STUDY ELEMENTS

Big Creek basin data collection
Hydrologic modeling
Hydraulic modeling
Flood mitigation projects
Data collected consisted of the following:

- GIS data for Shelby and Tipton counties
  - Lidar Data
  - Soils/Land Use Data
  - Nexrad Data
- Field survey channel cross-sections and bridge data
  - 75 additional cross-sections
- Drainage studies
  - Previous Corps studies
HYDROLOGIC MODEL

HEC-HMS & HEC-GeoHMS Model used
100-year and 500-year design flows
DATA

Soils

Land Use

LiDAR

NEXRAD

Hydrologic Model
HEC-RAS & HEC-GeoRAS models for water surface elevations
Extended model upstream into Tipton County
100-year and 500-year water surface elevations
May, 2010 water surface elevations for model validation
MAY 2010 HIGHWAY 51 FLOOD INUNDATION
MAY 2010 SINGLETON PARKWAY
Identify flooding locations and conceptual projects to mitigate flooding

Mitigation alternatives

Alternative 1 - Temporary detention upstream
Alternative 2 - Enhanced protection
Alternative 3 - Diversion of high flows
Maximum water surface elevation reduction at Navy base (BCRM 11.54) equals 1.52'
Effective at reducing water surface elevations

Significant land acquisition

Moderate to high total project cost depending on site or combination of sites selected
BIG CREEK ALTERNATIVE 2 – RAISE EAST LEVEE FINDINGS

Prevents flooding of Navy base due to levee overtopping
No significant effect on water surface elevations
No land acquisition
Lower project cost
Maximum water surface elevation reduction of 1.04’ at RM 11.54 (Just upstream of Singleton Pkwy.)
BIG CREEK ALTERNATIVE 3 – HIGH FLOW DIVERSION FINDINGS

Effective in reducing water surface elevations

Minimal land acquisition

High construction cost (two new bridges)
## COMPARISON OF VARIOUS STUDY ALTERNATIVES
### BIG CREEK DRAINAGE STUDY
#### SHELBY COUNTY TN GOVERNMENT

<table>
<thead>
<tr>
<th>ALTERNATIVES</th>
<th>DECREASE IN WATER SURFACE ELEV. FOR 500-YR. STORM AT:</th>
<th>DECREASE IN WATER SURFACE ELEV. FOR MAY, 2010 STORM AT:</th>
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<tbody>
<tr>
<td></td>
<td>U.S. HWY 51</td>
<td>SINGLETON PKWY.</td>
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<tr>
<td><strong>ALTERNATE #1-TEMPORARY DETENTION UPSTREAM</strong></td>
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<tr>
<td>Big Creek Dam #1</td>
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<td>Crooked Creek Dam</td>
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<td>Royster Creek Dam</td>
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<td>Big Crk. #1 &amp; Crooked Crk. Dams</td>
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<td>2.15</td>
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<td><strong>ALTERNATE #2-ENHANCED LEVEE PROTECTION</strong></td>
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<td>Raise East Navy Base Levee</td>
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<td><strong>ALTERNATE #3-HIGH FLOW DIVERSION</strong></td>
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<td>Crooked Creek Diversion</td>
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<td>1.36</td>
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WORK GOING FORWARD

Develop and evaluate additional potential projects
Evaluate combinations of projects
Questions!

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