...IT ENDS UP IN THE BAYOU

Michael D. Talbott, P.E., Executive Director
Harris County Flood Control District

Bayou Preservation Association Symposium
October 9, 2015
• District Overview
• MS4 Permit and Categorization
• Current BMPs
• Fighting Floatables
• Maintenance Projects
• Hidden Floatables
• Public Education/ Source Control
AREA = 1756 SQUARE MILES
1500 ± CHANNELS
2500 ± MILES OF CHANNELS
POPULATION = 4.2 MILLION (COUNTY)
2.0 MILLION (HOUSTON)
Flood Control District’s Priorities

- **Flood Damage Reduction**
  - Devise the Plans
  - Implement the Plans

- **Maintain the Infrastructure**
  - Sustainable Operations & Maintenance Practices

- **Permit Compliance**
  - TPDES Permits (MS4, Construction, Pesticide)
    - Stormwater Management Program (SWMP)
    - Best Management Practices (BMPs)
  - Local Stormwater Quality Permit(s)
Floatables Categorization

- Plastic
- Foamed Plastic
- Glass
- Rubber/ Latex
- Metal
- Paper
- Cloth
- Processed Wood
- Unprocessed Wood
- Organic Debris
- Unusual Miscellaneous Items

Vast majority of floatables fall into this category.
BMPs for Floatables

• Detention Basins
  – Natural collection area for debris during flood events
  – Vegetation, floatables collection screens, netting systems, and booms, for more frequent flows

• Channels
  – Bankfull bench
  – Booms, collection devices
Wet Bottom Detention Basins with Water Quality Features

HARRIS COUNTY FLOOD CONTROL DISTRICT

DESIGN GUIDELINES FOR HCFCD WET BOTTOM DETENTION BASINS WITH WATER QUALITY FEATURES
Wetland for Floatables Collection

From: Design Guidelines for HCFCD Wet Bottom Detention Basins with Water Quality Features
Wetland for Floatables Collection

Katy Park: T101-01-00
Arthur Storey Park: D500-06-00
Detention Basin Collection Device

Fallbrook Detention Basin; White Oak Bayou @ Fallbrook & Jones
How it Works

In-Line Netting TrashTrap®

Bypass Screen
Bollards
Access Doors
Access Hatch
Pipe Connection

Guide Frame With Flow Director Plates
Lifting Baskets And Disposable Bags
Flow Director

Fresh Creek Technologies, Inc. ®
<table>
<thead>
<tr>
<th>Location and System Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HCFCD Basin ID:</strong></td>
</tr>
<tr>
<td>Floatable Collection Date:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Captured Floatable Categorization (Visual Count and Characterization)³</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HCFCD Basin ID:</strong></td>
</tr>
<tr>
<td><strong>Item</strong></td>
</tr>
<tr>
<td>Plastic</td>
</tr>
<tr>
<td>Foamed Plastic</td>
</tr>
<tr>
<td>Glass</td>
</tr>
<tr>
<td>Rubber/Latex</td>
</tr>
<tr>
<td>Metal/Aluminum</td>
</tr>
<tr>
<td>Paper</td>
</tr>
<tr>
<td>Cloth</td>
</tr>
<tr>
<td>Processed Wood</td>
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<tr>
<td>Unprocessed Wood</td>
</tr>
<tr>
<td>Organic Debris</td>
</tr>
<tr>
<td>Unusual Miscellaneous Items</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Volume of Floatables</th>
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</thead>
<tbody>
<tr>
<td><strong>HCFCD Basin ID:</strong></td>
</tr>
<tr>
<td><strong>Disposable Mesh Bag ID</strong></td>
</tr>
<tr>
<td>Field Measured Dimensions (bxdxh)</td>
</tr>
<tr>
<td>Estimated Volume (ft³)</td>
</tr>
<tr>
<td>Estimated Volume (yd³)</td>
</tr>
<tr>
<td>Total Volume (ft³)</td>
</tr>
<tr>
<td>Total Volume (yd³)</td>
</tr>
</tbody>
</table>
Total Volume Removed
(Including Organic Debris)
866 cubic ft
910 lbs
4 lbs/acre/year
Net Contents
White Oak Bayou Floatable Nets Items (% of Total Count) – Excluding Organic Debris

- Plastic, 48%
- Metal, 13%
- Foamed Plastic, 13%
- Unprocessed Wood, 11%
- Paper, 3%
- Rubber/Latex, 9%
- Unusual Miscellaneous Items, 1%
- Cloth, 1%
- Glass, 0%
- Processed Wood, 1%
Floatable Collection Screens

- Permanent, Post-Construction BMP
- Integrated into basin outfall structure(s)
- Accepted for maintenance by HCFCD Criteria
- Prevents floatables from escaping downstream
- Requires hand work to clean
- Design of screen being revised to facilitate maintenance
Fighting Floatables

- Permanent floatable controls – continually updating techniques
- Updating HCFCD facilities maintenance contracts to include debris removal
- Houston Parks Board
- Trash Bash Partner
Field Surprises: Hidden Floatables
Problem Solving

Upstream end of HCFCD channel receives stormwater (and debris) from highly urbanized area.
Field Surprises: Hidden Floatables
Problem Solving

* Installed on the D/S side of the project to collect floatables. Desilt worked from the D/S limits of the project to the U/S limits. Floatables were collected against the orange construction fence as the blocked water from the storm sewer system drained out.

* Upon completion of the desilt, a trash truck was called out to collect the floatables.
Other Gross Stuff

Balancing Pollutant Concerns with Function

Large debris such as woody materials, shopping carts, tires, etc. provide:

- Habitat
- Bedform
- Grade Control
- Carbon source – woody debris
- Possible source of pollutants (hydrocarbons, metals)
- Impediment to flood water conveyance
- Limitation of easy recreation
Large Debris

Tire Riffle

Pool

Riffle

Riffle

Riffle
Large Debris
# Maintenance

Summary table for 2014-15 MS4 permit year.

<table>
<thead>
<tr>
<th>Task</th>
<th>Unit of Measure</th>
<th>Service Centers/Staff</th>
<th>Contract Services</th>
<th>Totals</th>
<th>Costs</th>
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</thead>
<tbody>
<tr>
<td>Litter/Floatables Removal</td>
<td>Cu. Yd.</td>
<td>2785</td>
<td>2202</td>
<td>4,987</td>
<td>$328,610</td>
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<tr>
<td>Tires</td>
<td>Each</td>
<td>214</td>
<td>4829</td>
<td>5,043</td>
<td>$92,105</td>
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<td>Miscellaneous Debris</td>
<td>Cu. Yd.</td>
<td></td>
<td>163</td>
<td>163</td>
<td>$9,169</td>
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<tr>
<td>Organic Wood</td>
<td>Cu. Yd.</td>
<td></td>
<td>27,664</td>
<td>31,972</td>
<td>$1,186,959</td>
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</tbody>
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Maintenance

Between August 2014- July 2015
HCFCD removed and disposed of over 5000 tires.