitive pier structures
<b>Cost: \$\$\$\$\$\$</b>	-approximately \$45/ft -has an adjustable tracking system to allow fluctuation which is \$2,000 per end
<b>Maintenance:</b>	-very little maintenance required, it is weather resistant -designed to be left in the water for many years, if growth accumulates it should be cleaned off
<b>Applications:</b>	-a MK debris boom deflecting debris into a trash rack collection system is used on the Cumberland River in Kentucky and in Connecticut in front of a power plant
<b>Picture:</b>	

<b>Name of Device:</b>	<b>MK RB River Boom, Slickbar Products Co.</b> <a href="http://www.slickbar.com">www.slickbar.com</a> <a href="mailto:info@slickbar.com">info@slickbar.com</a>
<b>Brief Description:</b>	-has been engineered to be the best design for deflecting oil to quiet recovery areas -would be a more appropriate than the MK debris boom for controlling debris of smaller size -constructed with an internal secured float system which allows for a smooth exterior float chamber
<b>Effectiveness:</b>	-very effective for containing floating debris
<b>Cost: \$\$\$\$</b>	-approximately \$30/ft -has an adjustable track system to allow fluctuation, \$2,000 per end
<b>Maintenance:</b>	-weather resistant material -designed to be left in the water for many years, if growth accumulates then it should be cleaned
<b>Applications:</b>	-used in Kentucky
<b>Picture:</b>	

<b>Name of Device:</b>	<b>Portable Containment Boom, Bowhead Manufacturing Co., LLC</b> <a href="http://www.bmccatalog.com">www.bmccatalog.com</a> <a href="mailto:bmc@bowhead.com">bmc@bowhead.com</a>
<b>Brief Description:</b>	-2 sizes available, 50' and 100' booms -booms are double chambered with foam logs in heavy-duty polyethylene tube that seals each chamber, foam logs are then encased in individual polyethylene tube that is positioned in a 22 oz. PVC continuous chamber -anchor points every 10 feet -ASTM universal slide connectors -skirt features 5/16" coil proof galvanized chain that pulls weight to bottom of the water -8"float and a 12" skirt -custom sizes and colors are available -more appropriate than the Inflatable Containment Boom below b/c it will remain in place for many years if you need it for that long; the inflatable boom is more for emergencies
<b>Effectiveness:</b>	-effective for oceans, lakes, streams and inlets
<b>Cost: \$\$\$</b>	-a 50' boom costs \$725 -a 100' boom costs \$1,295
<b>Maintenance:</b>	-boom is made of a weather resistant plastic so little maintenance is required -if a section of the boom was damaged by a tree branch or boat, that section only would need to be replaced
<b>Applications:</b>	-use around fueling docks, vessels, marinas, or reservoirs
<b>Picture:</b>	

Name of Device:	Inflatable Containment Boom, Bowhead Manufacturing Co., LLC <a href="http://www.bmccatalog.com">www.bmccatalog.com</a> bmc @bowhead.com
Brief Description:	<ul style="list-style-type: none"> <li>-has a continuous chamber</li> <li>-15 PSI inflation</li> <li>-inflates in under 2 minutes</li> <li>-anchor points every 25'</li> <li>-30 oz. Polyethylene fabric</li> <li>-ASTM universal slide connectors</li> <li>-extremely compact storage</li> <li>-skirt features 5/16" coil proof galvanized chain that pulls weight to bottom of water</li> <li>-8" float and a 12" skirt</li> </ul>
Effectiveness:	-more effective and appropriate for emergency situations, will not last as long as the portable boom
Cost: \$\$\$	<ul style="list-style-type: none"> <li>-a 50' boom costs \$907</li> <li>-a 100' boom costs \$1,725</li> </ul>
Maintenance:	-no major maintenance required
Applications:	-good for emergency use
Picture:	

Name of Device:	Containment Boom, BOOM Environmental Products <a href="http://www.boomenviro.com">www.boomenviro.com</a> boomenvi@mindspring.com
Brief Description:	<ul style="list-style-type: none"> <li>-contains oil and debris</li> <li>-convenient, lightweight, and foldable</li> <li>-100' and 50' sections and custom sizes are available</li> <li>-vinyl coated polyester or nylon – ultraviolet resistant</li> <li>-fabric strength is 400 lbs. minimum tensile</li> <li>-lead weights provide ballast</li> <li>-works in currents up to 2 knots</li> <li>-18" width, 6" above water, 12" submerged</li> <li>-this boom planes at a 45 degree angle at winds in excess of 15 knots</li> <li>-Boom Environmental also provides a Turbidity Curtain</li> </ul>
Effectiveness:	-very effective for marinas, fire departments, haz-mat response
Cost: \$\$\$	<ul style="list-style-type: none"> <li>-boom size of 18" x 100' costs \$1,500</li> <li>-boom size of 18" x 50' costs \$800</li> <li>-turbidity curtain ranges from \$1,710 to \$2,045</li> </ul>
Maintenance:	-little maintenance required, can be cleaned with industrial detergents and water
Applications:	<ul style="list-style-type: none"> <li>-City of Cambridge, MA Hazmat team and the Buzzards Bay Coalition in MA are a few examples</li> <li>-some of BOOM®'s other products have been used in large spills such as the Exxon Valdez and a spill that occurred in the Galapagos Islands</li> </ul>
Picture:	

<b>Name of Device:</b>	<b>SiltMaster® Turbidity Curtain(Type 1), Parker Systems Inc.</b> <a href="http://www.parkersystemsinc.com">www.parkersystemsinc.com</a> <a href="mailto:info@parkersystemsinc.com">info@parkersystemsinc.com</a>
<b>Brief Description:</b>	-contains silt and debris -variety of Type I through Type III turbidity curtains are available depending on the current of the water and if it is subject to wind -Type I should be used in protected areas where there is no current and the area is sheltered from wind and waves(such as a lake or pond); Type II should be used in areas where there may be moderate running water with a current of up to 3.5 ft/sec(rivers);Type I would most likely be the most appropriate curtain to use -material can either be 18 and 22 oz. PVC, 24 oz. Alloy, 23 oz. Urethane which are all impervious, or it can be a geotextile fabric which is pervious -standard section lengths of 50' or 100' are available, custom sizes are also available -the skirt depth can be prescribed to control only surface flow or full depth -available in yellow, orange, and black -the Mark II Oil Boom may also be appropriate
<b>Effectiveness:</b>	-For a geotextile curtain, the puncture strength is 145 lbs. and it allows a water flow rate of 19-21 gpm and it is 90% UV resistant at 500 hours
<b>Cost: \$ or \$\$</b>	-costs vary with Type I – Type III, fabric type, length of sections, and skirt depth -a Type I, 18 oz. PVC curtain ranges from \$7.09/ft to \$15.94/ft -a Type I, Geotextile curtain ranges from \$4.11/ft to \$7.02/ft
<b>Maintenance:</b>	-if repairs to the geotextile fabric become necessary, there are repair kits available from Parker Systems Inc.
<b>Applications:</b>	-used for construction and industrial activities and meets many D.O.T. Type I/ Type 2 Requirements
<b>Picture:</b>	

<b>Name of Device:</b>	<b>Marine-Containment Booms or Mini Creek Boom, Complete Environmental Products, Inc.</b> <a href="http://www.cepsorbents.com">www.cepsorbents.com</a> <a href="mailto:Jclay@cepsorbents.com">Jclay@cepsorbents.com</a>
<b>Brief Description:</b>	-containment booms range from 10" x 50' to 18" x 100' to 36" x 100' -mini creek boom is 5" x 25' -all CEP containment booms use ASTM aluminum end connectors -are UV resistant -made from 22 oz. PVC Jaton fabric
<b>Effectiveness:</b>	-mini creek boom is very effective in smaller and slow moving water bodies
<b>Cost: \$ or \$\$</b>	-containment boom ranges from \$583 to \$3,000 -mini creek boom is approximately \$189
<b>Maintenance:</b>	-no major maintenance needed
<b>Applications:</b>	-can be used in ditches, creeks, near drains and runoff areas
<b>Picture:</b>	NO PICTURE AVAILABLE

<b>Name of Device:</b>	<b>Optimax II Containment Booms , Advantech, Inc./American Marine Inc.</b> <a href="http://www.advantech-inc.com">www.advantech-inc.com</a> <a href="mailto:info@advantech-inc.com">info@advantech-inc.com</a>
<b>Brief Description:</b>	-containment boom that meets OPA-90 protected water and fast current specifications -dual tension and contractor's favorite -Height – 20" (8" x 12") and weight is 2.2 lbs/ft. -Actual Break strength – 6,400 lbs. -Fabric – 22 oz. Vinyl -lengths of 50 ft. and 100 ft. -the president of Advantech stated in his letter that the Texas sun would eat up the standard 22 oz. PVC in a year or two and that it is necessary to purchase the XR-5B fabric -depending on site conditions, Minimax or Simplex boom may also be suitable
<b>Effectiveness:</b>	-appropriate for containing floatables
<b>Cost: \$\$\$ or \$\$\$\$</b>	-50 ft. section costs \$11.95/LF for Vinyl, \$14.65/LF for XR-5B, and \$17.80/LF for urethane(LF meaning linear foot) -100 ft. section costs \$10.95 for Vinyl, \$13.65 for XR-5B, and \$16.80 for urethane -some accessories may be necessary depending on the specific application
<b>Maintenance:</b>	-no major maintenance required
<b>Applications:</b>	-oil booms were used in Austin,Tx to control floatables in 2 urban creeks -a few of the other booms that Advantech provides will also control floatables and will depend on deployment conditions and service requirements
<b>Picture:</b>	

<b>Name of Device:</b>	<b>Oil Containment Boom(used for floatables), Action Petroleum Spill Recovery, Inc.</b> <a href="http://www.actionpetro.com">www.actionpetro.com</a> <a href="mailto:actionpetro@aol.com">actionpetro@aol.com</a>
<b>Brief Description:</b>	-a boom used to contain floatables (trash boom)is less complex and expensive than one used for oil -the most appropriate boom, one that will collect street litter floatables, is a 10" boom with a 6" float and a 12" skirt -manufactured in 100 ft sections, shorter sections are available but will cost more per foot b/c there is more labor involved due to a greater number of end connectors -an 18" boom with a 6" float, 12" skirt, and 100 ft sections is a more standard boom that will also contain larger debris such as logs
<b>Effectiveness:</b>	-will contain street litter floatables but not larger floating debris such as logs
<b>Cost: \$\$\$</b>	-for the street litter boom it would cost approximately \$5.00/ft -if you need smaller than a 100 ft section it will cost an extra 50 cents/ft -for the standard boom that will contain logs, it will cost \$5.95 /ft for 100 ft sections
<b>Maintenance:</b>	-no major maintenance required -if they become extremely dirty they can be washed off with a pressure washer -if left in the sun it will not last as long as expected (average lifespan is 5-10 years)
<b>Applications:</b>	-TPWD and the Tennessee Parks and Wildlife used booms for street litter floatables -sold oil booms to TX,FL, MS,WA, the US Navy, Coast Guard, Mobile, Exxon,Chevron
<b>Picture:</b>	

**Booms may require accessories depending on the specific application. Boom prices may be lower if ordered in larger quantities.**

**For More Boom Information:**

**[www.oil-spill-web.com](http://www.oil-spill-web.com) -this is a very useful website, go to the directory link and it will provide companies that manufacture or distribute booms and other related products**

Name of Device:	TrashCat™ Trash Skimmers, United Marine International LLC is a subsidiary of Liquid Waste Technology, Inc. <a href="http://www.trashskimmer.com">www.trashskimmer.com</a> LShenman@aol.com
Brief Description:	<ul style="list-style-type: none"> <li>-a large skimmer vessel that removes floating trash and debris from harbors, rivers, streams, marinas, recreational lakes, hydroelectric dams and reservoirs</li> <li>-a catamaran type, twin-hull vessel on which are mounted hydraulically powered and controlled open mesh conveyor systems to move materials</li> <li>-a front mounted continuous conveyor can be lowered into the water and is capable of skimming floating debris off the surface to depths of up to 2-1/2 feet below the surface</li> <li>-equipped with vertical, conveyORIZED skimming "wings" mounted on each side of the main pickup conveyor, UMI TRASHCATS™ are capable of skimming 16 feet wide.</li> <li>-3 models available, varying in skimming width, skimming depth, on-board storage capacity, and weight volume</li> <li>-accessories include: a tilt-deck trailer to transport the skimmer to other waterways and a conveyer to transport trash directly from the skimmer into a dump truck</li> <li>-requires at least 2 workers on board</li> </ul>
Effectiveness:	<ul style="list-style-type: none"> <li>-can retain and store anywhere from 1,500 lbs up to 12,000 lbs or 700 cubic feet of material. Long logs and items of up to 48 inches in diameter are not a problem</li> <li>-in Newark Bay, a vessel collected 70 tons of trash in one year</li> <li>-effective in producing positive results, therefore leading to many reorders from customers</li> </ul>
Cost: \$\$\$\$\$\$	<ul style="list-style-type: none"> <li>-they are sold in systems including the vessel, trailer, transfer conveyor, and a power pack</li> <li>-the systems are sold in 3 sizes; the smallest system is approximately \$250,000</li> </ul>
Maintenance:	<ul style="list-style-type: none"> <li>-Overall maintenance cost is approximately \$2-5/hr</li> <li>-maintenance measures are dependant upon environmental conditions</li> <li>-after several years, it may be necessary to replace parts such as air or oil filters</li> <li>-many parts are standardized in order to make purchasing replacement parts easier and less expensive</li> <li>-Maintenance Operation Manuals and Repair Manuals are provided</li> </ul>
Applications:	<ul style="list-style-type: none"> <li>-several are used in New York City(NY Harbor is currently home to 11 boats), Newark Bay, Baltimore's Inner Harbor, on the Colorado River, and also in Hong Kong, France, Brazil, and S. Korea</li> <li>-Austin, Texas City Council purchased a small TrashCat for Town Lake and Houston is currently in the process of purchasing a small system as well</li> </ul>
Picture:	

Name of Device:	<p>Water Witch Marine Debris Clearance Vessels, Liverpool Water Witch Marine &amp; Engineering Co. Ltd.  <a href="http://www.waterwitch.com">www.waterwitch.com</a>  <a href="mailto:sales@waterwitch.demon.co.uk">sales@waterwitch.demon.co.uk</a></p>
Brief Description:	<ul style="list-style-type: none"> <li>-in addition to debris collection, it can also dredge, remove aquatic weeds, provide lifting duties, pusher tug, fire and salvage operations, and offer a fast oil spill response service</li> <li>-the vessel can handle anything from small plastic floatables to logs, trees, floating and submerged garbage, aquatic weeds and more</li> <li>-has a mesh scoop attachment that is ideal for collecting general debris, floating or submerged</li> <li>-company offers a range of designs to meet the customer's exact requirements</li> <li>-this vessel is a shallow draft, one man operation, multi-purpose workboat fitted with hydraulically operated front end loader with a general purpose 2.5m<sup>3</sup> collection scoop. Has a Perkins/Caterpillar M130C Marine Diesel Engine.6.7m long, has a lifting capacity of 750kg, and has a speed of 6.5 knots</li> </ul>
Effectiveness:	<p>-can lift 2.3m<sup>3</sup> every 3 minutes giving 46 m<sup>3</sup> recovery every hour (was achieved under test conditions by the City of Coral Gables)</p>
Cost: \$\$\$\$\$\$	<p>-price of a Mark 2 Water Witch Surface Dredger is \$212,400 (includes on-board spare parts for 2 years operation)  <u>Optional Accessories:</u> Salvage Pump costs \$4,770 , 1Skipper Barge System &amp; 2 Open Top Skips(6m<sup>3</sup>,for storage/transfer of recovered debris) costs \$11,500</p>
Maintenance:	<p>-vessel and all equipment and accessories is covered by a comprehensive warranty for a full 12 months from the date of hand-over. All vessels are constructed to Lloyds Register of Shipping standards and constructed from Lloyds Grade A steel plate. Built within UK MCA Code of Practice for Workboats. Many of their vessels are over 30 years old and still operate on a daily basis.</p>
Applications:	<ul style="list-style-type: none"> <li>-there are now 65 Water Witch Vessels in operation worldwide including: New York, Hong Kong, Singapore, Durban and London</li> <li>-US customers include the Port of Baltimore, New York Department of Sanitation, City of Coral Gables, FL</li> <li>-the Cardiff Harbour Authority in the UK purchased a vessel with all its accessories and in a 12 month period and a 35 hour working week, the vessel collected 892 tonnes(3,408m<sup>3</sup>) of debris</li> </ul>
Picture:	

<b>Name of Device:</b>	JBF Response Vessels with a Debris Recovery System, JBF Environmental Technology/ Slickbar Products Co. <a href="http://www.slickbar.com">www.slickbar.com</a> <a href="mailto:info@slickbar.com">info@slickbar.com</a>
<b>Brief Description:</b>	-the debris recovery system can be installed on all of the Response Vessels from the 23 foot JBF420 to the off-shore DIP7000 -the simple but effective lifting belt debris system allows the vessels to have multi-function roles(can operate in time of oil spills or daily debris collection) -the oil recovery systems include small, portable, shallow water units, Vessel of Opportunity Skimming Systems, Recovered Oil Storage Barges, Shallow Water Multipurpose Boats, Harbor Skimmers, and complete offshore Oil Spill Recovery Vessels
<b>Effectiveness:</b>	-
<b>Cost: NA</b>	-
<b>Maintenance:</b>	
<b>Applications:</b>	-JBF has manufactured over 225 oil spill recovery systems and vessels -there are systems in operation in the U.S., Canada, S. America, Asia, Europe, Africa, the Caribbean, and Australia
<b>Picture:</b>	

**The information provided was derived from each company's website, a Product Catalog sent to me by the company, or a phone or email response from a company representative. The given products should help to reduce, collect, and control floatables from storm water runoff. Most companies included in this document have numerous storm water products and there may be some products more appropriate for your city's specific needs that may not be included in this document.**

For more information contact :

- The company contact information available, or
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(817)695-9225  
[tokeefe@nctcog.org](mailto:tokeefe@nctcog.org)

<b>\$1.00- \$250</b>	<b>= \$</b>
<b>\$250 - \$500</b>	<b>= \$\$</b>
<b>\$500 - \$1000</b>	<b>= \$\$\$</b>
<b>\$1000 - \$2000</b>	<b>= \$\$\$\$</b>
<b>\$2000 - \$10,000</b>	<b>= \$\$\$\$\$</b>
<b>\$10,000 - \$30,000</b>	<b>= \$\$\$\$\$\$</b>
<b>&gt; \$30,000</b>	<b>= \$\$\$\$\$\$\$</b>

**What is NCTCOG?** The North Central Texas Council of Governments (NCTCOG) is a voluntary association of local governments established in 1966 to assist local governments in planning for common needs, cooperating for mutual benefit, and coordinating for sound regional development. NCTCOG's purpose is to strengthen both the individual and collective power of local governments and to help them recognize regional opportunities, eliminate unnecessary duplication, and make joint decisions. NCTCOG serves a 16-county region of North Central Texas centered around the two urban centers of Dallas and Fort Worth. Currently, NCTCOG has 232 member governments including all 16 counties, 164 cities, 26 school districts, and 26 special districts.