StormStore Feasibility Study

• Real Estate Demand Analysis
  – Identify situations where developers would have benefitted from or would have utilized offsite mitigation if it were available

• Land and Hydrological Analysis (“Opportunities Map”)
  – Identify where there are sites well-suited for detention or volume control

• Policy Analysis
  – Identify key features of other successful trading programs and primary issues to consider for an offsite stormwater control market in Cook County
Feasibility Study Team

- Metropolitan Planning Council, The Nature Conservancy, Metropolitan Water Reclamation District
  - Land & Hydrologic Analysis Consultant: Illinois State Water Survey
Preliminary Findings: demand analysis

• Analysis of past development projects indicates there would be substantial potential demand for offsite alternatives
  • roughly 17% of all projects permitted between 2006 and 2016 on sites under ten acres (132 of 764) could have used offsite to realize a net economic benefit of at least $20,000 or more
  • approximately 21% of all projects (197 of 928) would have benefitted if all sites including those over ten acres were able to make use of an off-site option

• The total economic benefit for the 197 projects that had a positive net benefit (> $20,000) was estimated in the model to be $47,407,095, with an average economic benefit per project of $240,645.
Demand for Offsite Options

Potential demand for offsite capacity was spread across the six watersheds in Cook County.

- **Cal-Sag Channel Watershed**: 14% of permits (< 10 acre sites)
- **Little Calumet River Watershed**: 17% of permits (< 10 acre sites)

Offsite area for stormwater mgt. (in each watershed): approximately 11 acres
Preliminary Findings: supply analysis

• Analysis of various land use, topography, and soil characteristics throughout Cook County
• Adequate surface area of potential sites to meet the potential demand
  • Potential sites in all the watersheds in Cook County
• Supply site types vary and are widely distributed at the 3+acre scale
Sites with Characteristics for Stormwater Controls

Potential supply sites were found in all the watersheds in Cook County.
Summary statistics showing area (acres) and volume (acre-feet) for a threshold of four or more coincident favorable layers.

<table>
<thead>
<tr>
<th>Watershed</th>
<th>Total Acres</th>
<th>Detention Acres</th>
<th>Detention Acre-Feet</th>
<th>Detention %</th>
<th>Volume Control Acres</th>
<th>Volume Control Acre-Feet</th>
<th>Volume Control %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calumet Sag Channel</td>
<td>96135</td>
<td>12103</td>
<td>48412</td>
<td>13%</td>
<td>5788</td>
<td>23152</td>
<td>6%</td>
</tr>
<tr>
<td>Lower Des Plaines River</td>
<td>120847</td>
<td>7614</td>
<td>30456</td>
<td>6%</td>
<td>5748</td>
<td>22992</td>
<td>5%</td>
</tr>
<tr>
<td>Little Calumet River</td>
<td>91403</td>
<td>14015</td>
<td>56060</td>
<td>15%</td>
<td>3388</td>
<td>13552</td>
<td>4%</td>
</tr>
<tr>
<td>North Branch Chicago River</td>
<td>90526</td>
<td>3548</td>
<td>14192</td>
<td>4%</td>
<td>1856</td>
<td>7424</td>
<td>2%</td>
</tr>
<tr>
<td>Poplar Creek</td>
<td>51580</td>
<td>8075</td>
<td>32300</td>
<td>16%</td>
<td>5215</td>
<td>20860</td>
<td>10%</td>
</tr>
<tr>
<td>Upper Salt Creek</td>
<td>35387</td>
<td>4038</td>
<td>16152</td>
<td>11%</td>
<td>3269</td>
<td>13076</td>
<td>9%</td>
</tr>
<tr>
<td>Total</td>
<td>485877</td>
<td>49393</td>
<td>137572</td>
<td>10%</td>
<td>25264</td>
<td>101056</td>
<td>5%</td>
</tr>
</tbody>
</table>
Policy Analysis

Research Plan

• Stormwater ordinance review of the following key factors:
  – Detention requirements; Volume control requirements
  – Off-site mitigation; Credit programs
  – Fee in lieu provisions
  – Climate change considerations

• Review of existing credit programs (Chattanooga, TN and Washington, D.C.) and relevant case studies noting the above factors as well as:
  – Policy driver(s)
  – Approval process of mitigation sites/credit sites
  – Length of credit & associated site life
  – Trading mechanism

• Assess other trading systems, wetland mitigation banking and carbon trading, to identify features that could provide insights for a stormwater credit system
Policy Analysis

Notable Issues, many for Further Investigation

• No Adverse Impact
• Spatial Proximity
• Criteria for credit sites
  – how a site earns/is awarded credits, and how credits are re-confirmed over time
• Timing considerations
  – initiation of operations at the development and credit site
  – timing of decision to use credits; timing of when supply credits are available
  – duration of credits
• The role of municipalities in a credits market in Cook County
• How to spark creation of credit sites to establish the market
• Equity considerations, e.g. how costs and benefits of the market would be distributed
HYPOTHETICAL DEMAND SCENARIOS
Demand Side Example – Small Lot Residential

Detention Requirement 423,600 gallons
Demand Side Example – Institutional (hospital)
Demand Side Example – Retail

<table>
<thead>
<tr>
<th>Type of Land Use</th>
<th>New Retail in Existing Shopping Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watershed</td>
<td>North Branch Chicago River</td>
</tr>
<tr>
<td>SPO or WMO</td>
<td>WMO</td>
</tr>
<tr>
<td>Combined or Separate</td>
<td>Combined</td>
</tr>
<tr>
<td>Site Area</td>
<td>1.05 Acres</td>
</tr>
<tr>
<td>Building Square Feet</td>
<td>5,000 SQ FT</td>
</tr>
<tr>
<td>New Impervious Surface Area</td>
<td>0.73 Acres</td>
</tr>
<tr>
<td>Existing Impervious Surface Area</td>
<td>0.90 Acres</td>
</tr>
<tr>
<td>Type of Detention</td>
<td>Existing Pond</td>
</tr>
<tr>
<td>Detention Volume</td>
<td>NA</td>
</tr>
<tr>
<td>Type of Green Infrastructure</td>
<td>Pipe</td>
</tr>
<tr>
<td>GI Volume</td>
<td>0.84 Ac Ft</td>
</tr>
<tr>
<td>Area Detained</td>
<td>1.05 Acres</td>
</tr>
</tbody>
</table>
Supply Side Example – School Retrofit

Site Type: Elementary School on South Side
Pre-Project Condition: Almost 100% impervious surfaces. Very little storage or infiltration

Post-Project Features:
• Improved features for students, including multi-purpose turf field, jogging track, two half-court basketball courts, play equipment for younger and older students
• Improved features for teachers: outdoor classroom areas, potential curriculum material about native plants and water
• Improved stormwater management: a cistern capturing roof runoff, a rain garden which provides volume control. Also a subsurface aggregate-filled storage area holding stormwater for gradual release to the combined sewer (i.e., detention)

Stormwater retention (volume control):
130,000 gallons
Approximate capital cost: $1.5 million
Cost shared equally between the three capital partners: CDWM, MWRD and CPS
Supply Side Example – Vacant Lot Retrofit - Detention

Site Type: Vacant Lot (owned by the Land Bank)
Pre-Project Condition: Mix of gravel and poor quality turf. Very little storage or infiltration

Post-Project Features:
• Park-like setting
• Unlined detention basis with flat slopes
• Trees and other vegetation
• Site will manage street runoff

**Stormwater detention:** 150,600 gallons
Estimated installation cost (excluding land): $20,000 (no engineered outlet)
Supply Side Example – Volume Control on Vacant Lots

Site Type: Vacant Lot
Pre-Project Condition: Mix of poor quality turf. Very little storage or infiltration
Post-Project Features:
• Garden-like setting
• Landscaped bioretention cell
• Trees and other vegetation
• Site will manage street runoff

Stormwater retention: 165,000 gallons
Estimated installation cost (excluding land): $30,000

(Garden will have a 30-inch-thick layer of engineered soil and a 2-foot-thick layer of gravel beneath the soil. Garden is designed to capture stormwater from the street and allow it to soak into the ground slowly over 24-72 hours)
Supply Side Example – GI ROW Rehab Program

Site Type: Right-of-Way (ROW) Improvement Project
- Municipal ongoing program to rehab residential streets
- Road Rehab Program’s already in place:
  - Partially funded from Motor Fuel Taxes (MFT)
  - Aging infrastructure: Sewers, water mains and utilities
- Enhance program to incorporate surplus detention and GI volume at intersections, alleys, or other GI streetscapes.
- Simple and substantial impervious runoff capture opportunity
- Clear and straightforward O&M when compared to private?

**Stormwater retention (volume control):** 34,000 gallons
Discussion Questions

• How do you see this opportunity playing out in the Calumet region?

• Do you know of any projects that could be candidates for supply or demand sites?

• Do you see a role for your organization participating in this market?

• What barriers do you foresee? What strategies might be suitable to overcome them?