Town of Dyer

February 27, 2020

Stormwater Efforts

Town of Dyer - Overview

- Dyer is in Lake County, Indiana
- Population 16,400
- Settled in 1838
- Incorporated in 1910
- 6.2 Square Miles

Stormwater Master Plan

Overview

- Dyer is in Lake County, Indiana
- Population 16,400
- Settled in 1838
- Incorporated in 1910
- 6.2 Square Miles

Overview

- Dyer is in Lake County, Indiana
- Population 16,400
- Settled in 1838
- Incorporated in 1910
- 6.2 Square Miles

Town of Dyer - Brief History

- Aaron Norton Hart, a settler from Pennsylvania, played a key role in Dyer's infrastructure.
- In the 1860s and 1870s, Hart supervised the construction of roads and the implementation of a drainage ditch system.
- Hart's ditches were built to drain Cady Marsh, allowing agricultural and commercial use of the marshy land in the area.
- Hart was killed in 1883 while working on a ditch near Plum Creek. Hart Street, one of Dyer's major north-south streets, bears his name. Hart's wife, Martha Dyer Hart, is the town's namesake.

Kings Map of Indiana, 1852

Library of Congress: http://hdl.loc.gov/loc.gmd/g4090.rr002090

Plum Creek

- Ice Harvesting
- 1923

Library of Congress: http://hdl.loc.gov/loc.gmd/g4090.rr002090
Town of Dyer – 1952 at Little Calumet

Plum Creek / Hart Ditch
- Illinois – Plum Creek
  - 36mi² at State Line
- Indiana – Hart Ditch
  - 71mi² at Little Calumet River

Town of Dyer Flooding Areas

August 2007
- Wet Watershed
  - 5" on the 23rd
  - 9" rise in 18 hrs.
  - 14' total rise
- $2.8 Million in Damages

August 2007
- $33 Million in Damages at Hospital Alone

August 2007
- $4.0 Million in Damages with over 300 homes affected throughout Dyer
Dry watershed
9" 13th & 14th
Hurricane Ike
8' rise in 18hrs
15' total rise

Source: Lake County Surveyors Office

Northgate Subdivision – Photo Looking Southeast

Dyer Stormwater Management

- The Town has had its fair share of significant overbank flooding.
- Has seen firsthand the effect of frequent severe storms have on infrastructure (> "design" storms)
- The Town has become forward thinking and resilient in planning efforts
  - Stress BMPs, water quantity and quality review for new developments
- Focus on water quality
  - Ordinance inclusion
  - WQ Detention BMPs
  - Vegetated swales/filter strips
  - Floating wetlands

Projects:
Hardest Hit Areas

- Multi-phase projects throughout subdivisions
- Hospital projects
Berens Monaldi Floodwall

- Phase 1 overtopping
- Sep 2008

Observed Decadal Trend of Heavy Precipitation (2-day, 5-year RI) in Midwest (1901-2012 compared with 1901-1960)

Observed % Change in Total Annual Precipitation Falling in the Heaviest 3% of Events (1954 – 2016)

Stormwater Master Plan

Historical Data Compared to Regulatory Data

Harl Ditch at Munster USGS Gage Annual Peak Flow Statistics (1943-2018)

Project:
Berens Monaldi Floodwall
Cap of Phase 1

Berens Monaldi September 2008
Must avoid this!
Project: Berens Monaldi Storm Sewers and Pump Station

• Incorporate GI techniques
• Stormwater cells / trees
• Challenges identified by manufacturer
• Historical overbank areas
  - Soils are undrained, peat, loam
  - Area is saturated

Resiliency – Water knows no boundaries

• Store the water before it flows downstream to cause damage
• Construct a reservoir in the upstream portion of the watershed
• Challenges – how do you fund a project in Illinois while residing in Indiana

<table>
<thead>
<tr>
<th>Storage (ac-ft)</th>
<th>Cost ($ Million)</th>
<th>Reduction in Risk Level (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>330</td>
<td>7.0</td>
<td>0.4</td>
</tr>
<tr>
<td>670</td>
<td>12.8</td>
<td>1.3</td>
</tr>
<tr>
<td>1020</td>
<td>21.0</td>
<td>1.8</td>
</tr>
</tbody>
</table>
Additional Resiliency Efforts

- Collaboration with the National Weather Service
- Advanced Hydrologic Prediction Service (AHPS)
- Collaboration with the USGS
- Early warning system

Urbanization of the Watershed

- We have seen the Town of Dyer working to live within the influence of the watershed
- Large scale BMAP (Will County Reservoir) may be constructed to address the reality of overbank flooding
  - Dyer has been engaged in a multi-year process
  - Explore all funding options
  - Grants, economic interests, conservation policies
  - Unique habitat opportunity

- Historical actions from the 1800’s have left a channelized system that needs to be managed
- What is being done now, what is the focus and where are the challenges

Stormwater – Regulating Development

- Ordinance Regulations
- Dyer continues to grow
- Water quality requirements

Stormwater Quality

- Identify point and non-point sources of pollution
- Develop programs to reduce stormwater pollutants and improve water quality

Water Quality Efforts

- Franciscan Health
- Parking lot expansion adjacent to Hart Ditch
- Direct discharge not allowed
- Filter Strip
Take Advantage of Existing Geological Conditions

Pheasant Hills Pond
- Water quality issues
- Bank erosion

Pheasant Hills Pond
- Bank stabilization
- Forebay

Pheasant Hills Pond
- Floating wetlands
Summary of Dyer’s Actions

➢ Recognized rainfall and runoff have both increased due to climate change and development. The increasing trend is going to continue. Can control Dyer’s actions but not the 36 mi² upstream.

➢ Updated Stormwater Ordinance regulations
➢ Water Quality and BMPs incorporated
➢ Regional storage in Illinois
➢ Education of Town staff, residents and developers
➢ Hart Ditch is naturalizing and adjusting its bed and banks to be able to convey the increased flow and sedimentation it is receiving.
➢ Adopt FEH Avoidance

Questions?