Harris County Flood Control District’s Approach to Managing Waters of the U.S.

Jonathan W. Holley
SAME WOTUS Workshop
October 22, 2019
Agenda

• Overview of District operations and how they intersect with Clean Water Act (CWA) regulations
• Environmental enhancements for flood control projects
• Example strategies for avoidance, minimization, and mitigation
• Mitigation banking program for unavoidable impacts
...to provide flood damage reduction projects that work with appropriate regard for community and natural values.
Not limited to this

White Oak Bayou
Stormwater Treatment

- Plant nutrient uptake and filtration
- Extended detention
  - Sediment settling
  - UV breakdown
- Shading of water
- Re-establishment of ecosystem services
• Stormwater Treatment Wetlands
• Reforestation Areas
• Riparian Zones
• Floatables Removal Devices
• Water Quality Monitoring Stations
Reforestation of Dry Bottom Basin

E500-06-00 (9-years)
Natural Stable Channel Design

Upper Bank Canopy Trees (400 trees per acre on 50% of slope)

Riparian Canopy Trees (at outer bends of bankfull channel, no more than 25% of geomorphic floodplain)

Maintenance Berm

Trail

Meandering Bankfull Channel
Wet Bottom Detention Basins with Water Quality Features

Field Guide for Plant Identification
Volume One: Reforestation
Trees, shrubs, vines, and undesirable plants found in our channels and basins

Field Guide for Plant Identification
Volume Two: Wetlands
Vegetation common to Harris County wetland areas

Streambank Stabilization Handbook
Avoidance
Bretshire Detention Basin
Wetland Planting

Bretshire Detention Basin
Bretshire Stormwater Detention Basin

April 14th, 2014

May 27th, 2015
Minimization
Compensation

Concrete Lined

115’ R.O.W.

14’ Bottom Width
Compensation

Grass Lined

60’ Bottom Width

210’ R.O.W.

60’ Bottom Width
Compensation

Stream Corridor

260’ R.O.W. WIDTH

50’ 15’ 45’
Compensation

Stream Corridor

BASE CHANNEL WITH FLOOD BENCH
Compensation

BASE CHANNEL WITH FLOOD BENCH
Compensation
<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basin Size</td>
<td>288 acres</td>
</tr>
<tr>
<td>Detention Capacity</td>
<td>2,325 acre-feet</td>
</tr>
<tr>
<td>Ponds</td>
<td>~90 acres</td>
</tr>
<tr>
<td>Wetlands</td>
<td>~27 acres</td>
</tr>
<tr>
<td>Stream</td>
<td>~5,000 linear feet</td>
</tr>
<tr>
<td>Riparian and Forest</td>
<td>25+ acres</td>
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</tbody>
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Design Considerations

• **Environmental**
  - NEPA (National Environmental Policy Act)
    - Mitigation for Non-Jurisdictional Wetlands
  - 200-foot Riparian Corridor
  - Stormwater Quality Permit

• **Community**
  - Preserve Flying Club
  - Avoid Drilling Sites
<table>
<thead>
<tr>
<th>Forecasted Schedule for Kuykendahl Detention Basin*</th>
<th></th>
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<tbody>
<tr>
<td>Basin Construction Complete</td>
<td>June 2020</td>
</tr>
<tr>
<td>Turf Establishment</td>
<td>June 2020</td>
</tr>
<tr>
<td>Wetland Vegetation Planting</td>
<td>July 2020</td>
</tr>
<tr>
<td>Tree and Riparian Planting</td>
<td>February 2021</td>
</tr>
</tbody>
</table>

*Dates dependent on environmental factors
Mitigation Banking
Greens Bayou Wetlands Mitigation Bank

Sub C
691 ac

Sub B
170 ac

Sub A
47 ac
K700-01-00
Katy Hockley Mitigation Bank
K700-01-00

Katy Hockley Mitigation Bank
• More than Drainage and Flood Control
• Detention basins improve water quality and replace habitat
• Natural Stable Channel Design creates functional lift
• Mitigation banking when options constrained