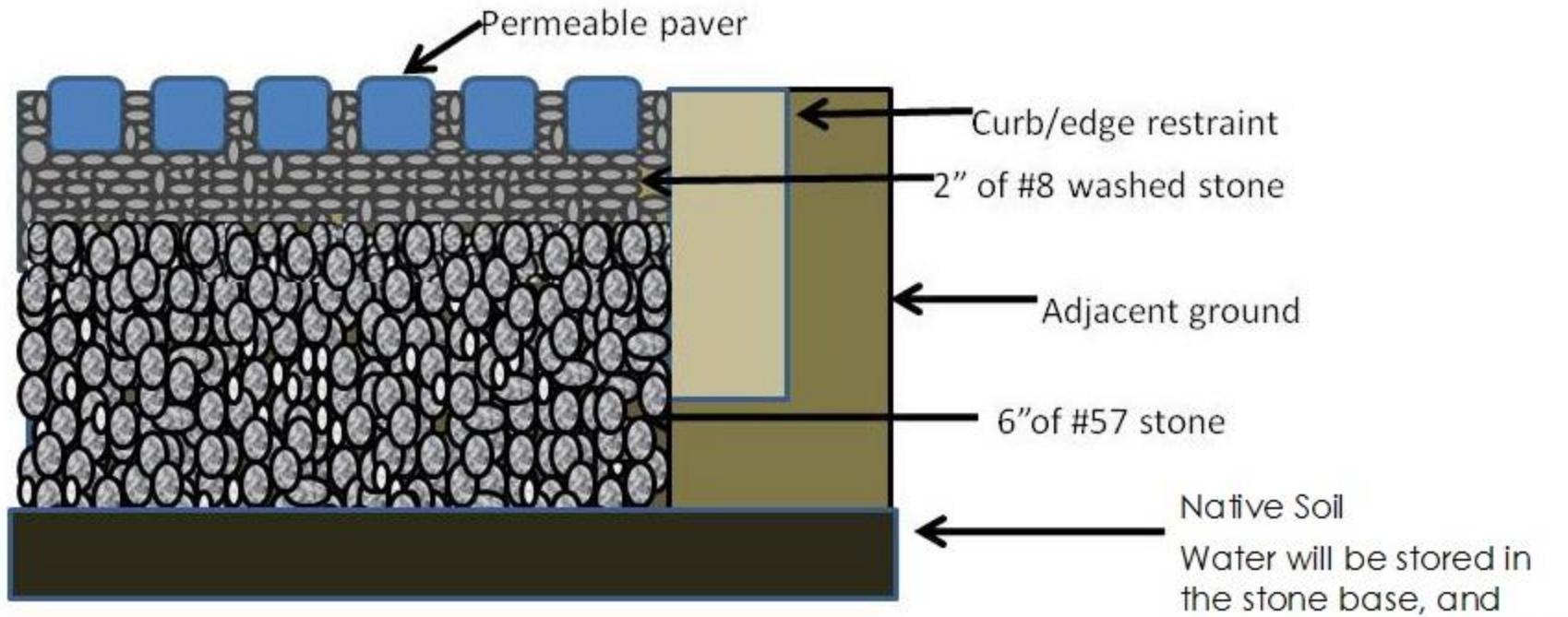
MWRD

- In the next five years or so MWRD will more than quadruple its current CSO storage capacity
- Implementation of GI Plan
  - Using Design Retention Capacity as the Metric for Gauging Implementation



MWRD – Green Infrastructure

Green Infrastructure Plan

- Establishing Partnerships and Collaboration with Other Stakeholders
- Public Participation
- Geographic Coverage/Decision Criteria
- Preservation of Constructed Green Infrastructure Projects

MWRD – Green Infrastructure

Geographic Coverage/Decision Criteria (prioritization scheme)

(1) Green Infrastructure control measures will help reduce flooding and basement backups;

(2) Land ownership will readily accommodate permanent GI control measures and maintenance, such as areas where vacant parcels can be retrofitted into “stormwater parks,” which would store and infiltrate or reuse rainfall and runoff and also be an amenity for local residents; and

(3) Green Infrastructure control measures can improve socio-economic conditions in the service area, with the highest priority given to neighborhoods where the need for improvement is greatest.

MWRD – Green Infrastructure

MWRD, by itself or in collaboration with other stakeholders, will complete Green Infrastructure projects within its service area that are identified in accordance with the Plan

Example – Milwaukee Metropolitan Sewerage District

- The District, working with partners as appropriate, will ensure that green infrastructure practices are put in place in the MMSD service area.
  - Each year - 1 million gallons of design retention capacity.
  - Up to 75% of the total green infrastructure retention capacity requirement can be met through capture at GreenSeams® parcels.
  - At least 25% of the green infrastructure retention capacity requirement must be met through implementation of rain gardens, permeable pavement, bioswales, etc.
- Any green infrastructure practices/control measures that are put in place must be maintained.

Example – Milwaukee Metropolitan Sewerage District

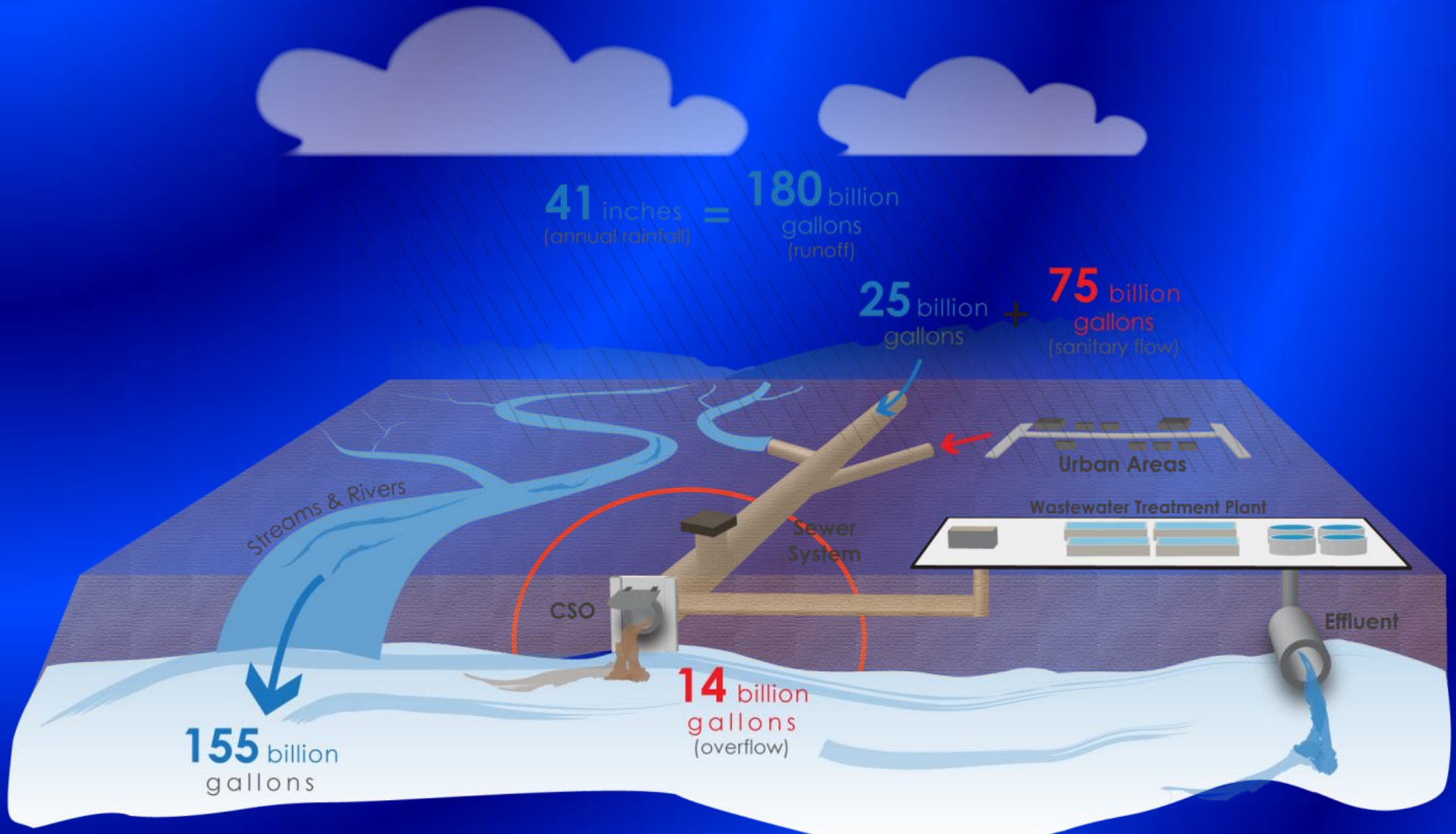
- MMSD issued two requests for proposals from entities in the service area.
- The District reviewed proposals and selected projects to be supported
- Total gallons excluding GreenSeams® parcel acquisitions: **3,865,000**
- Total gallons including parcel GreenSeams® acquisitions: **10,020,000**
- Includes 8 Green Roofs projects
- Includes 13 projects for Rain Gardens, Permeable Pavements, Bioswales, etc.

Example – Milwaukee Metropolitan Sewerage District

Sampling of MMSD Green Infrastructure Partners (2013)

- **Six Points Farmers Market**
- **Bradley Road Median**
- **All Peoples Church**
- **St. Ann Inter-Generational Center**
- **UWM Sandburg Commons Gardens**
- **City DPW Yards**

Cincinnati's Environmental Challenge



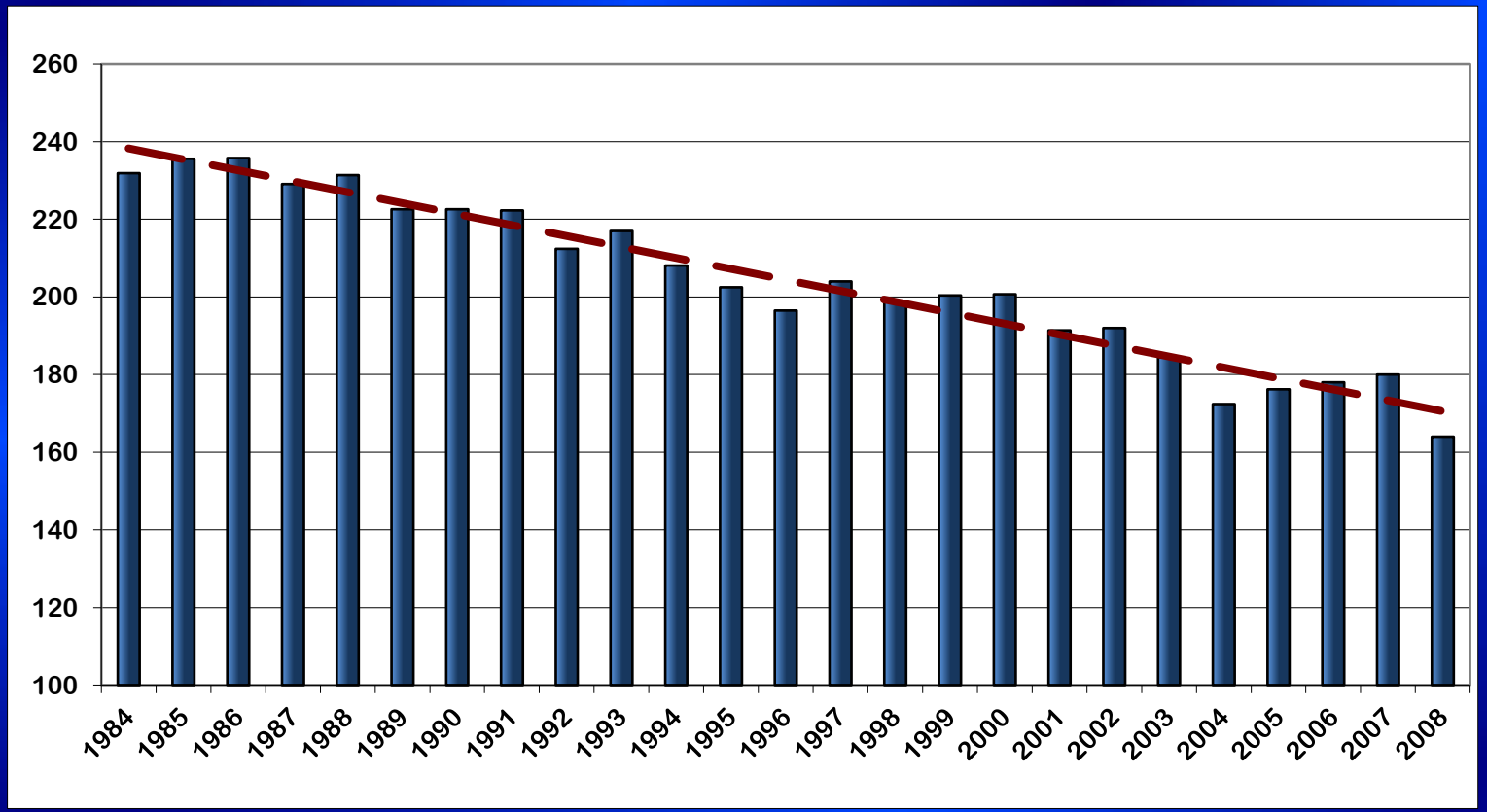
MSDGC is among the Top 5 CSO dischargers in the US

Graphics Courtesy of MSDGC

MSD Economic Challenges

Maintaining affordability of residential usage

Declining usage per account



Sustainable Infrastructure Planning

Source Control - Stormwater offloading through:

- ***Strategic sewer separation (natural conveyance and storm sewers)***
- ***Bioretention or detention***
- ***Stream restoration***
- ***Stream daylighting***
- ***Green infrastructure***
  - ***Rain gardens***
  - ***Rain barrels***
  - ***Reforestation***
  - ***Pervious pavements***

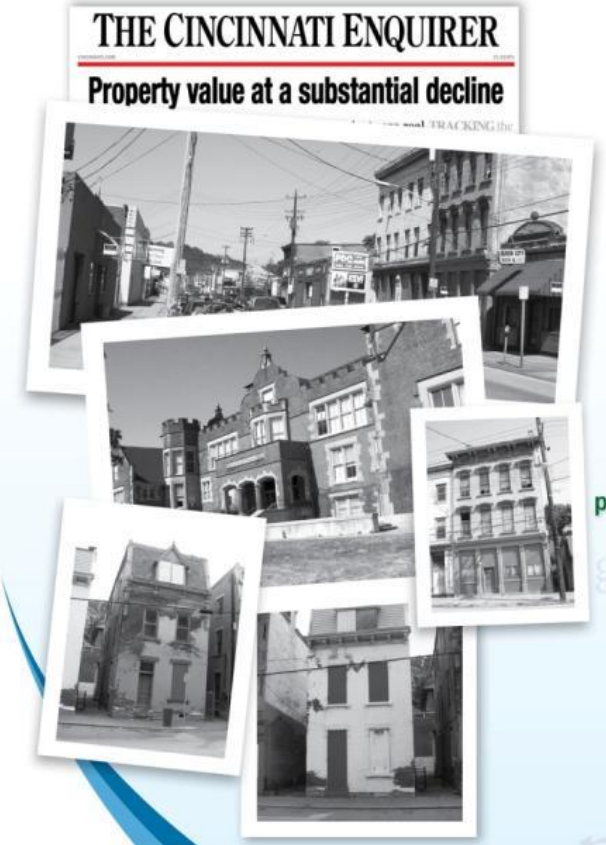
Prevalence of Foreclosed Properties

Graphics Courtesy of MSDGC

Current Conditions in the Community

Leverage MSD's Investment

Community's Vision for the Future



MSD

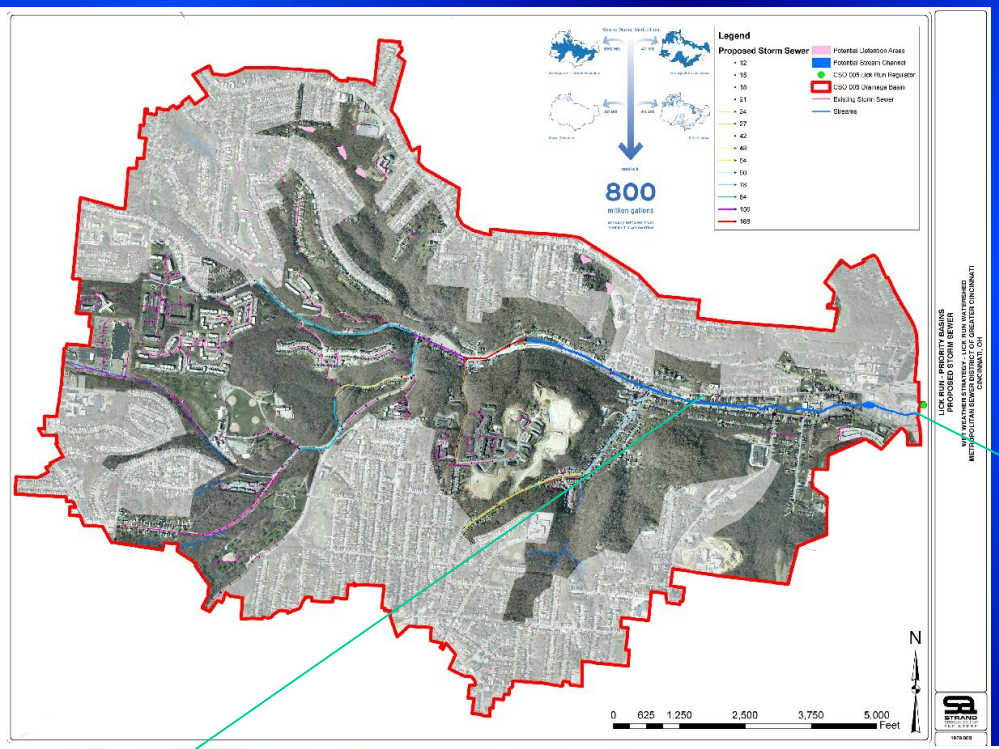
Metropolitan Sewer District

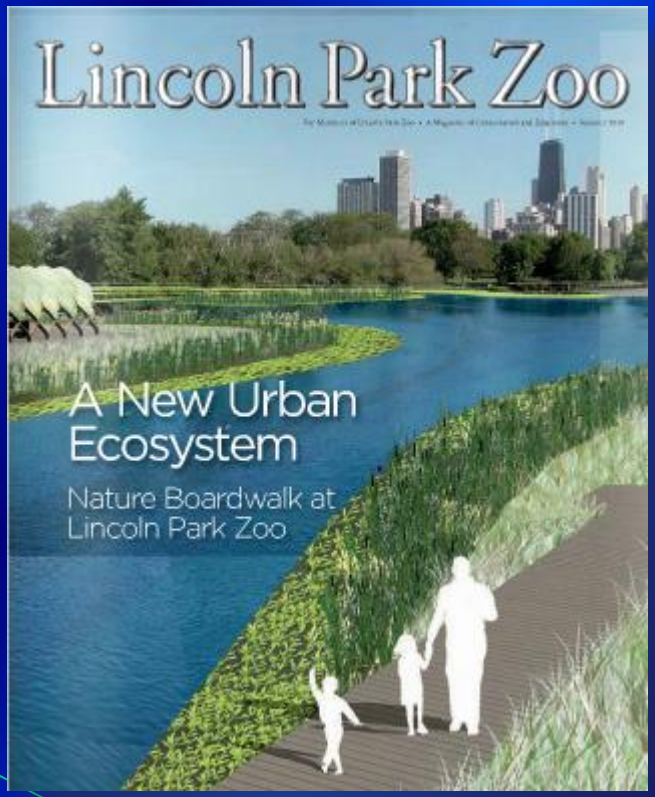
Investment to reduce sewer overflows and meet federal mandates

economics
infill
sustainability
jobs
smart growth
bike trails
safety
recreational
opportunities
better
community
gardens
education
quality place
community assets

METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Lick Run: Sustainable Infrastructure Alternative





Graphics Courtesy of MSDGC

Cincinnati CSO Program
Lower Mill Creek Service Area

- **Default solution: Tunnel**
- **Alternative solution: Keep water out of the system and "right size" grey infrastructure components**
- **Reduction in CSOs: 1.78 billion gallons**
  (in a typical year, for these sewersheds)
- **Costs**
  - ***Default: $414.4 million*** ***(2006 dollars)***
  - ***Alternative: $244.3 million*** ***(2006 dollars)***

Inform & Influence

Communities of the Future Advisory Committee

- Sierra Club
- Mill Creek Restoration Project
- Community Building Institute – Xavier University
- University of Cincinnati
- Local Initiative for Support Corporations (LISC)
- OKI Regional Council of Governments
- Chamber of Commerce Agenda 360
- US Green Building Council

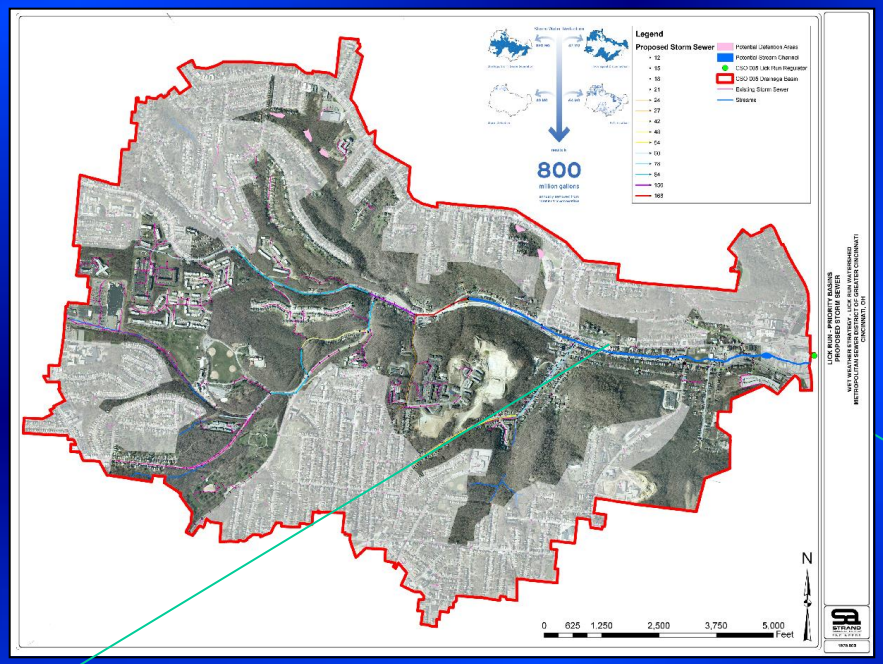
- Green Partnership of Greater Cincinnati
- Cincinnati Preservation
- NRMRL, USEPA
- Ohio EPA
- Port Authority of Greater Cincinnati
- Cincinnati Park Board
- City & County Departments

Graphics Courtesy of MSDGC

How many problems can a community solve for $3 billion?

- **Conventional CSO Tunnel: Reduces sewer overflows to rivers**
- **Land-Based Storm-Water Mgmt Strategies:**
  - ***Reduce sewer overflows to our rivers***
  - ***Create green space and parks,***
    urban land restoration,
    mitigate global climate change, reduce heat islands,
    resilience,
    improve quality of life,
    water conservation, energy use,
    education, recreation,
    riparian buffers, flood control, access, unimpaired streams.
- **How to make theory into reality?**

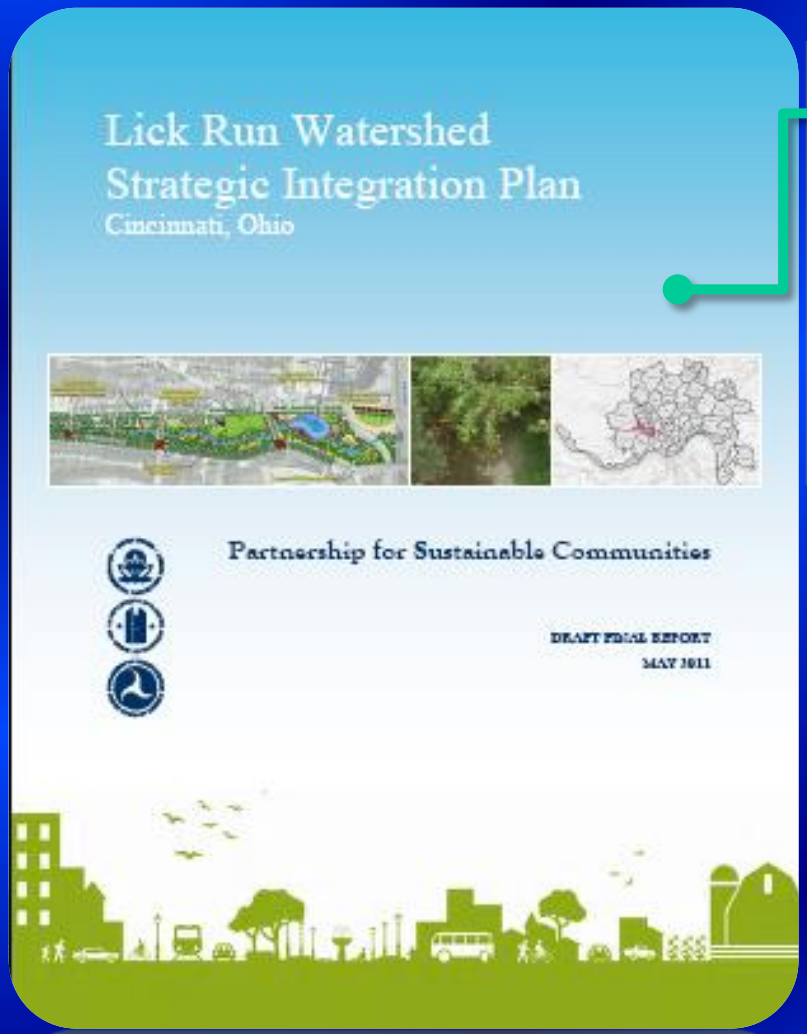
EPA Region 5 Community Based Approach



- Brownfields Phase I Site Assessments (TBA)
- OBLR-funded Community Revitalization Strategy
- Demolition/Deconstruction
- Coordinate ORD involvement
- Sustainable Communities

Graphics Courtesy of MSDGC

Lick Run Watershed: Integration Strategy



3.4 Framework Action #3: Cincinnati Parks Coordination (Ongoing)

Goal:	Continue to update and work through the MOU between MSD and Cincinnati Parks to accomplish planning and implementation of the Sustainable Infrastructure Program and improve neighborhood open space and park resources.
Opportunity:	Provide a model for cooperative maintenance, funding and upkeep of distributed stormwater source control and treatment; provide "green jobs" opportunities and training once projects are implemented.
Lead responsibility:	MSD and Cincinnati Parks.
Additional agencies:	Mill Creek Restoration; HUD Neighborhood Stabilization; Cincinnati Schools.
Timeframe:	First MOU expires December 30, 2012; MOU Renewal for 2013 – 2015.

Recommendations:

- Develop a scope for the Lick Run Watershed Plan, as part of the LDC update that makes implementation of the Sustainable Infrastructure Program a principal goal and brings together the Framework Actions identified in this Plan.

GREENING Cincinnati

QUICK LINKS

OES Home

Cincinnati Recycles

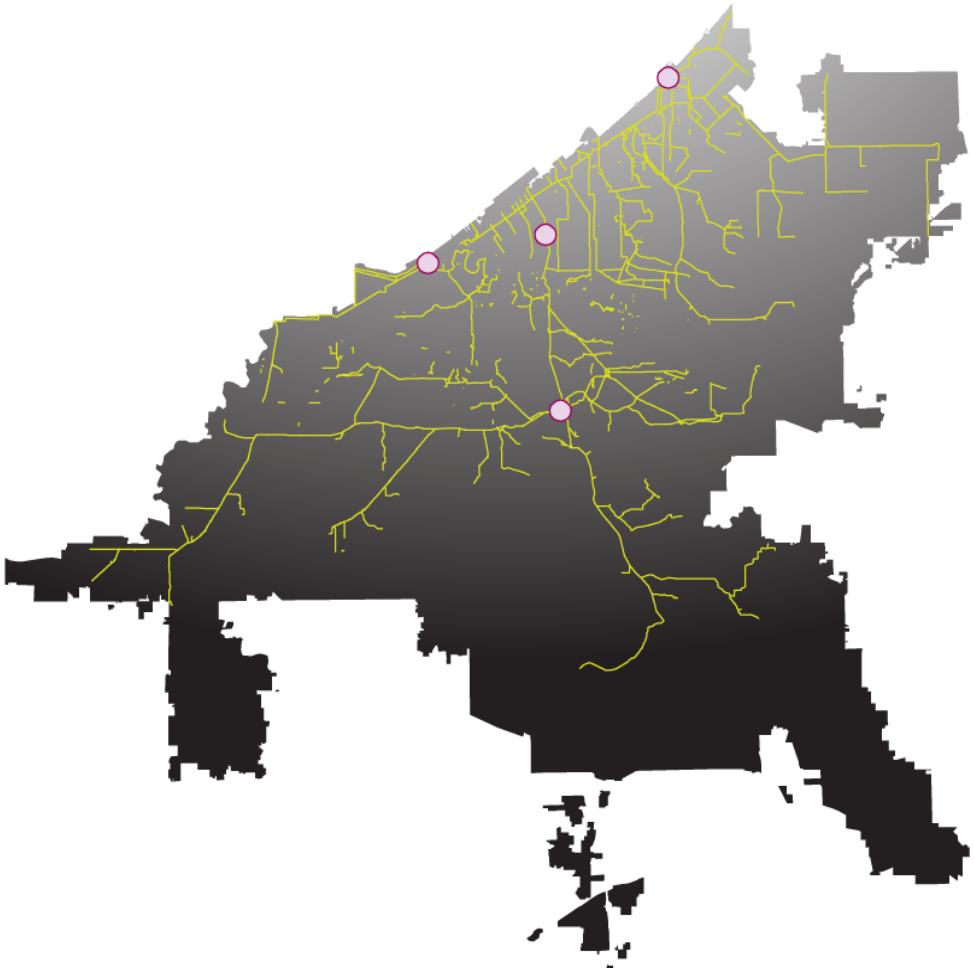
Green Umbrella

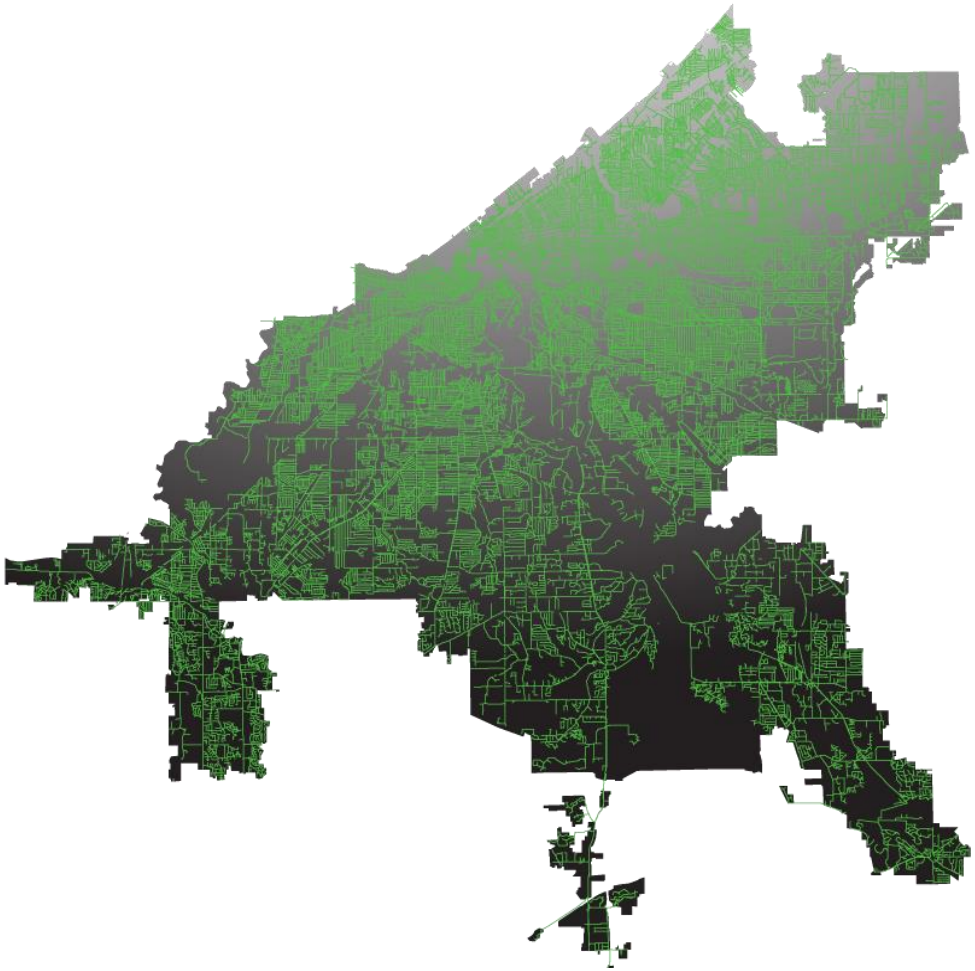
Green Partnership

Unbuilding/Rebuilding South Fairmount

The Metropolitan Sewer District of Greater Cincinnati (MSD) demolished 21 residential and commercial buildings in South Fairmount this summer as part of the Lick Run project.

Northeast Ohio Regional Sewer District



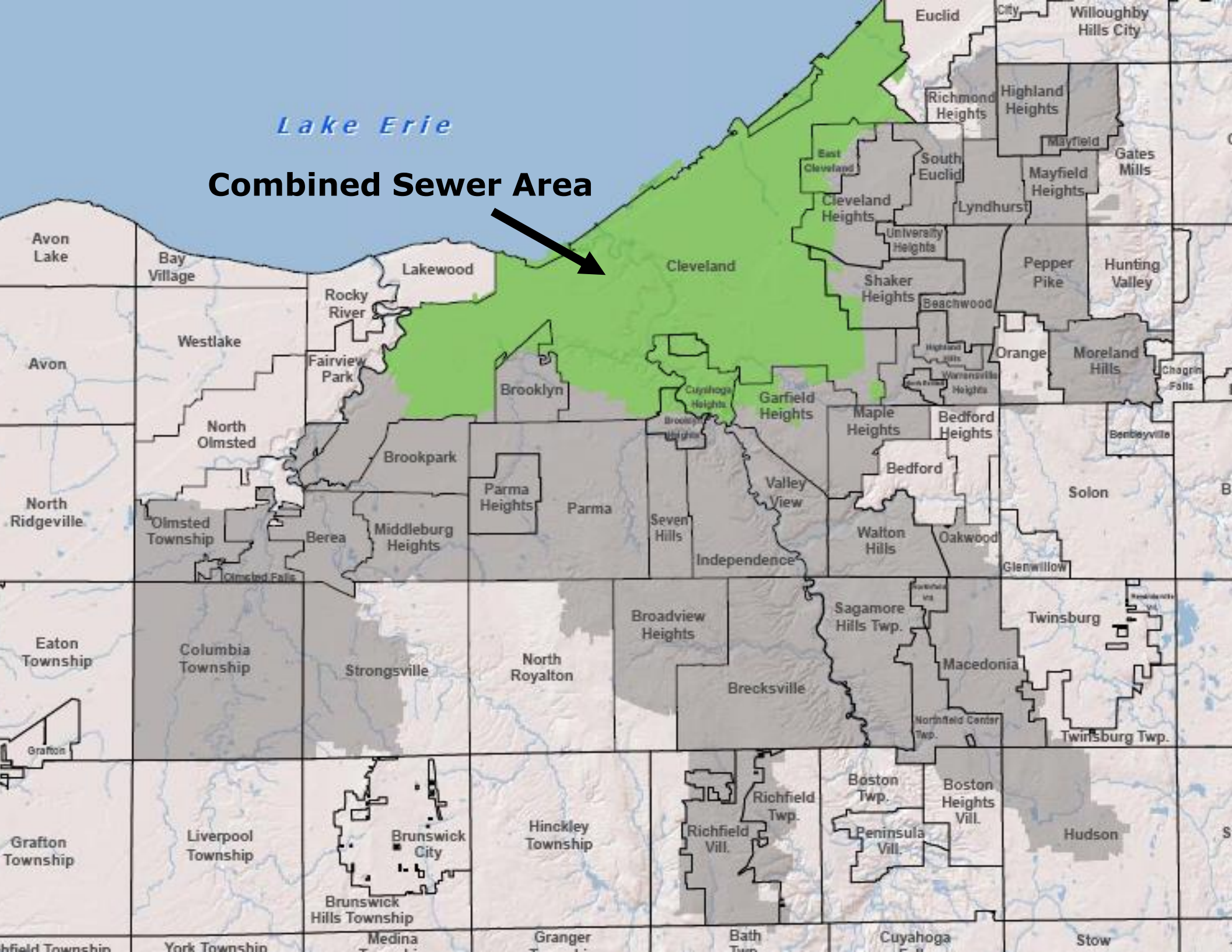


312 miles

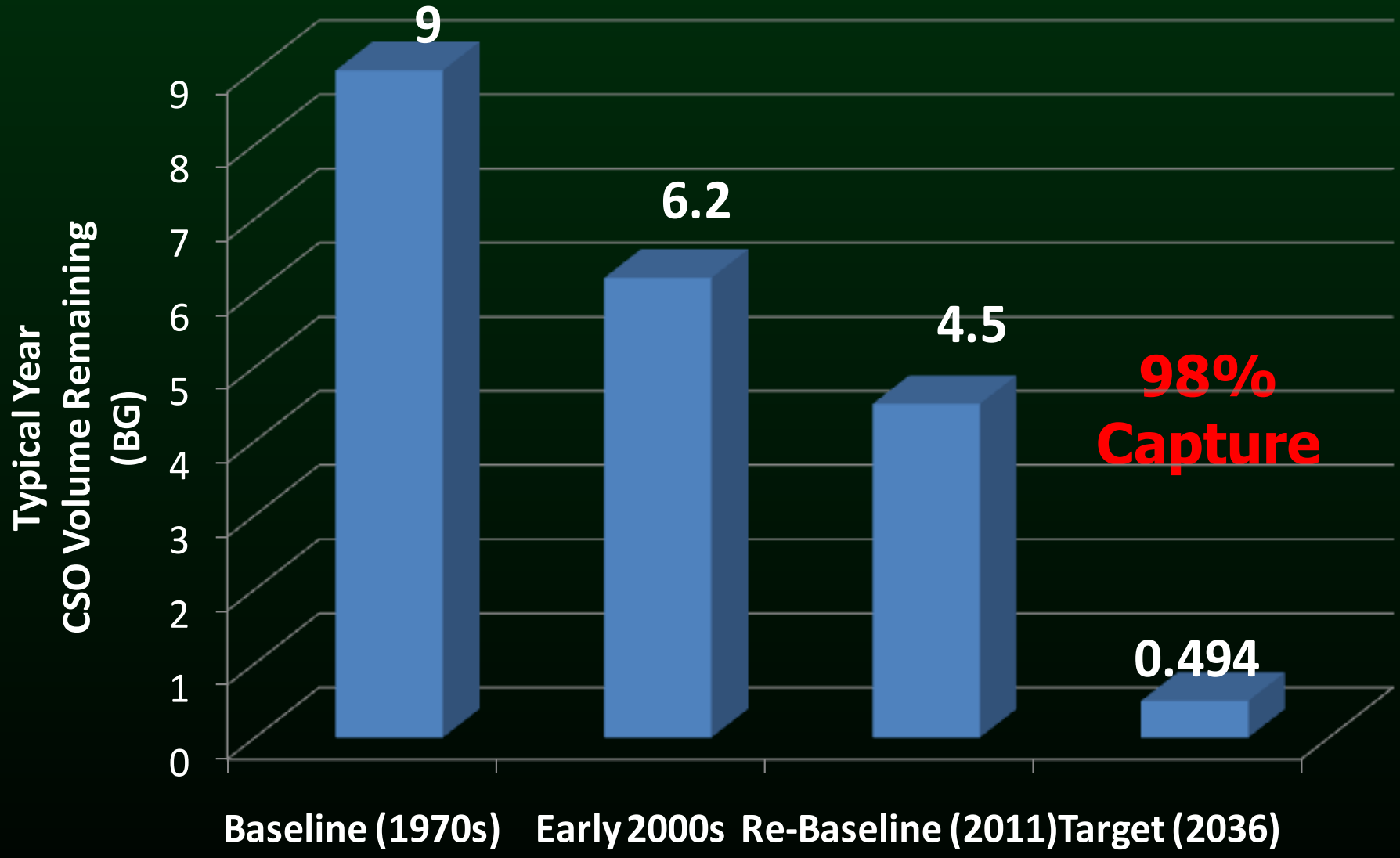
Total length of District-owned sewers and interceptors

3,107 miles

Total length of locally-owned sewers and interceptors


Lake Erie
Combined Sewer Area
Euclid
Willoughby Hills City
Richmond Heights
Highland Heights
Mayfield
Gates Mills
East Cleveland
South Euclid
Mayfield Heights
Cleveland Heights
Lyndhurst
University Heights
Avon Lake
Bay Village
Lakewood
Cleveland
Pepper Pike
Hunting Valley
Rocky River
Shaker Heights
Beachwood
Westlake
Avon
Fairview Park
Brooklyn
Orange
Moreland Hills
Chagrin Falls
Cuyahoga Heights
Garfield Heights
Maple Heights
Bedford Heights
North Olmsted
Brookpark
Bentleyville
Bedford
Parma Heights
Parma
Valley View
Solon
North Ridgeville
Olmsted Township
Berea
Middleburg Heights
Seven Hills
Walton Hills
Oakwood
Independence
Glenwillow
Olmsted Falls
Broadview Heights
Sagamore Hills Twp.
Twinsburg
Eaton Township
Columbia Township
Strongsville
North Royalton
Macedonia
Brecksville
Northfield Center Twp.
Twinsburg Twp.
Grafton
Boston Twp.
Boston Heights Vill.
Richfield Twp.
Grafton Township
Liverpool Township
Brunswick City
Hinckley Township
Richfield Vill.
Peninsula Vill.
Hudson
Brunswick Hills Township
Medina
Granger
Bath
Cuyahoga
Stow
York Township

EPA Requires Northeast Ohio's CSO Problem Reduced in 25 Years

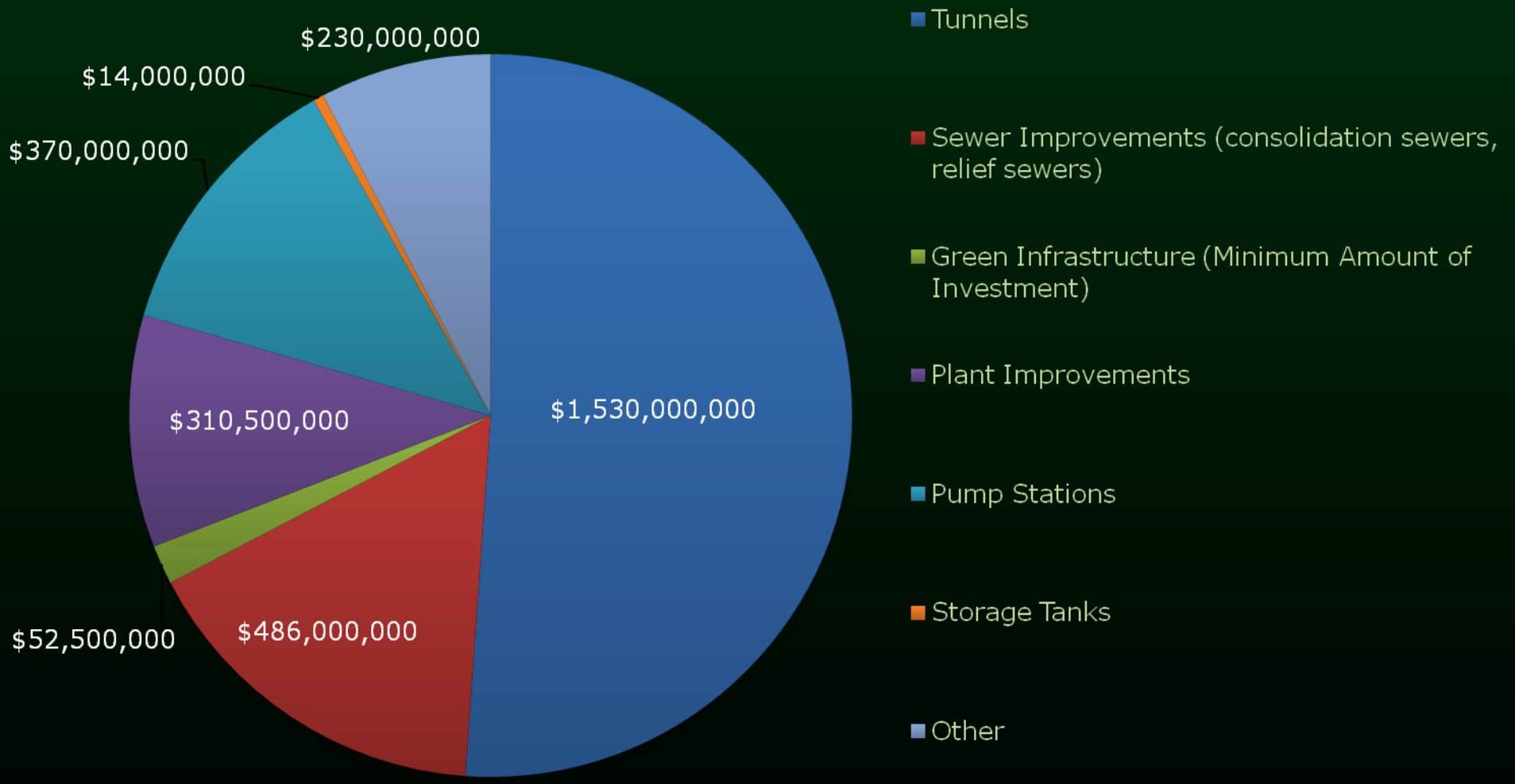


Your Sewer District Keeping our Great Lake great.

#ProjectCleanLake

CSO Consent Decree

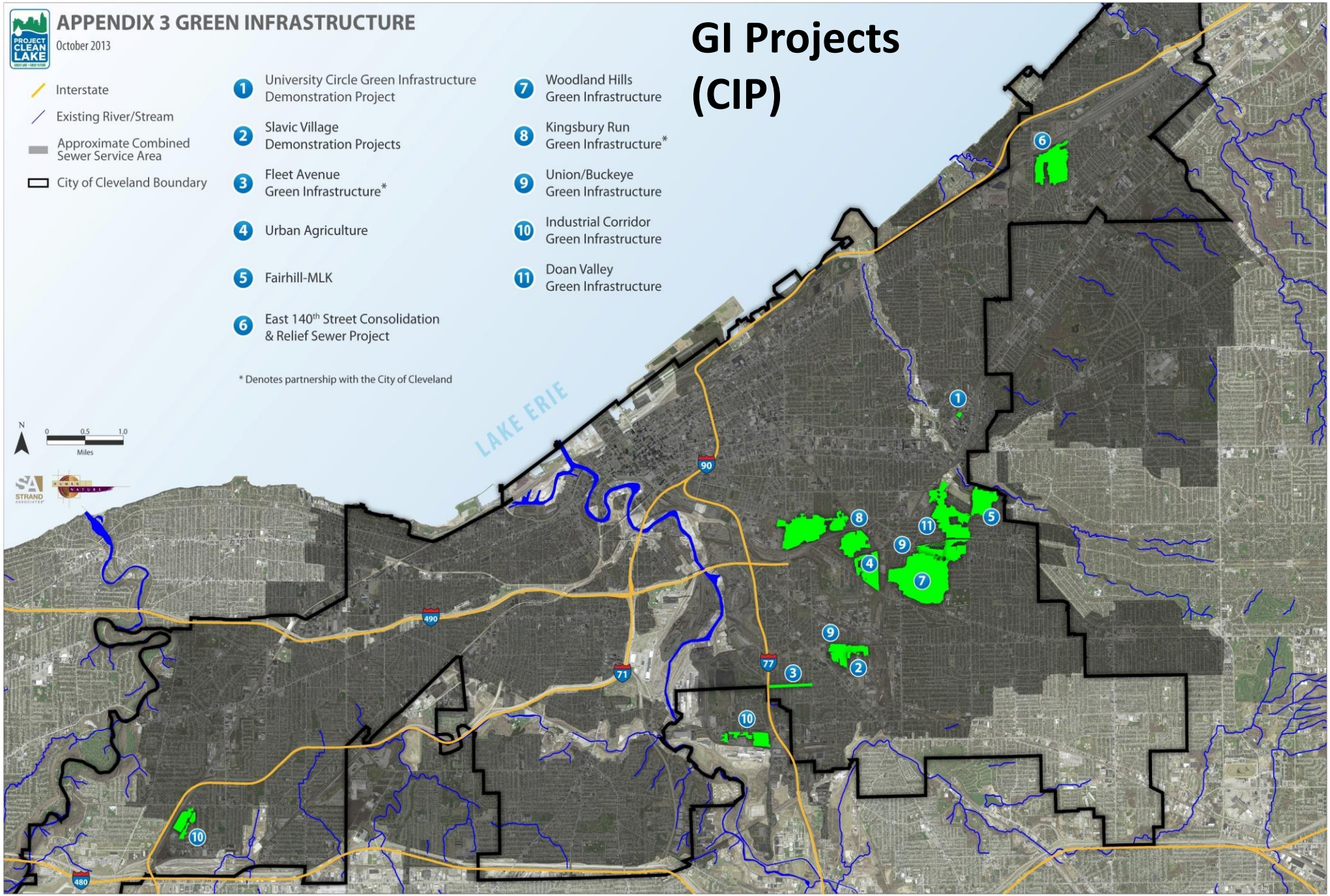
$3B Capital Investment in CSO Control Measures over 25 Years



Your Sewer District **Keeping our Great Lake great.**

#ProjectCleanLake

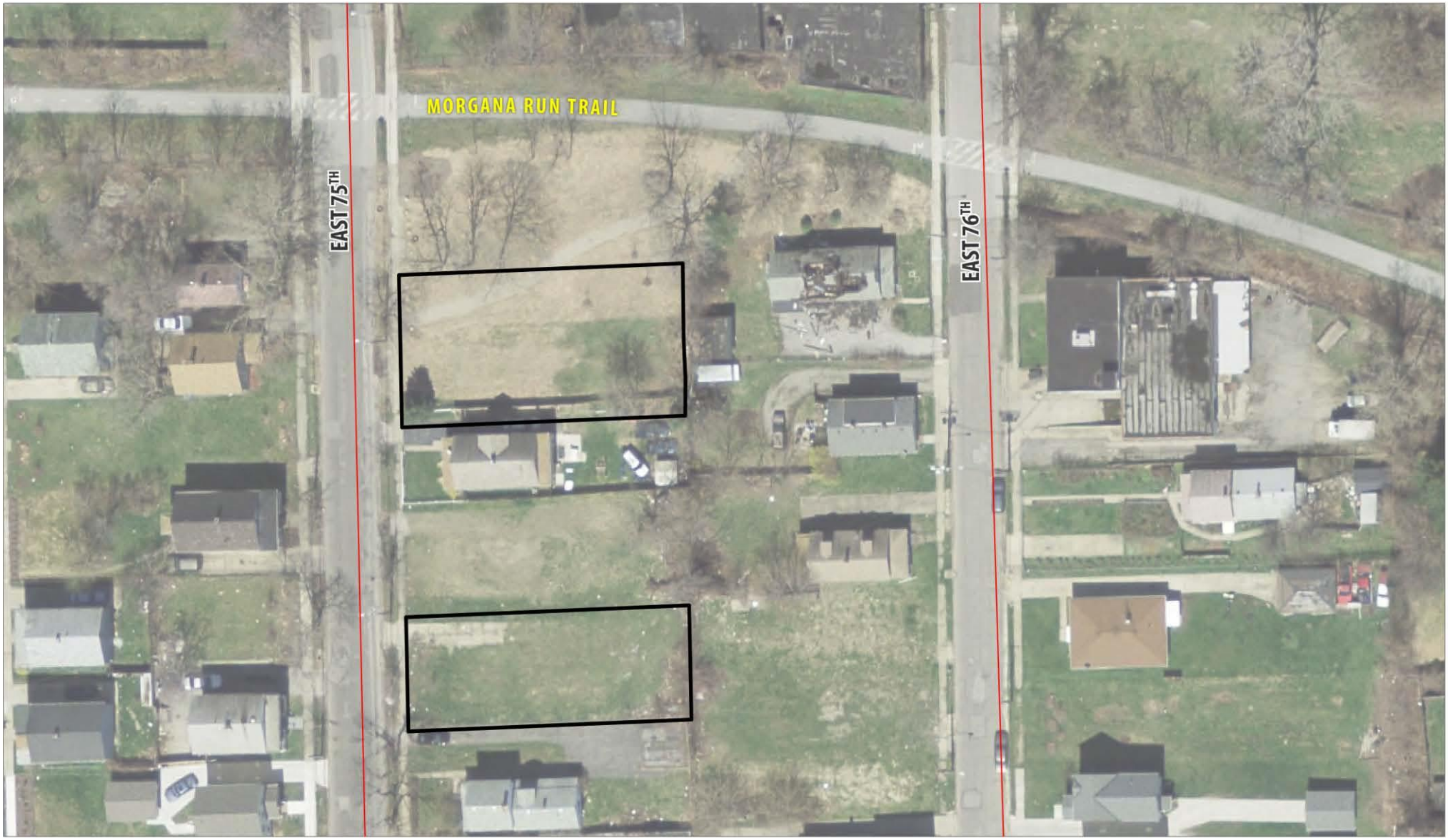
GI Projects (CIP)



NEORSD: CSO CONTROL CONSENT DECREE

Sampling of GI Projects

East 75th Street Bioretention Features



N

0 20 40

Feet

Legend

- Existing Combined Sewer
- Project Area Boundary

DATA SOURCES: NEORSD

NORTHEAST OHIO REGIONAL SEWER DISTRICT

GREEN INFRASTRUCTURE AMBASSADOR PROJECTS

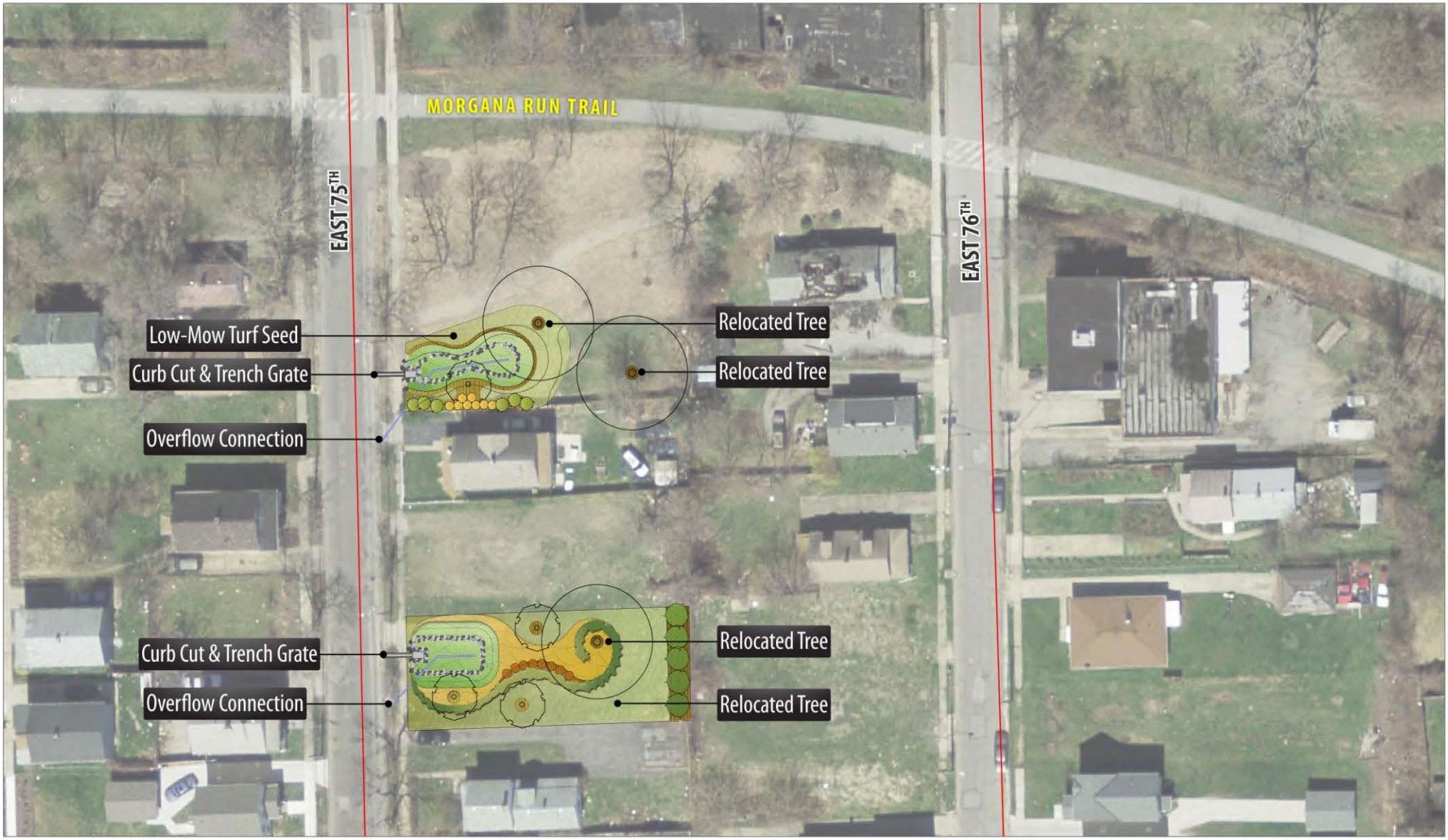
SLAVIC VILLAGE EAST 75TH STREET BIORETENTION FEATURES

HUMAN NATURE

STRAND ASSOCIATES®

GREEN INFRASTRUCTURE DESIGN • **SEPTEMBER 2013** • PRELIMINARY DRAFT FOR DISCUSSION PURPOSES ONLY

East 75th Street Bioretention Features



N

0 20 40

Feet

Legend

Existing Combined Sewer

DATA SOURCES: NEORSD

NORTHEAST OHIO REGIONAL SEWER DISTRICT

GREEN INFRASTRUCTURE AMBASSADOR PROJECTS

SLAVIC VILLAGE EAST 75TH STREET BIORETENTION FEATURES

HUMAN NATURE

STRAND ASSOCIATES

East 75th Street Bioretention Feature South (before construction)

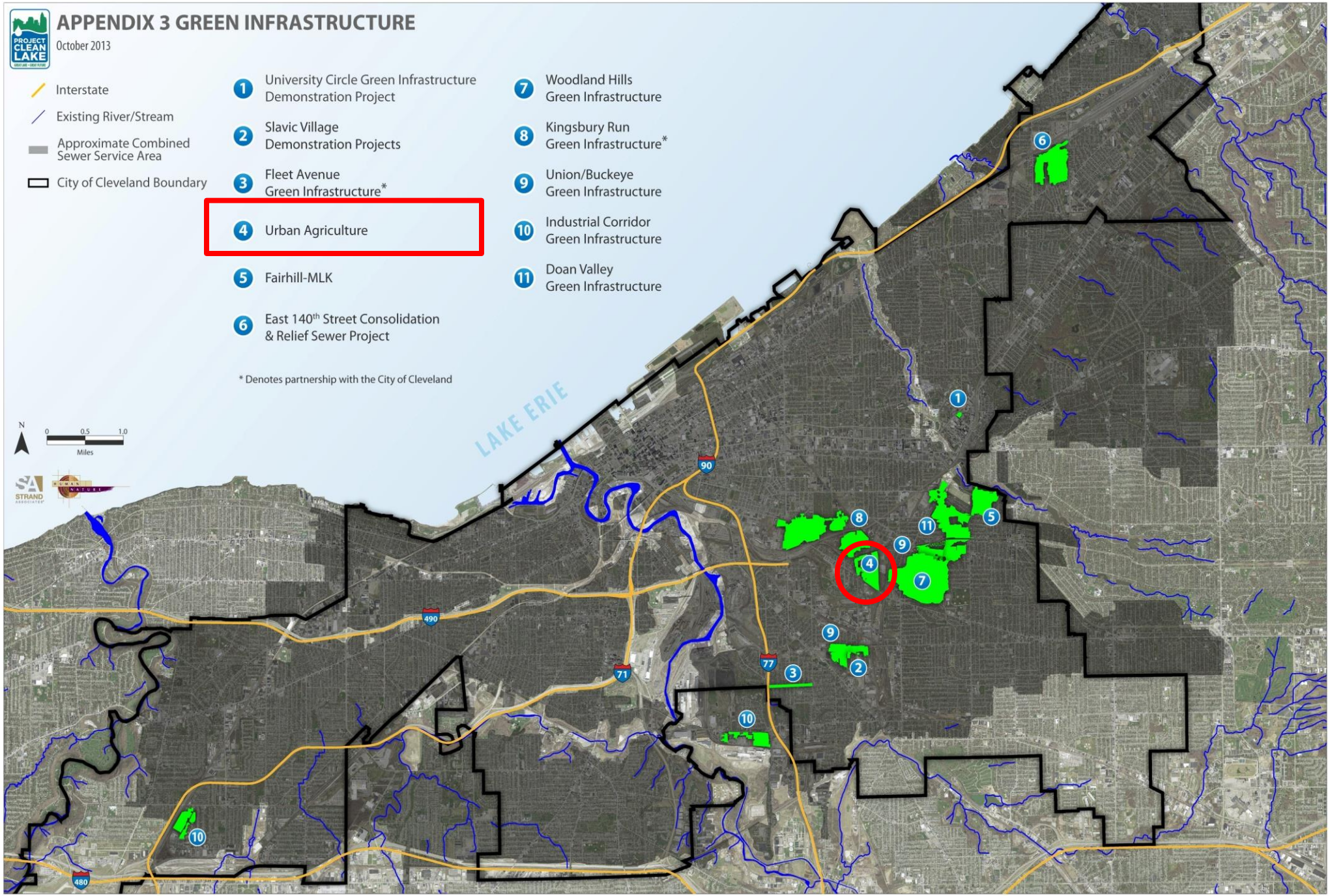
East 75th Street Bioretention Feature South (approximately three years after construction)

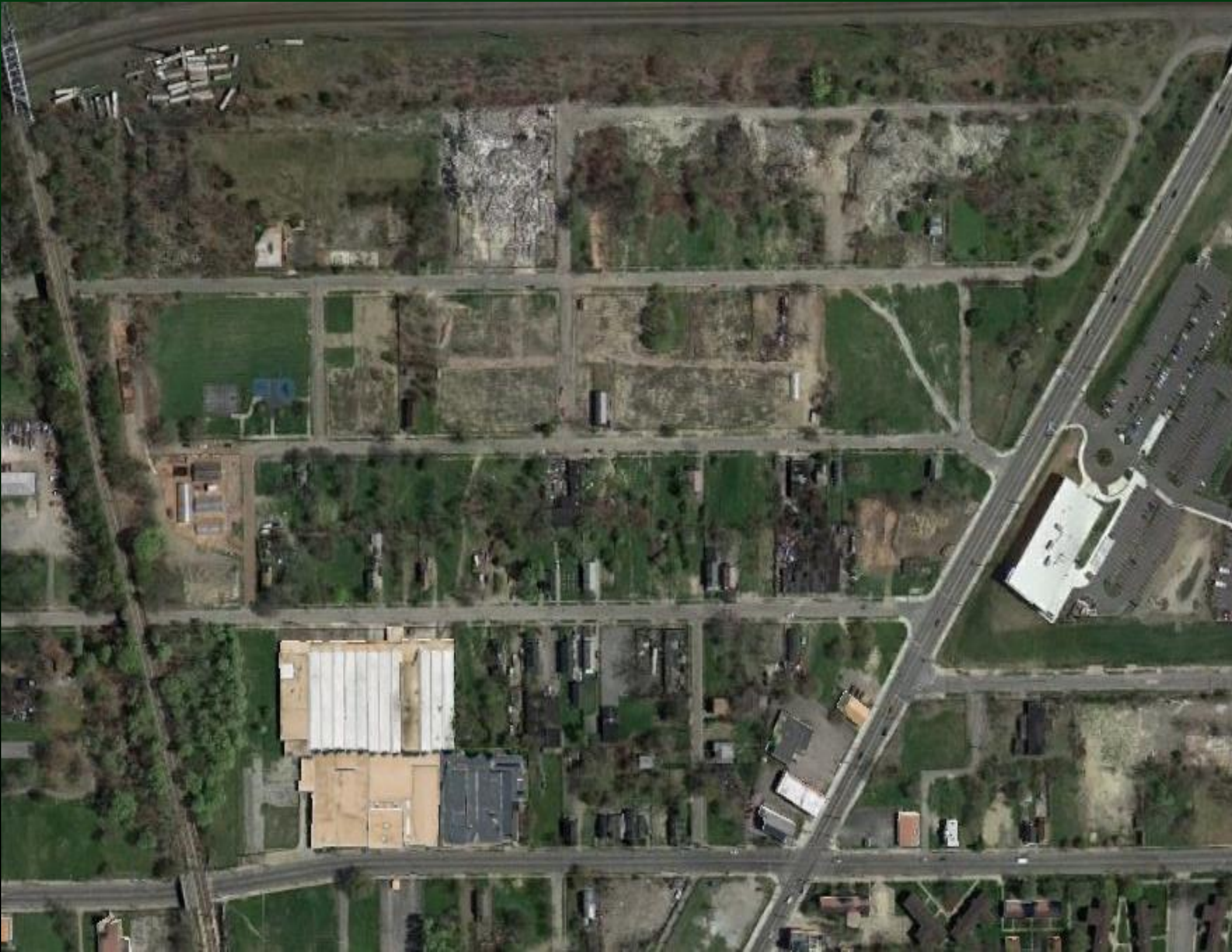
East 75th Street Bioretention Feature North (before construction)

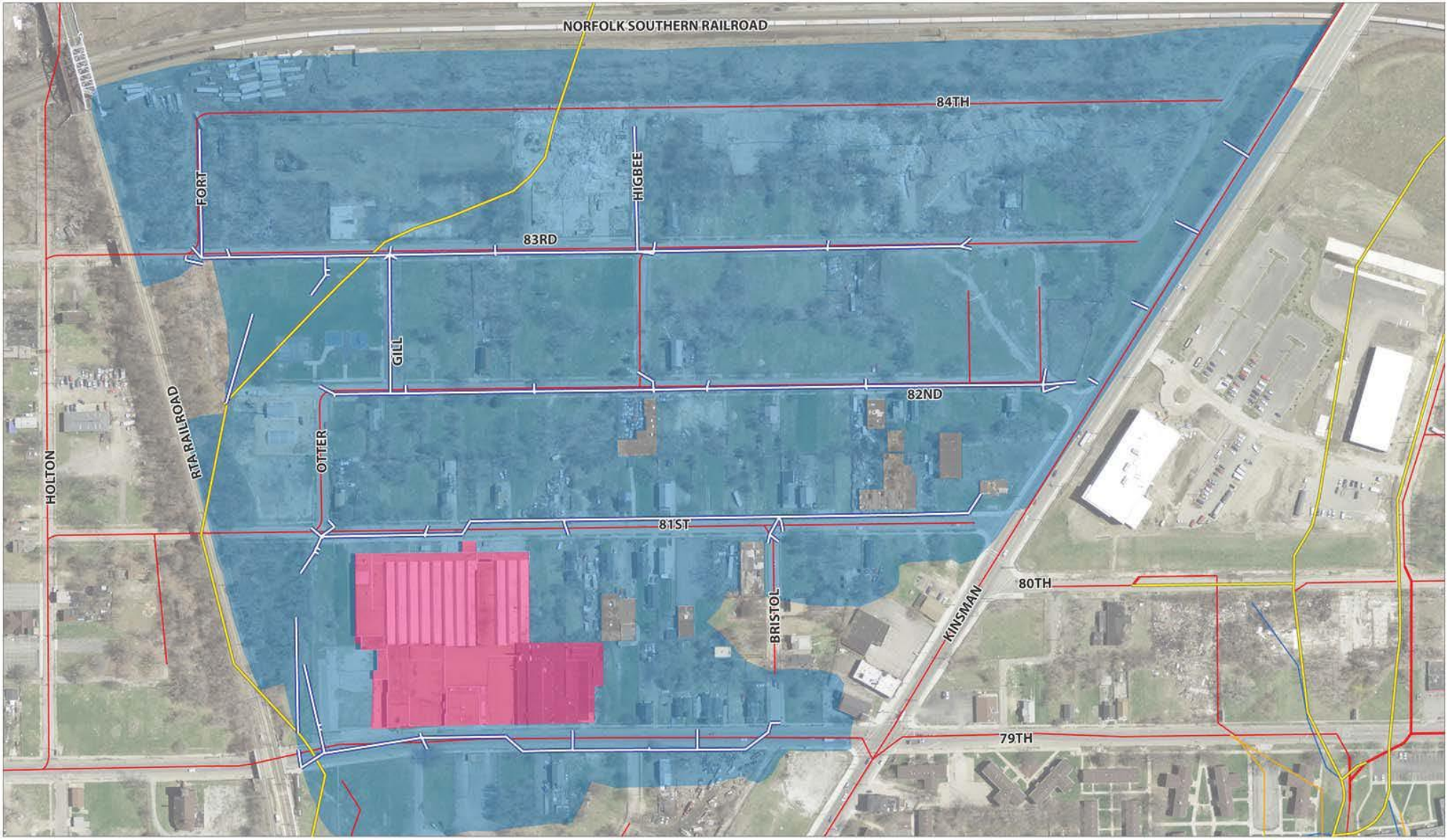
East 75th Street Bioretention Feature North (approximately three years after construction)

APPENDIX 3 GREEN INFRASTRUCTURE

October 2013







DATA SOURCES: NEORSD

N

0 100 200
Feet

Legend

- Combined Sewer
- Sanitary Sewer
- Storm Sewer
- SWO Sewer
- Proposed Storm Sewer
- Drainage Area (Modeled Benefit)
- Drainage Area (Potential Benefit)

NORTHEAST OHIO REGIONAL SEWER DISTRICT

EARLY ACTION PROJECTS

URBAN AGRICULTURE EAP DRAINAGE AREA

HUMAN NATURE

STRAND ASSOCIATES®

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DATA SOURCES: NEORSD

N

0 100 200
Feet

Legend

- SWO Sewer (Kingsbury Run Branch Culvert)
- Proposed Storm Sewer

NORTHEAST OHIO REGIONAL SEWER DISTRICT

EARLY ACTION PROJECTS

URBAN AGRICULTURE EAP CONCEPT

HUMAN NATURE

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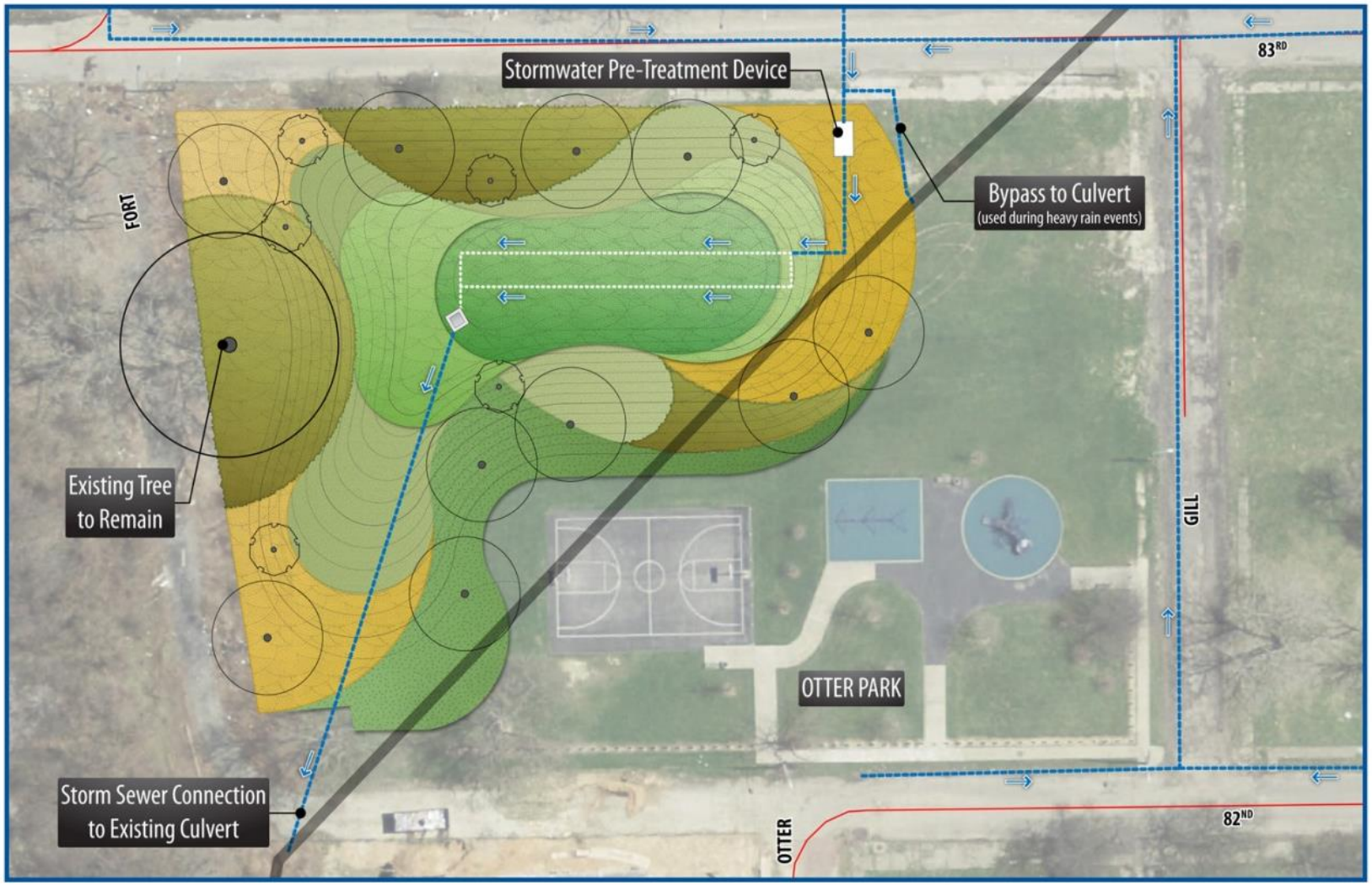

GREEN INFRASTRUCTURE AMBASSADOR PROJECT

PROJECT CLEAN LAKE

EXAMPLE PLANT & TREE SPECIES

EXISTING CONDITIONS

EXISTING CONDITIONS

Consent Decree GI Requirements

Implementation Obstacles and Challenges

- Ratio of stormwater capture to CSO Control
- Maintenance, control in perpetuity
- Limited locations to discharge into stormwater system
- Topography, soils including contaminated sites
- Ownership, partnerships, and control

Possible CMAP Roles

Green Infrastructure Planning Phase

- Convening and marketing
- Assemble GI projects from LTA
- Review planned capital projects for GI opportunities
- Staff GI liaison(s)
- Identify funding leverage options
- Go to 2040 plan implementation