



City of Park Ridge



September 11, 2017

Stormwater Master Plan Overland Flooding Projects



Purpose of Tonight's Presentation

- Discuss Overland Flooding Areas & Projects
- Determine Proposed Level of Protection



Level of Protection (LOP)

To develop the Stormwater Master Plan, we need direction on what the desired Level of Protection (LOP) from flooding will be.

(Higher LOP = Higher Cost \$\$)



Level of Protection (LOP)

Need to consider LOP for 2 types of flooding –

~~Sewer Backup~~ and Overland Flooding

Discussed in 6/12/17
presentation



Overland Flooding

Overland Flooding occurs when the sewer capacity is exceeded and surface runoff enters a structure through an opening such as door, window well, etc:



Level of Protection Determination

From 6/12/17 Presentation

- Major storm events since the Citywide Sewer Study was completed give us the opportunity to refine (calibrate) the sewer model built previously

Storm Event	Rainfall Depth & Duration	Approximate Recurrence Interval
April 2013	5.4" in 24 hours	25-year
June 2013	3.3" in 3 hours	25-year

- Model was run for these two events and the results were compared to flooding descriptions and photos from flood questionnaires



Model Calibration

From 6/12/17 Presentation

3D Model of Northwest Park area generated from aerial drone footage:



Model Calibration

From 6/12/17 Presentation



Photo from 4/18/13 Flood Event



Model Simulation of 4/18/13 Flood Event



Model Calibration

From 6/12/17 Presentation

3D Model of Greenwood/NW Hwy area generated from aerial drone footage:



Model Calibration

From 6/12/17 Presentation



Photo from 4/18/13 Flood Event

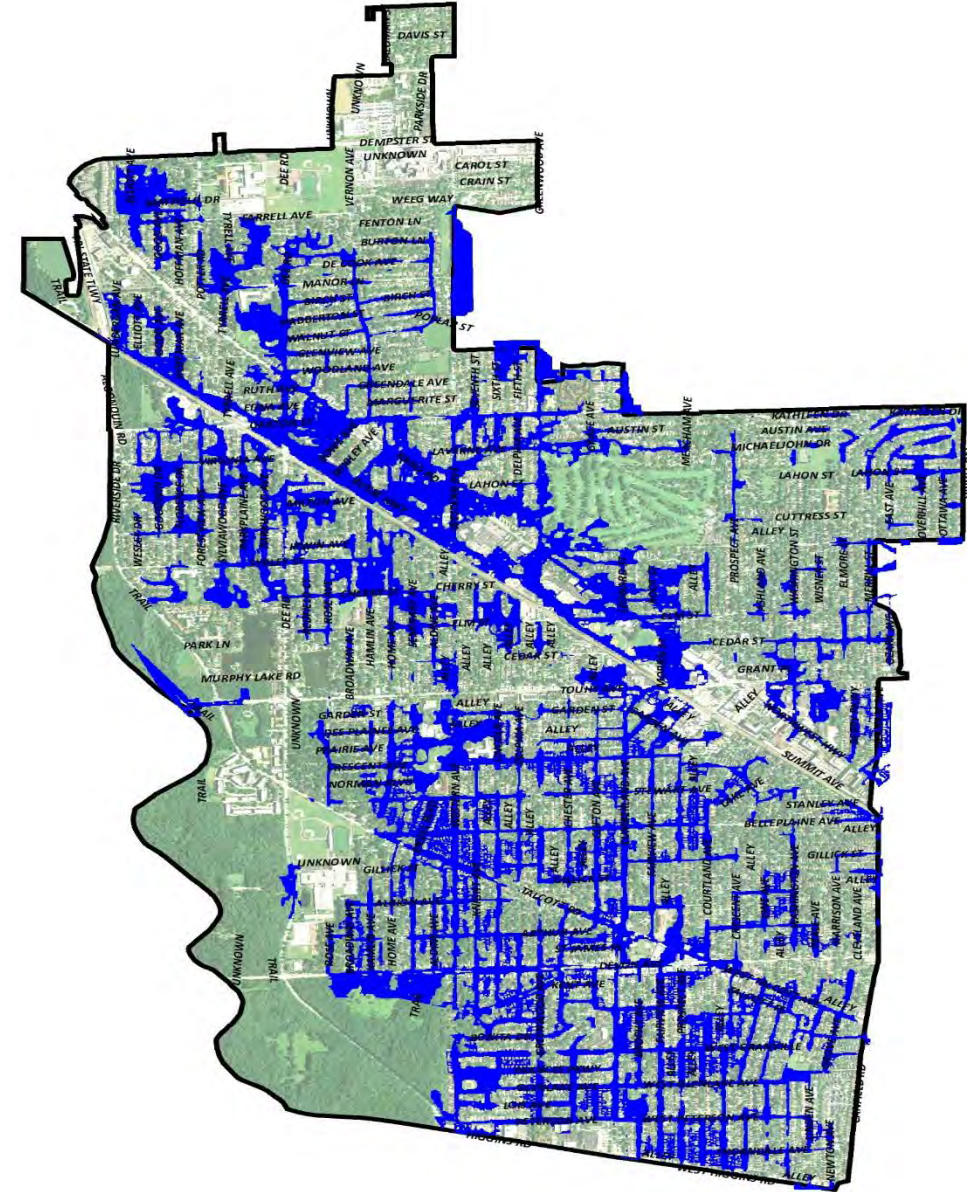


Model Simulation of 4/18/13 Flood Event



Selection of Project Areas

- Citywide model was simulated for 100-year storm
- Ponding areas were mapped



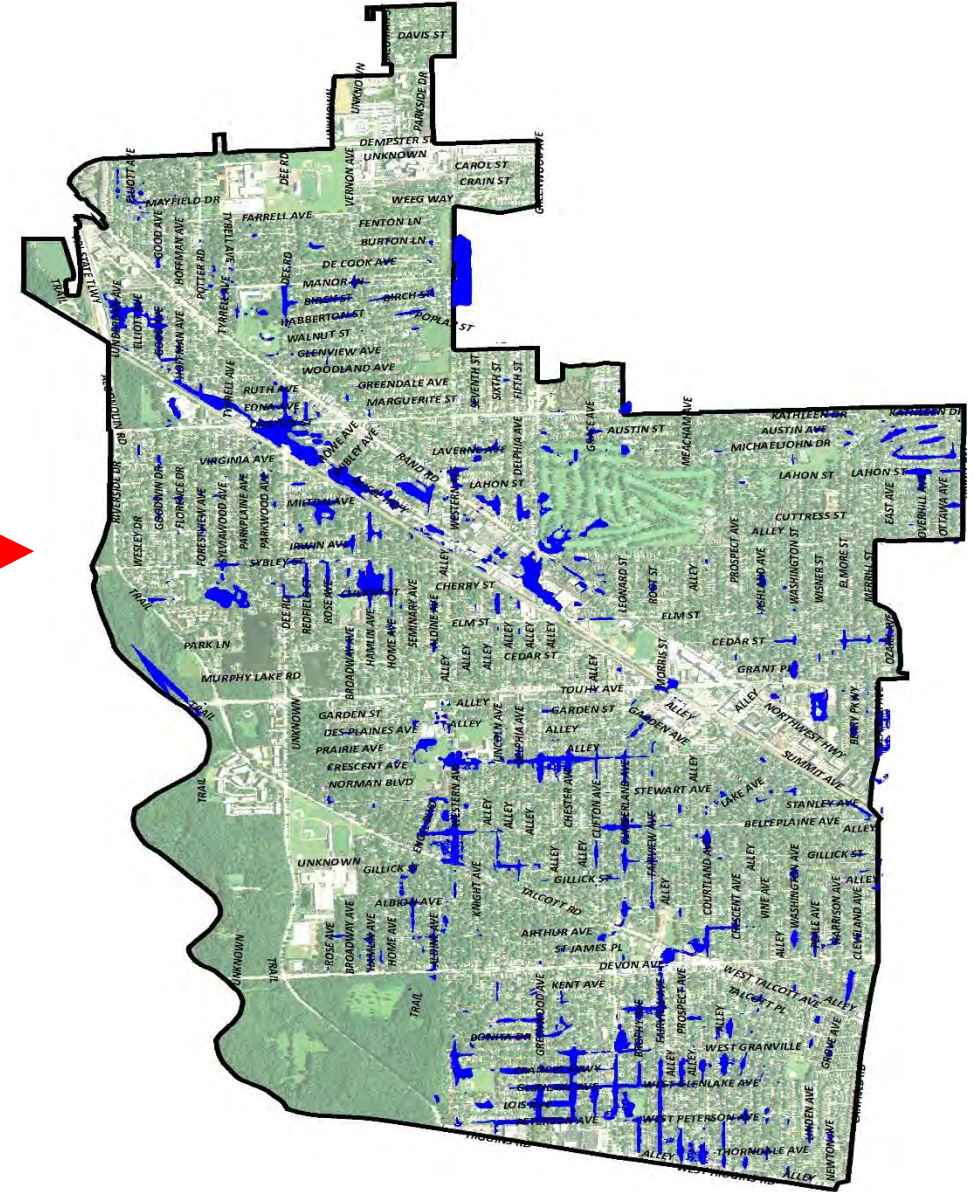
100-year Ponding Depth > 0"

Stormwater Master Plan



Selection of Project Areas

- Citywide model was simulated for 100-year storm
- Ponding area threshold changed to 6" minimum

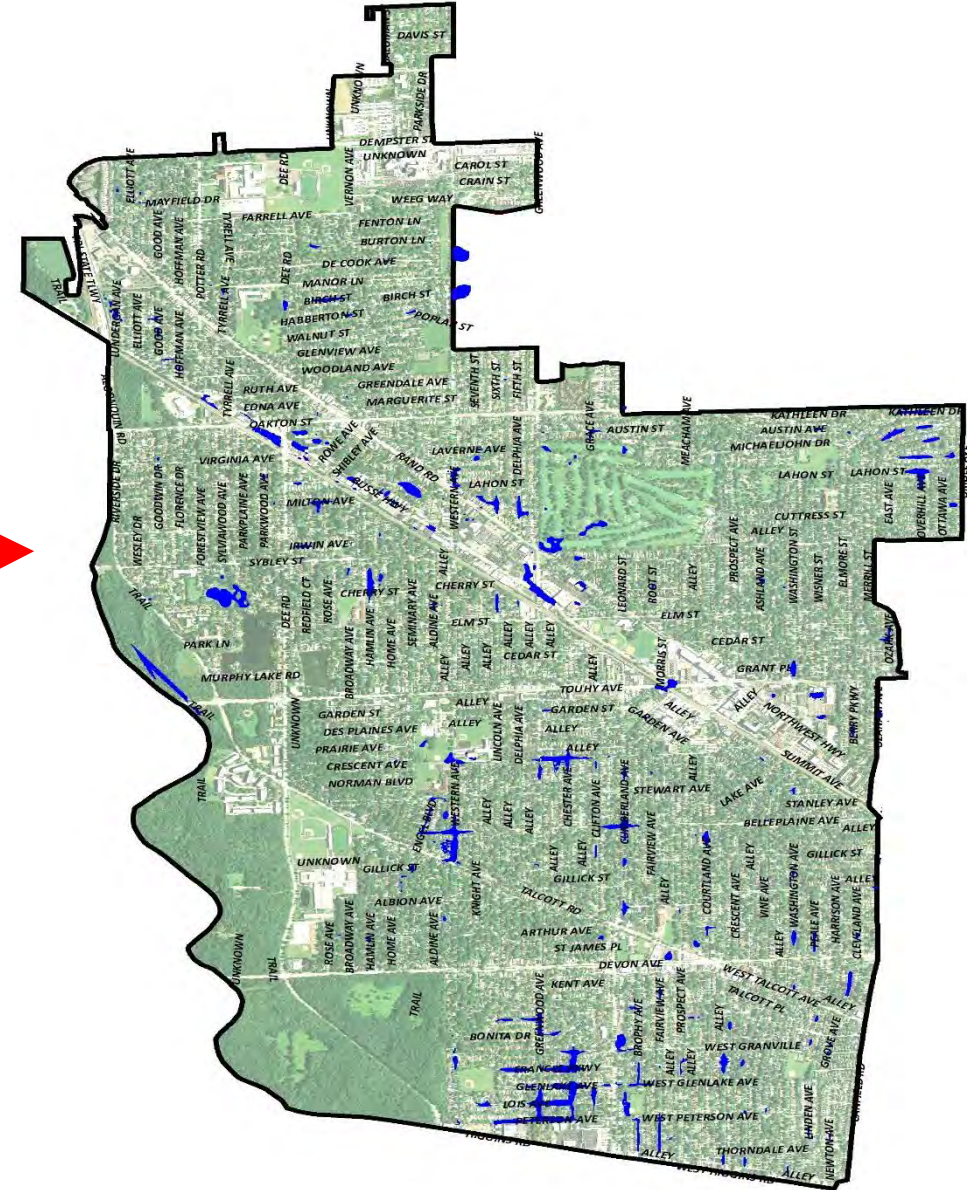


100-year Ponding Depth > 6"



Selection of Project Areas

- Citywide model was simulated for 100-year storm
- Ponding area threshold changed to 12" minimum

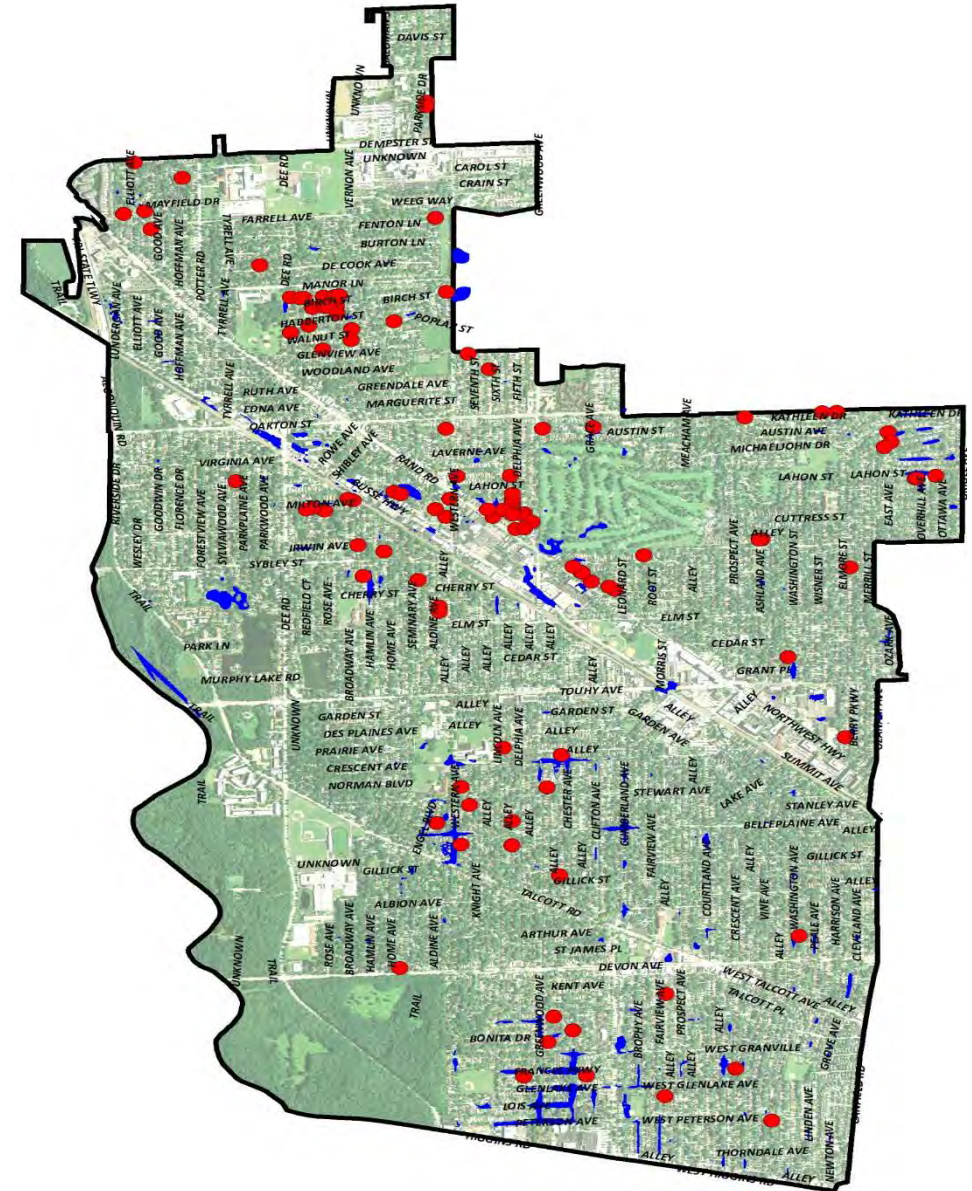


100-year Ponding Depth > 12"



Selection of Project Areas

- Citywide model was simulated for 100-year storm
- Ponding area threshold changed to 12" minimum
- Flood questionnaire results for Overland Flooding plotted

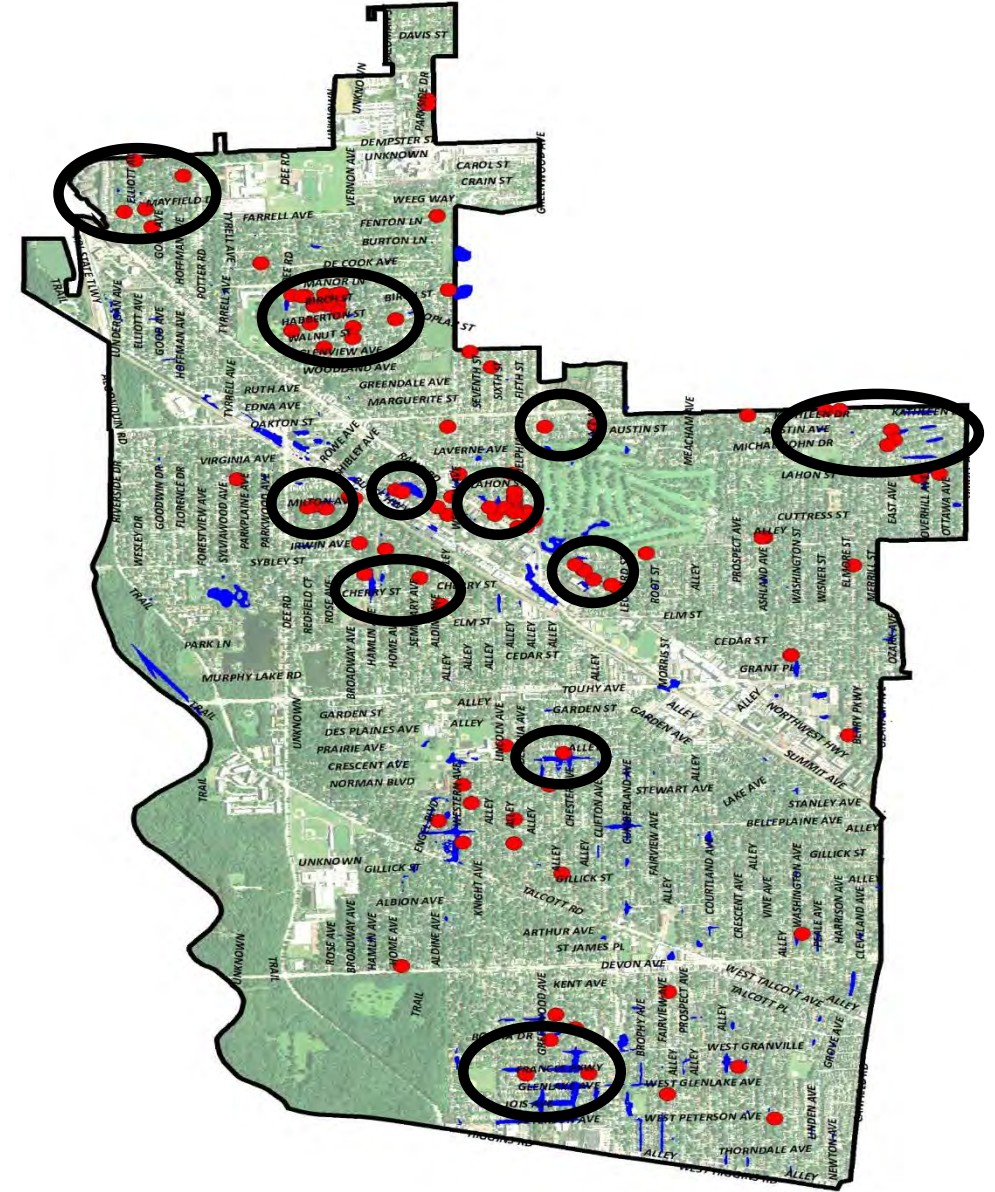


**100-year Ponding Depth > 12"
With Flood Questionnaires**



Selection of Project Areas

- Project areas selected by convergence of minimum 1' ponding and reporting of overland flooding on questionnaires



Development of Projects

- Projects were developed to provide 25-, 50-, or 100-year LOP

Design Storms
25-yr: 2.6" in 1-hour
50-yr: 3.0" in 1-hour
100-yr: 3.6" in 1-hour

- Two main types of projects
 - Conveyance
 - Storage



Development of Projects

- Conveyance Projects require an **outfall**
 - Existing combined system does not have adequate capacity for higher LOP's.
 - Limited opportunity for new river outfalls
 - Proximity to river (right of way or easement)
 - Sewer Separation required
 - Physical constraints on outfall size limit the LOP that can be provided



Development of Projects

- **Storage Projects** require open space
 - Public land not necessarily City-controlled
 - Private land requires landowner cooperation
 - Chicken-vs-egg



Detention Basin



Detention Vault



Development of Projects





- General Observations:

- Fewer areas than may have been expected
- Primarily storage-based projects
- The following projects are proposed for inclusion in SMP with the LOP to be selected by City



Project – Northeast Park Area (Existing)

Legend

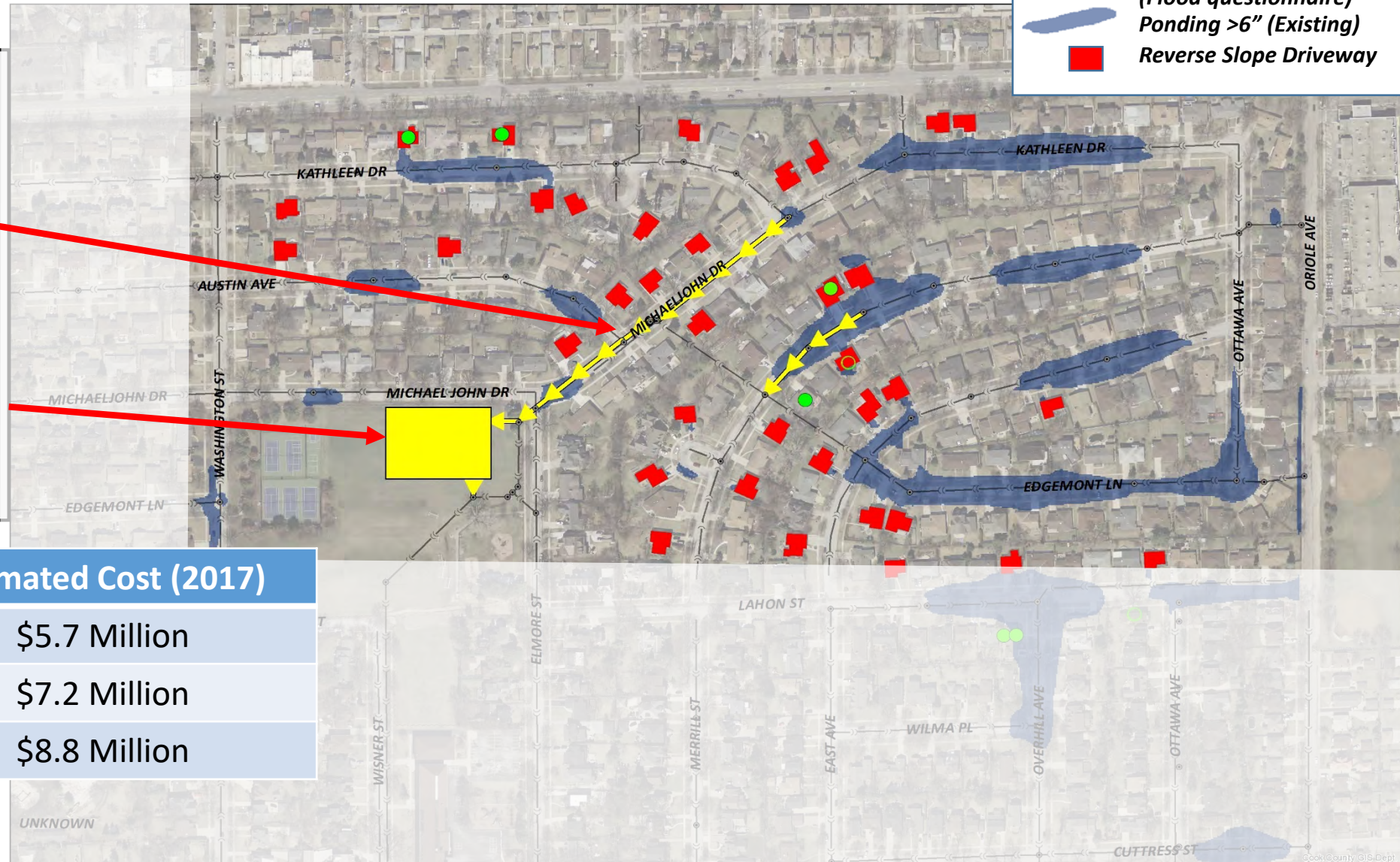
-  Overland Flooding (Flood questionnaire)
-  Rear Yard Flooding (Flood questionnaire)
-  Ponding >6" (Existing)
-  Reverse Slope Driveway



Project – Northeast Park Area (Proposed)

Project Components

1. Relief Sewers
(24" to 60")
2. Underground Storage
(6 ac-ft to 10 ac-ft)



Level of Protection	Estimated Cost (2017)
25-year	\$5.7 Million
50-year	\$7.2 Million
100-year	\$8.8 Million



Project – Northwest Park (Existing)

Legend

- Overland Flooding
(Flood questionnaire)
- Rear Yard Flooding
(Flood questionnaire)
- Ponding >6" (Existing)



Project – Northwest Park (Proposed)

Project Components

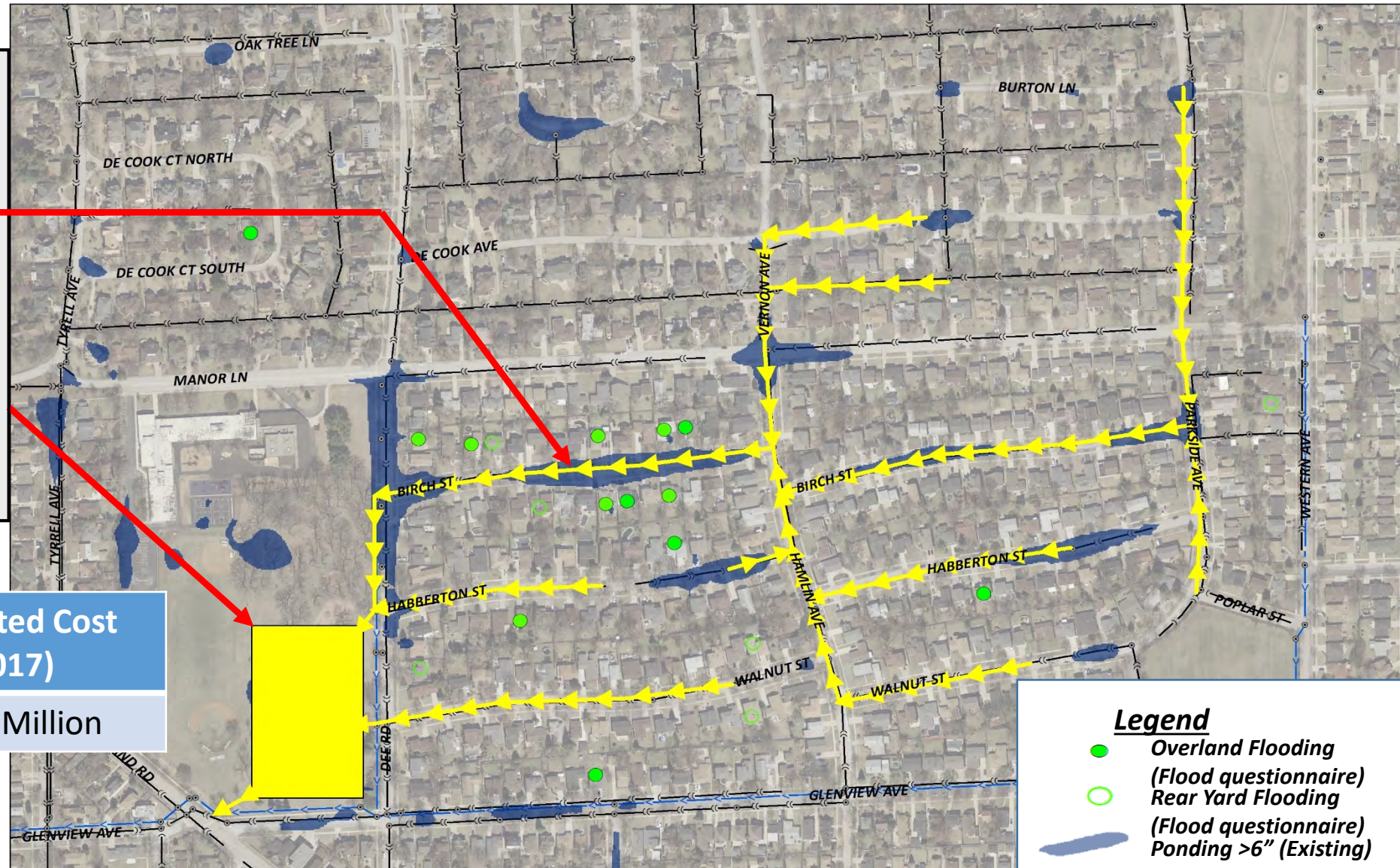
1. Sewer Separation
(18" to 84" Sewer)
2. Excavated Storage
(34 ac-ft)

Level of Protection

100-year

Estimated Cost
(2017)

\$15.7 Million



Stormwater Master Plan

Project – Crescent Avenue (Existing)

Legend

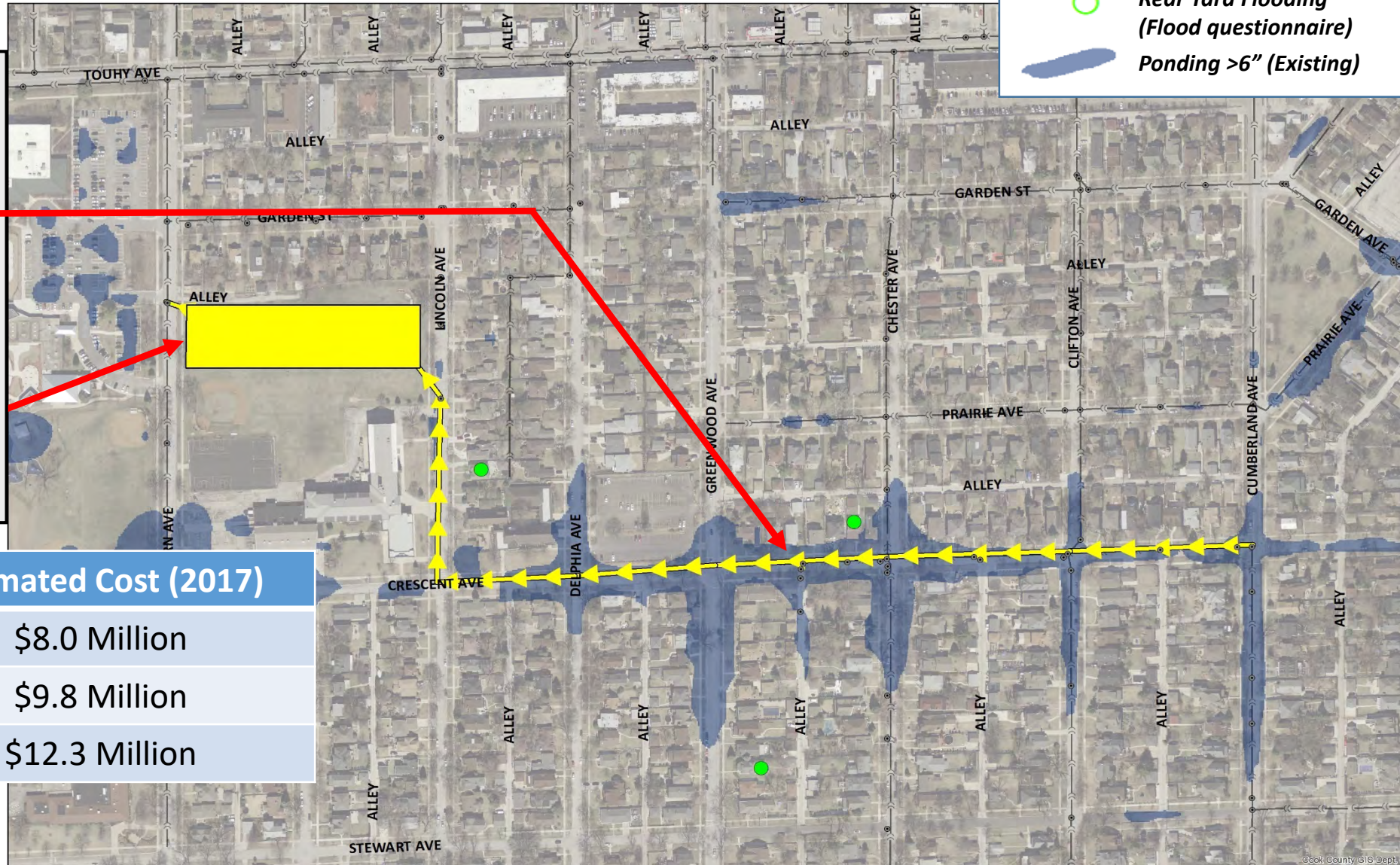
- Overland Flooding (Flood questionnaire)
- Rear Yard Flooding (Flood questionnaire)
- Ponding >6" (Existing)



Project – Crescent Avenue (Proposed)

Project Components

1. Relief Sewers
(60" to 84")
2. Underground Storage
(7.2 ac-ft to 12 ac-ft)



Level of Protection

Estimated Cost (2017)

25-year

\$8.0 Million

50-year

\$9.8 Million




100-year

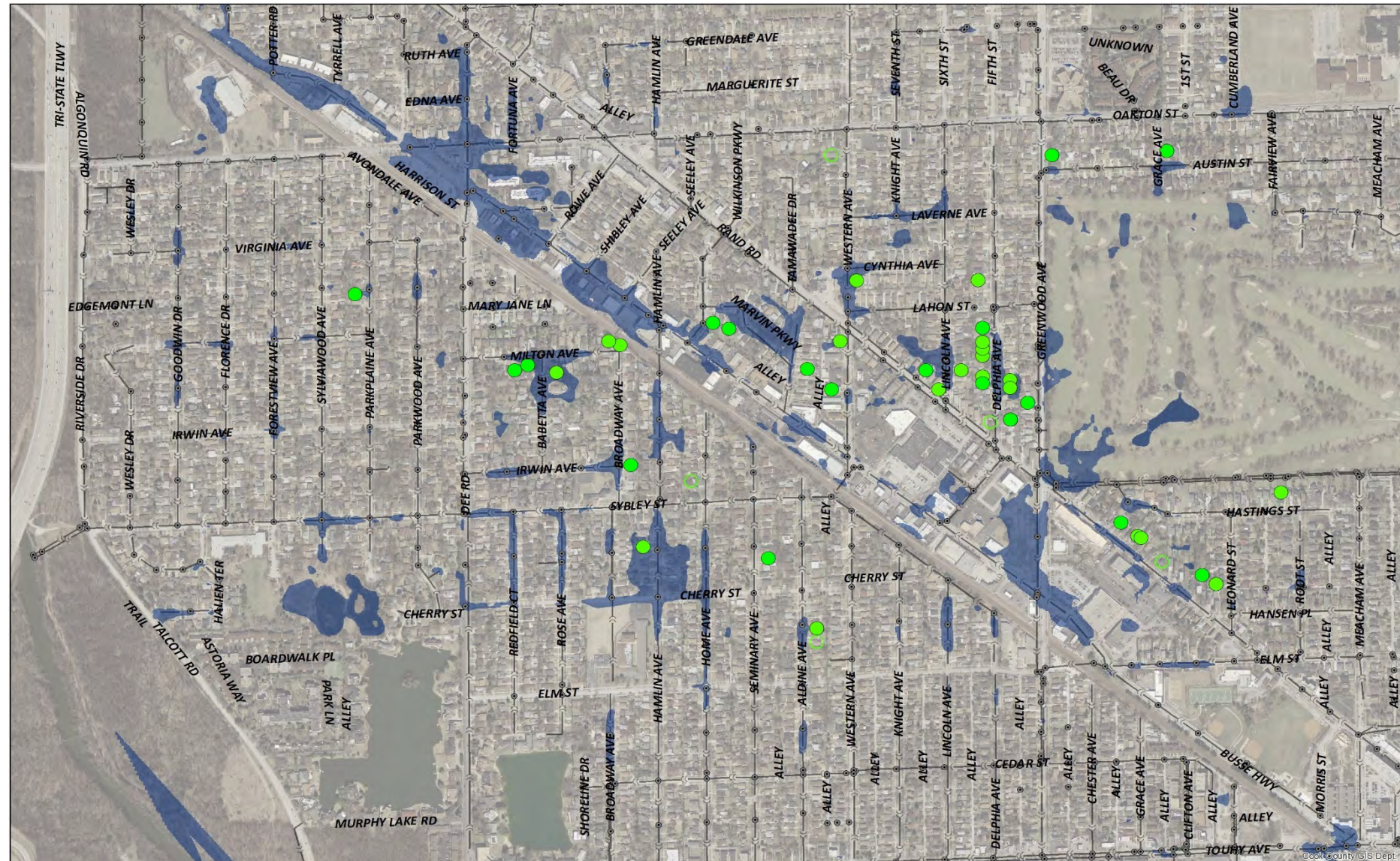
\$12.3 Million



Sibley Corridor (Existing)

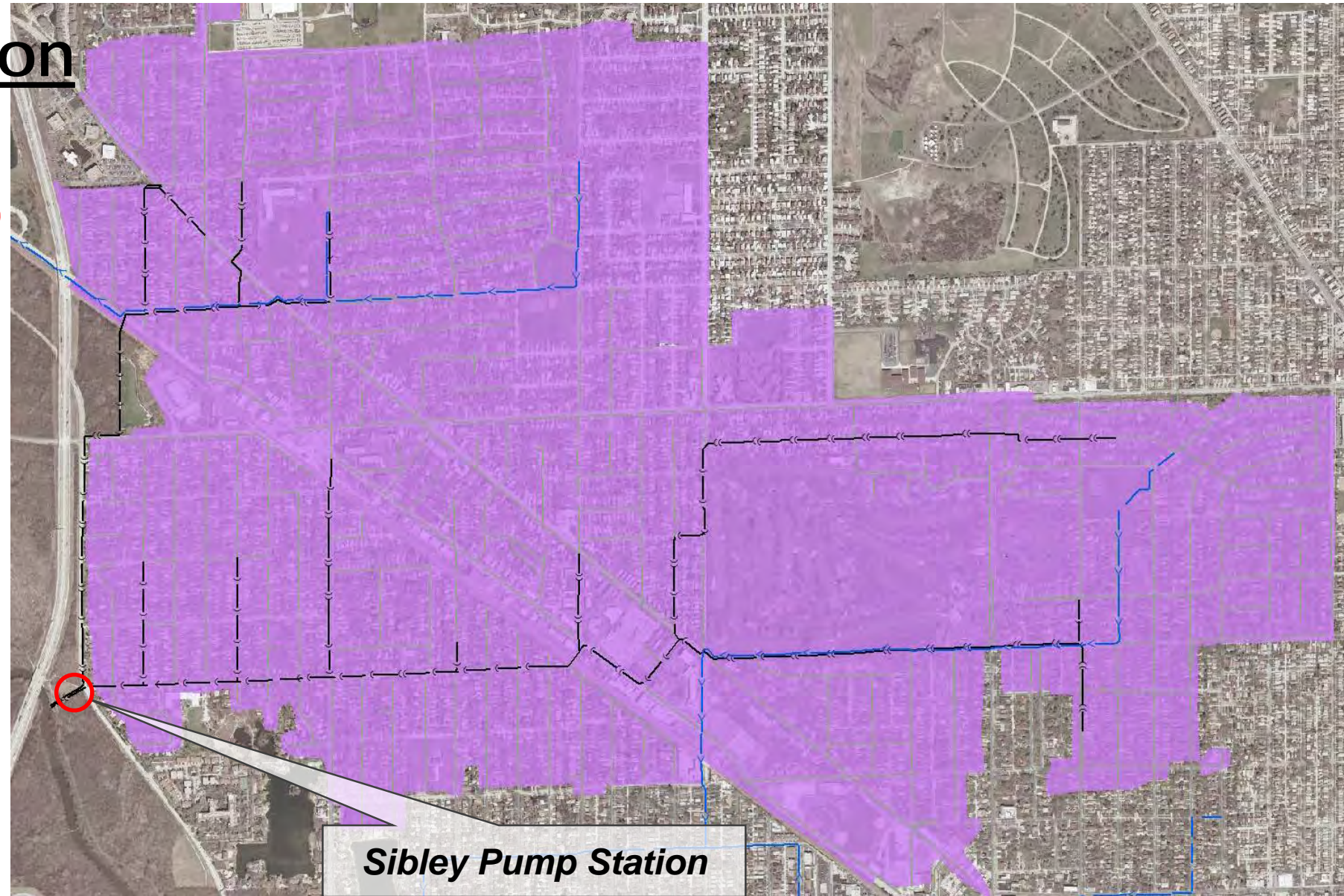
Legend

-  **Overland Flooding**
(Flood questionnaire)
-  **Rear Yard Flooding**
(Flood questionnaire)
-  **Ponding >6" (Existing)**



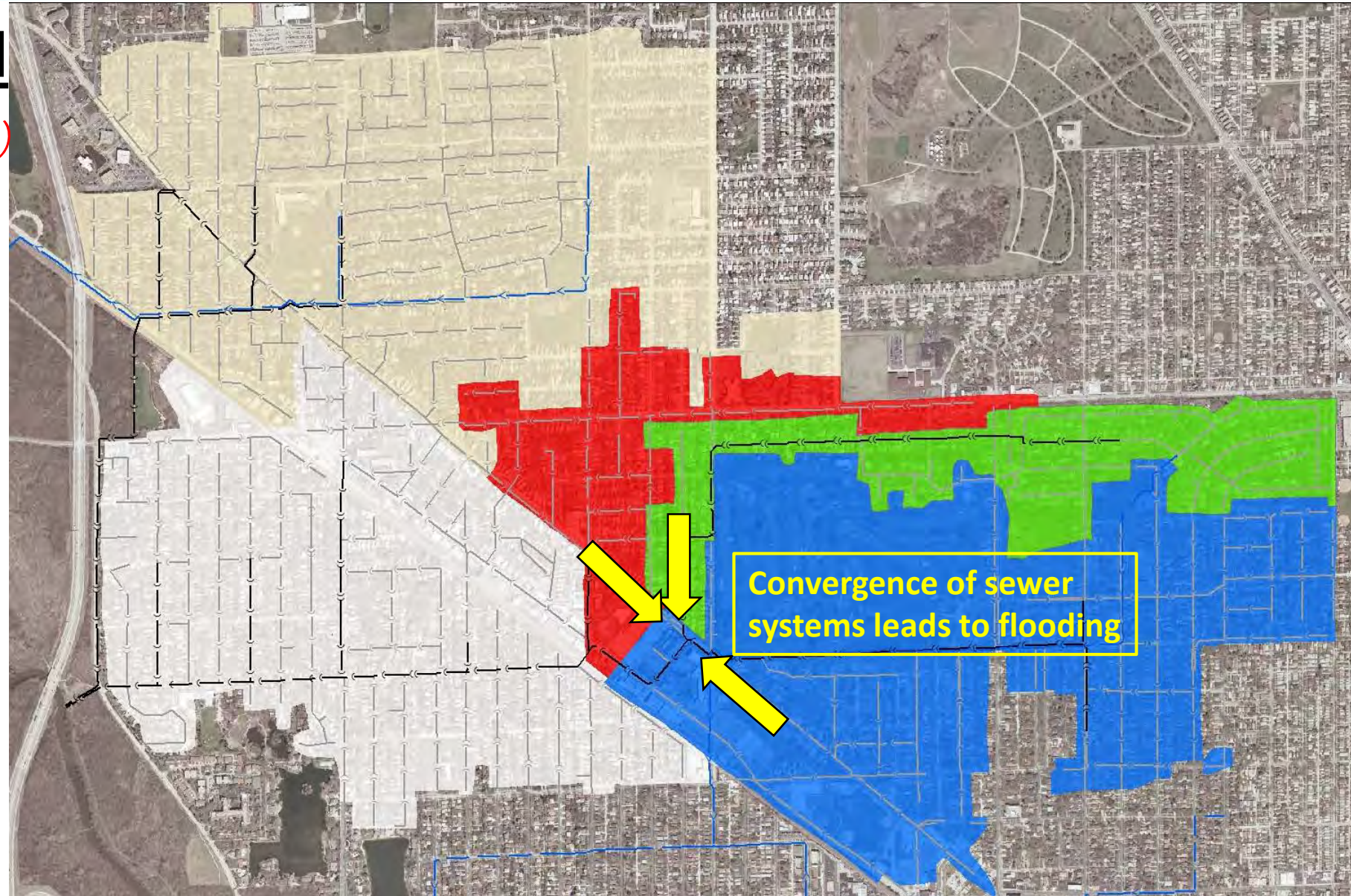
Sibley Pump Station Watershed Area

(From 2012 Feasibility Study)



Sibley Watershed

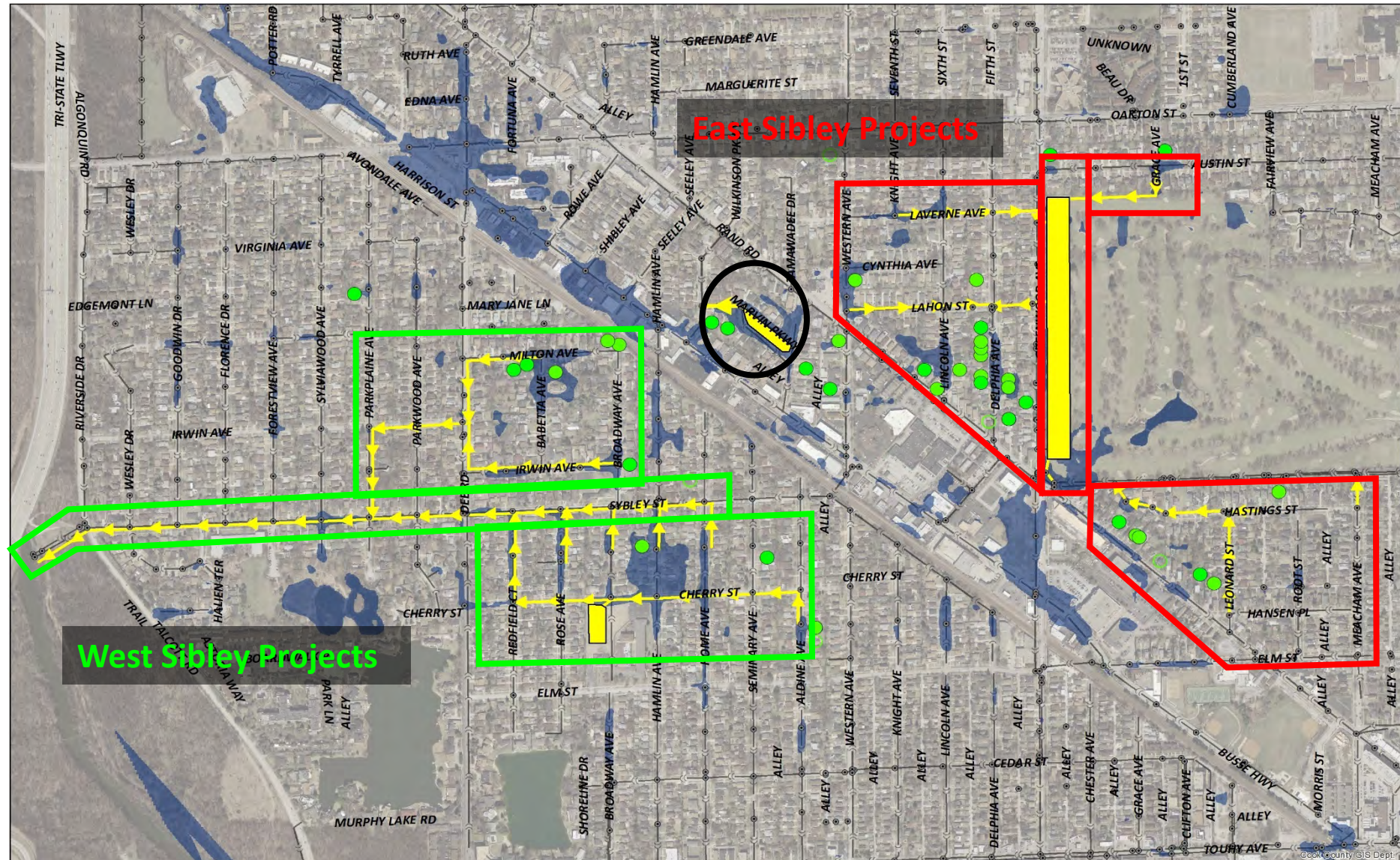
(From 2012 Feasibility Study)



Projects - Sibley Corridor (Proposed)

Legend

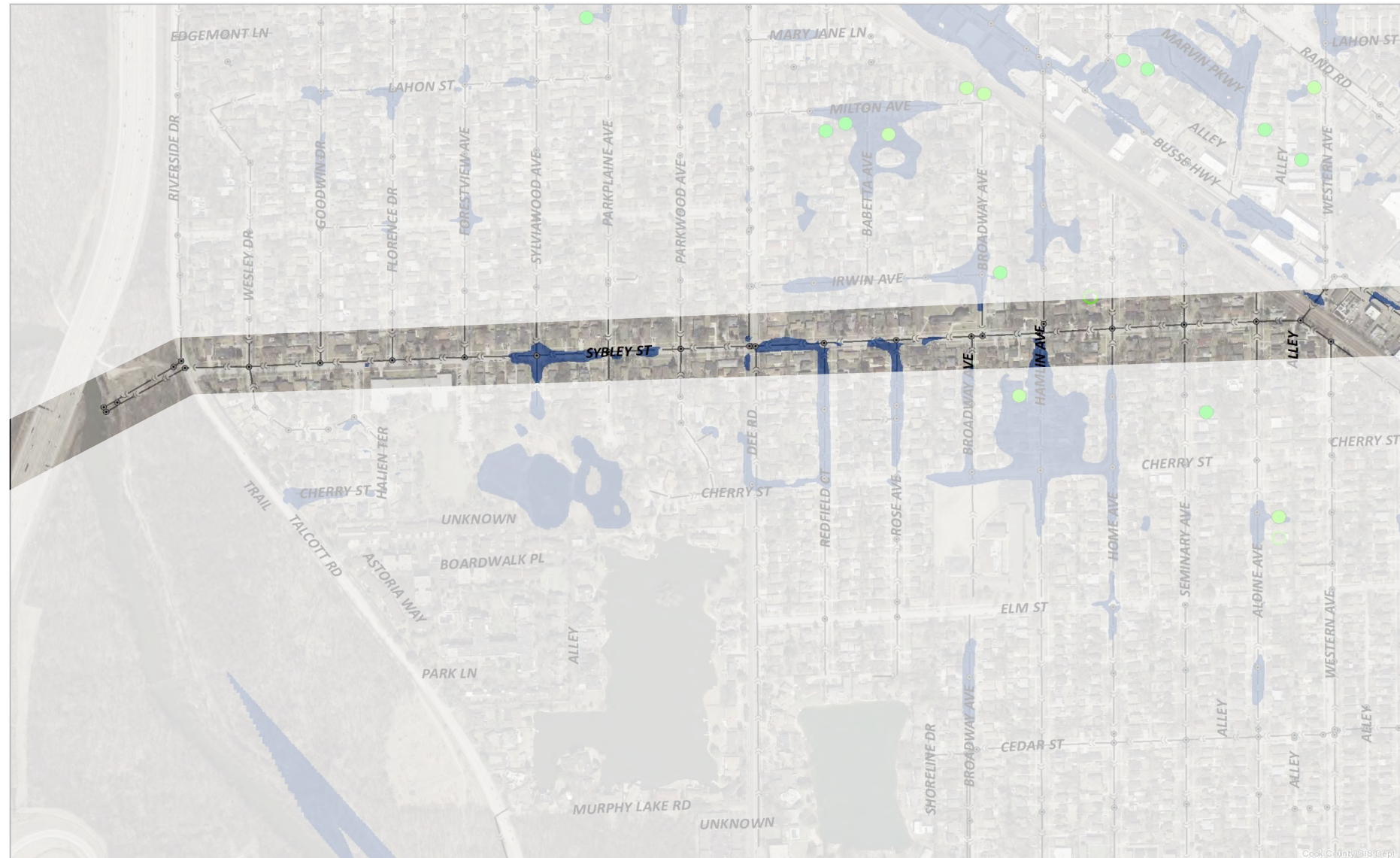
- Overland Flooding (Flood questionnaire)
- Rear Yard Flooding (Flood questionnaire)
- Ponding >6" (Existing)



Project – Sibley Avenue Storm Sewer (Existing)

Legend

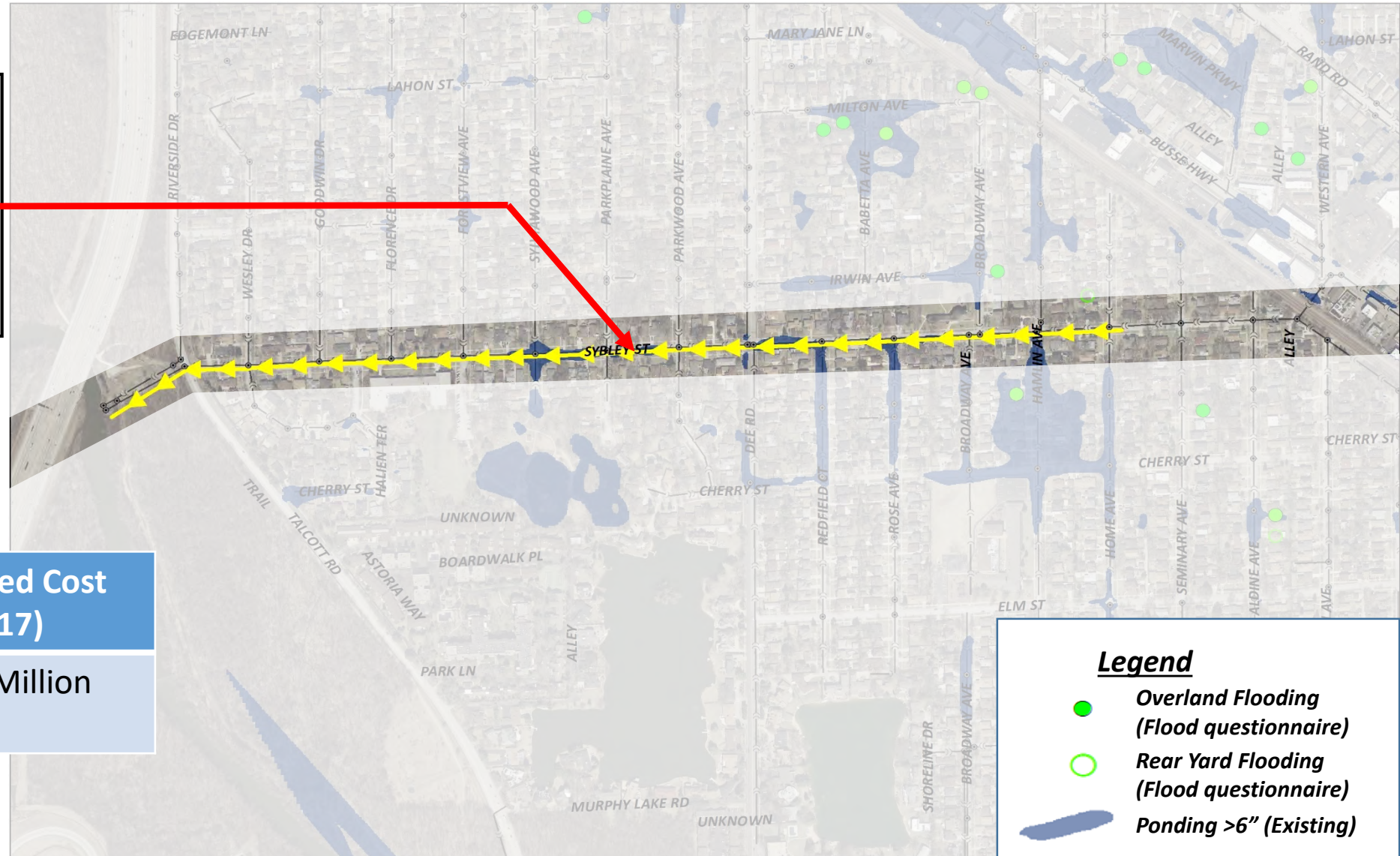
- Overland Flooding
(Flood questionnaire)
- Rear Yard Flooding
(Flood questionnaire)
- Ponding >6" (Existing)



Project – Sibley Avenue Storm Sewer (Proposed)

Project Components

1. 48" to 84" Storm Sewer



Legend

- Overland Flooding (Flood questionnaire)
- Rear Yard Flooding (Flood questionnaire)
- Ponding >6" (Existing)

Level of Protection

Estimated Cost
(2017)

N/A
(enabling project)

\$12.0 Million



Project – Cherry Street (Existing)

Legend

- Overland Flooding
(Flood questionnaire)
- Rear Yard Flooding
(Flood questionnaire)
- Ponding >6" (Existing)



Project – Cherry Street (Proposed)

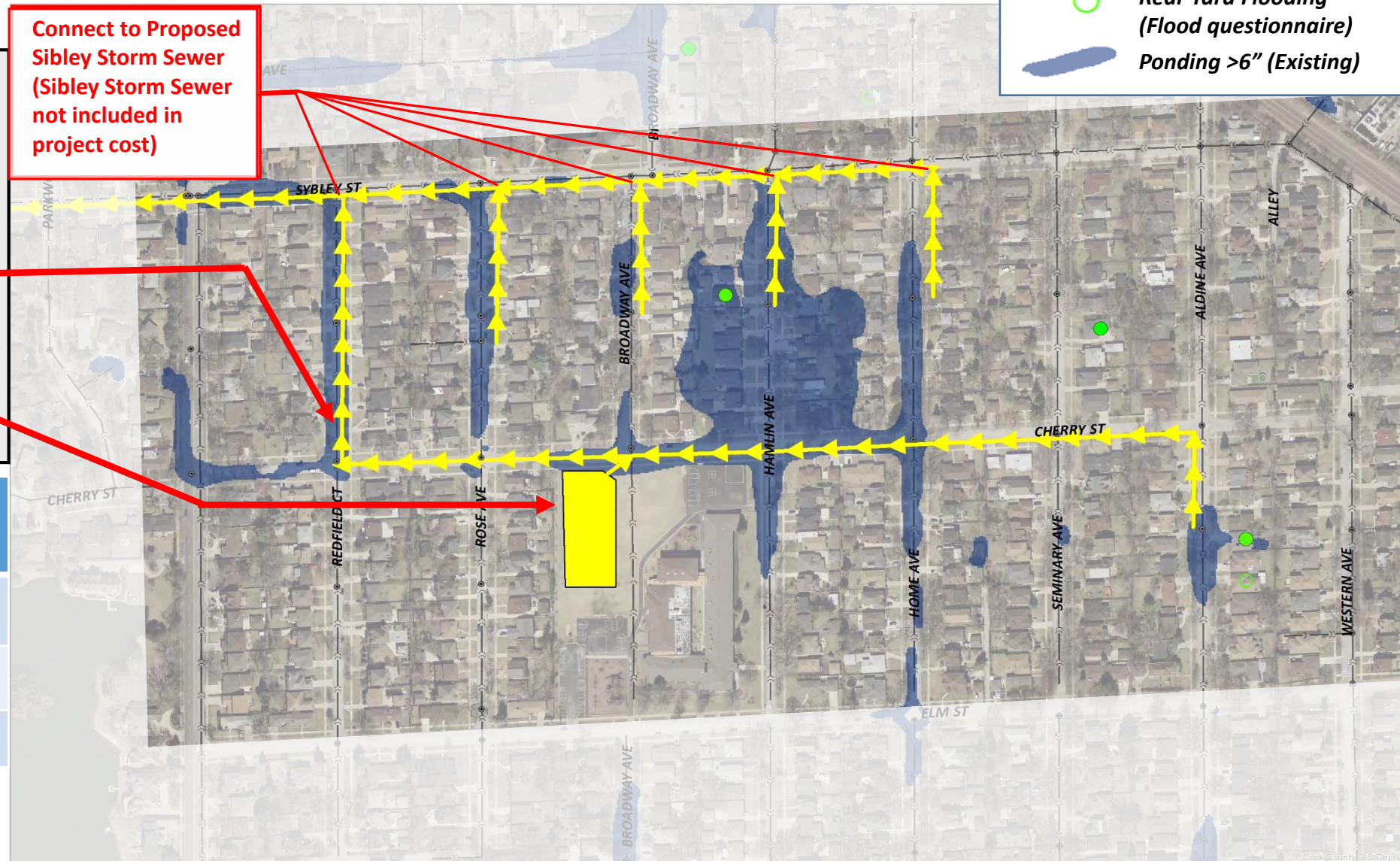
Project Components

1. Sewer Separation
(24" to 48" Storm Sewers)
2. Underground Storage
(2.1 ac-ft to 4.6 ac-ft)

Connect to Proposed
Sibley Storm Sewer
(Sibley Storm Sewer
not included in
project cost)

Legend

- Overland Flooding
(Flood questionnaire)
- Rear Yard Flooding
(Flood questionnaire)
- Ponding >6" (Existing)



Level of Protection	Estimated Cost (2017)
25-year	\$3.9 Million
50-year	\$4.7 Million
100-year	\$5.7 Million



Project – Milton/Babetta/Irwin (Existing)

Legend

- Overland Flooding
(Flood questionnaire)
- Rear Yard Flooding
(Flood questionnaire)
- Ponding >6" (Existing)

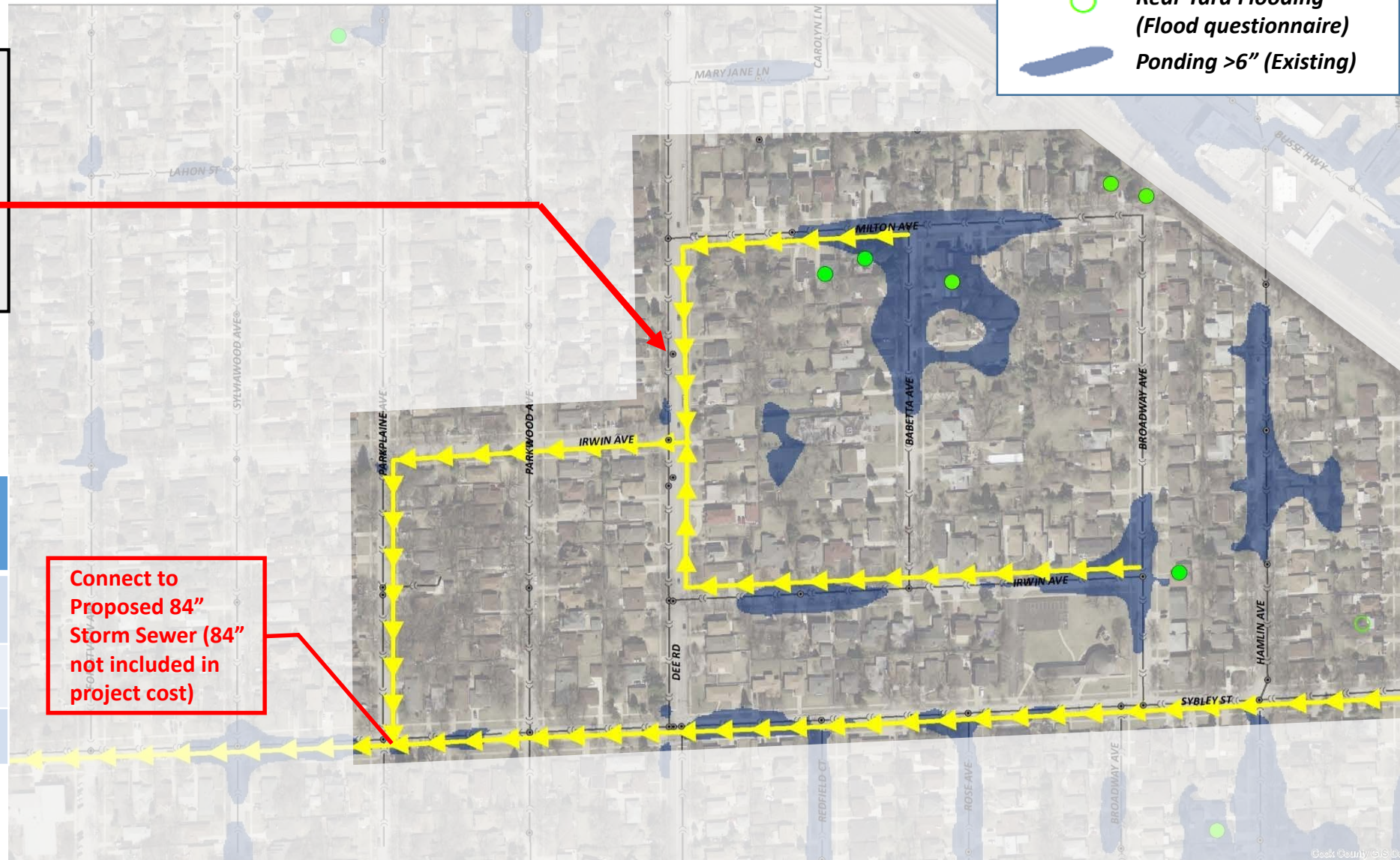


Project – Milton/Babetta/Irwin (Proposed)

Project Components

1. Sewer Separation (36" to 48" Storm Sewers)

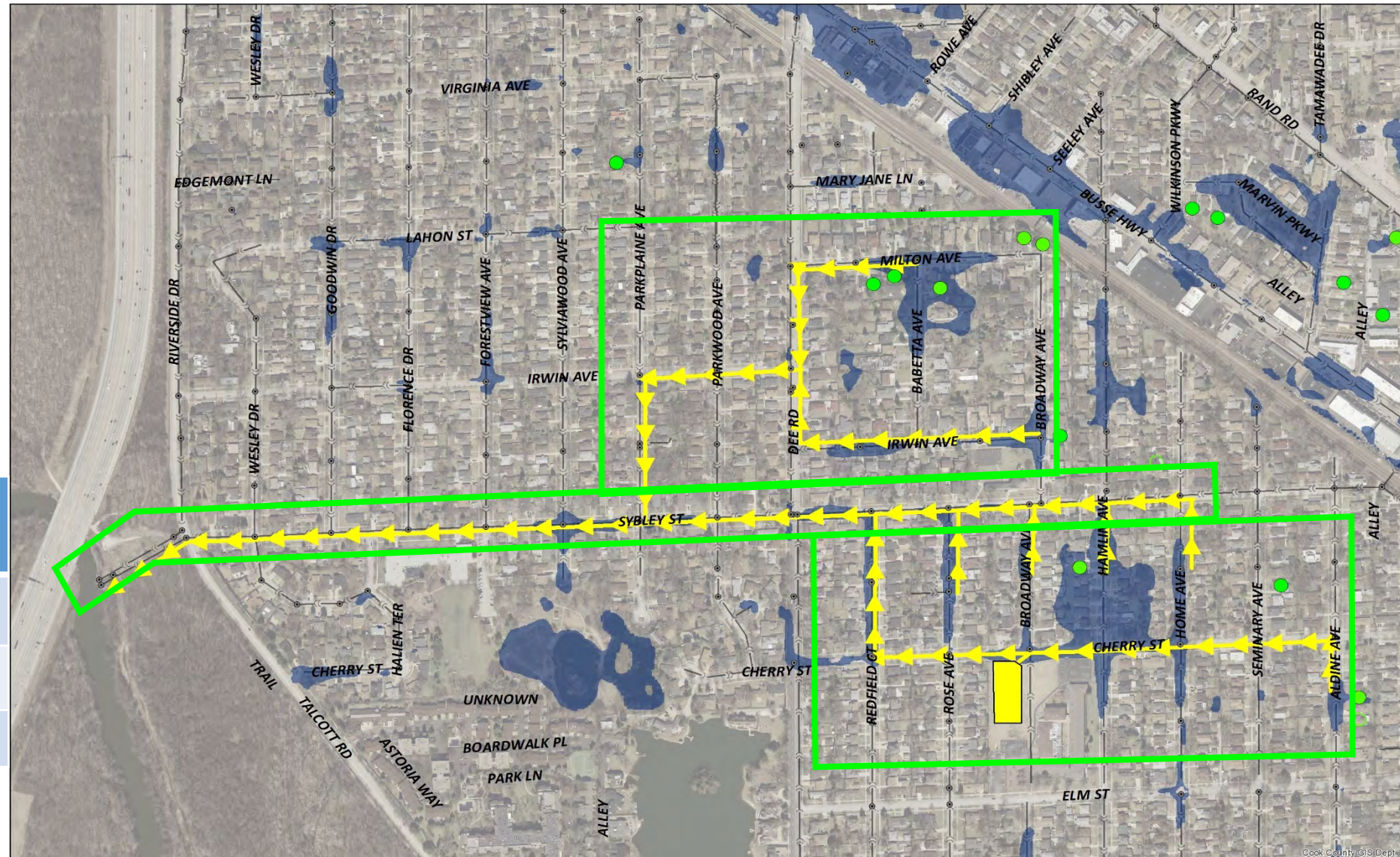
Level of Protection	Estimated Cost (2017)
25-year	\$2.2 Million
50-year	\$2.2 Million
100-year	\$2.3 Million



Projects – West Sibley Projects (Proposed)

Legend

- Overland Flooding
(Flood questionnaire)
- Rear Yard Flooding
(Flood questionnaire)
- Ponding >6" (Existing)



Cook County GIS Dept.

Level of Protection	Estimated Cost (2017)
25-year	\$18.1 Million
50-year	\$18.9 Million
100-year	\$20.0 Million



Project – PRCC Storage (Existing)

Legend

- Overland Flooding
(Flood questionnaire)
- Rear Yard Flooding
(Flood questionnaire)
- Ponding >6" (Existing)



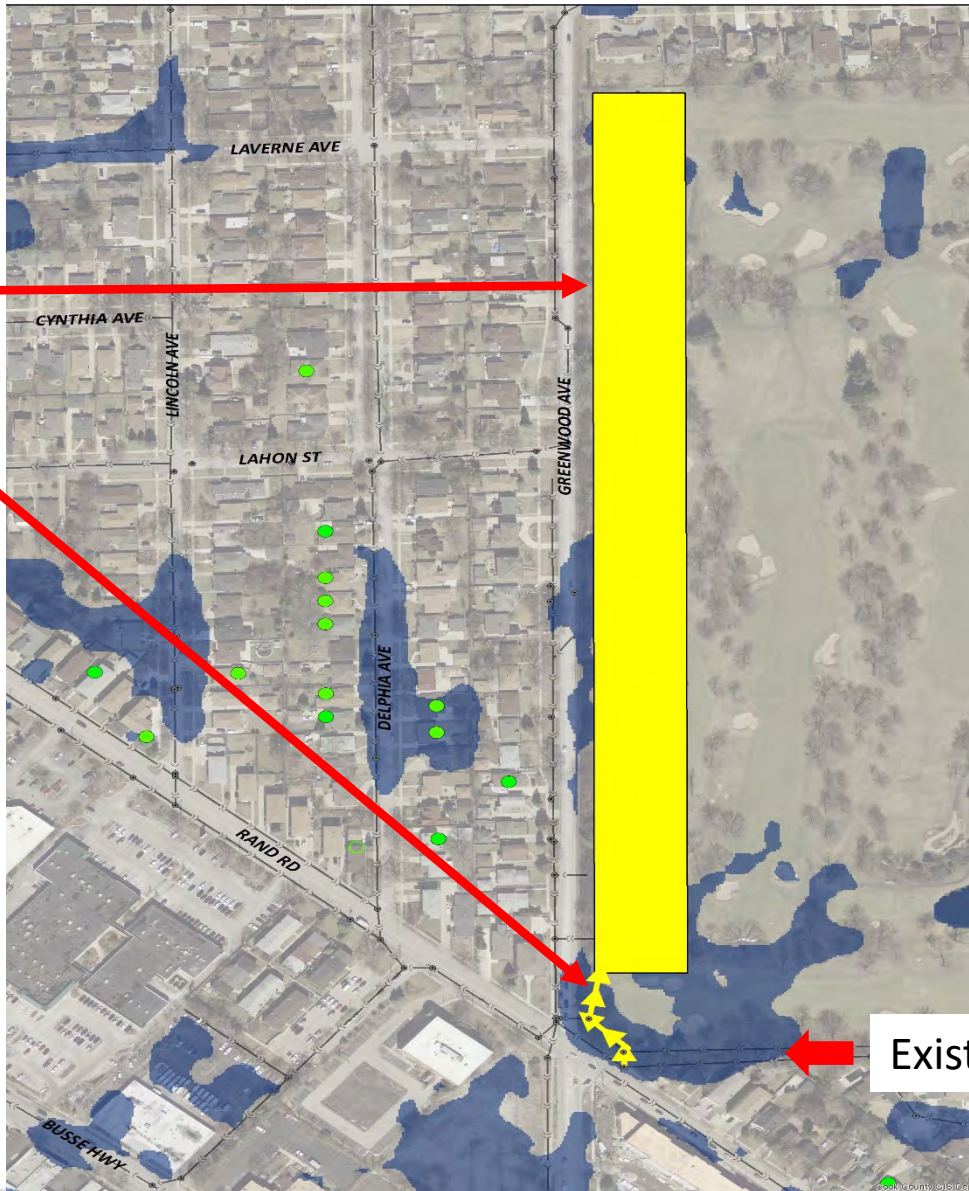
Existing Relief Sewers

Project – PRCC Storage (Proposed)

Project Components

1. Underground Storage
(31 to 45 ac-ft)
2. Relief Sewers
(60" to 72")

Level of Protection	Estimated Cost (2017)
25-year	\$24.6 Million
50-year	\$29.8 Million
100-year	\$35.9 Million



Legend

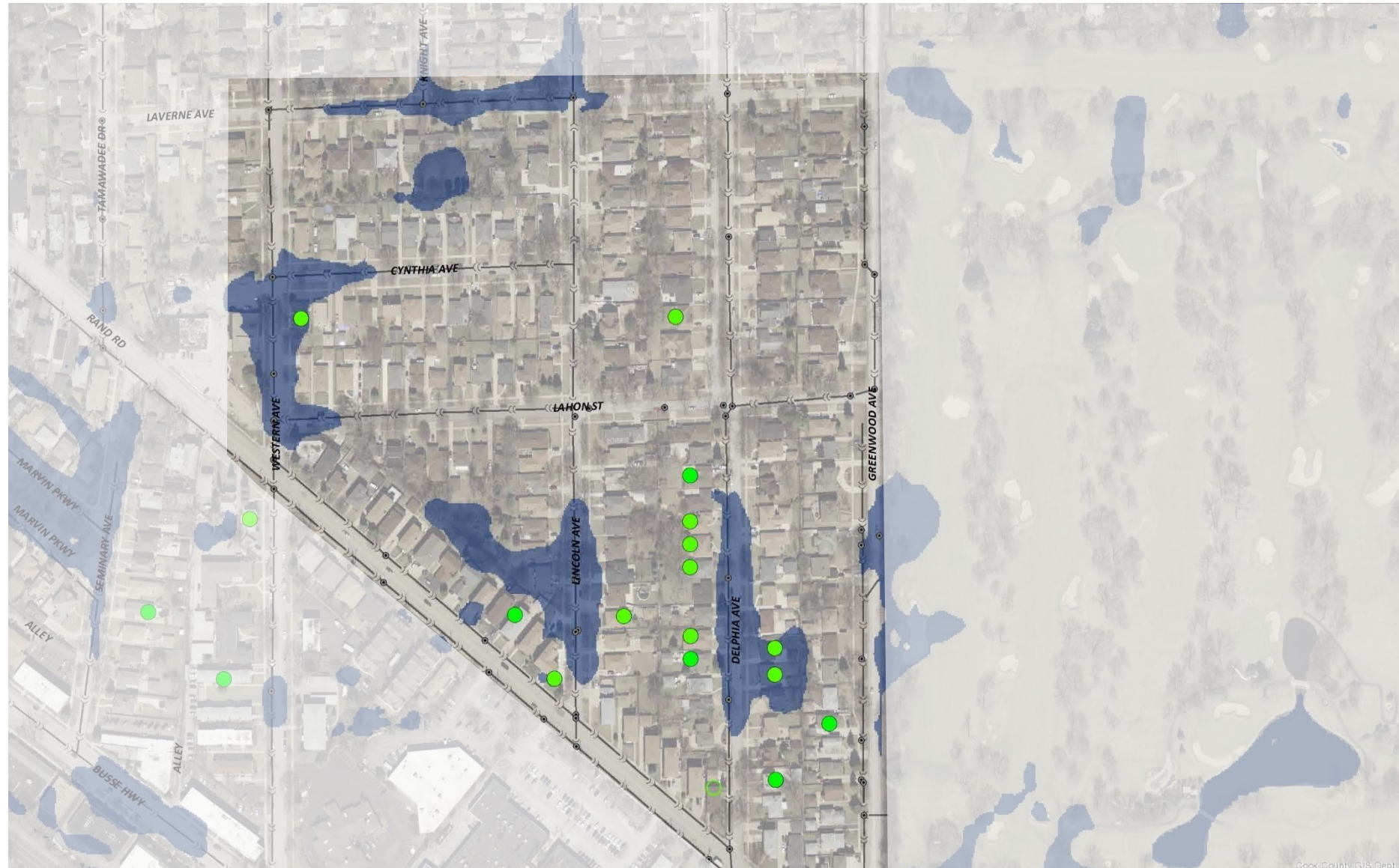
- Overland Flooding
(Flood questionnaire)
- Rear Yard Flooding
(Flood questionnaire)
- Ponding >6" (Existing)

Existing Relief Sewers

Project – Delphia/Laverne/Lahon (Existing)

Legend

- Overland Flooding
(Flood questionnaire)
- Rear Yard Flooding
(Flood questionnaire)
- Ponding >6" (Existing)

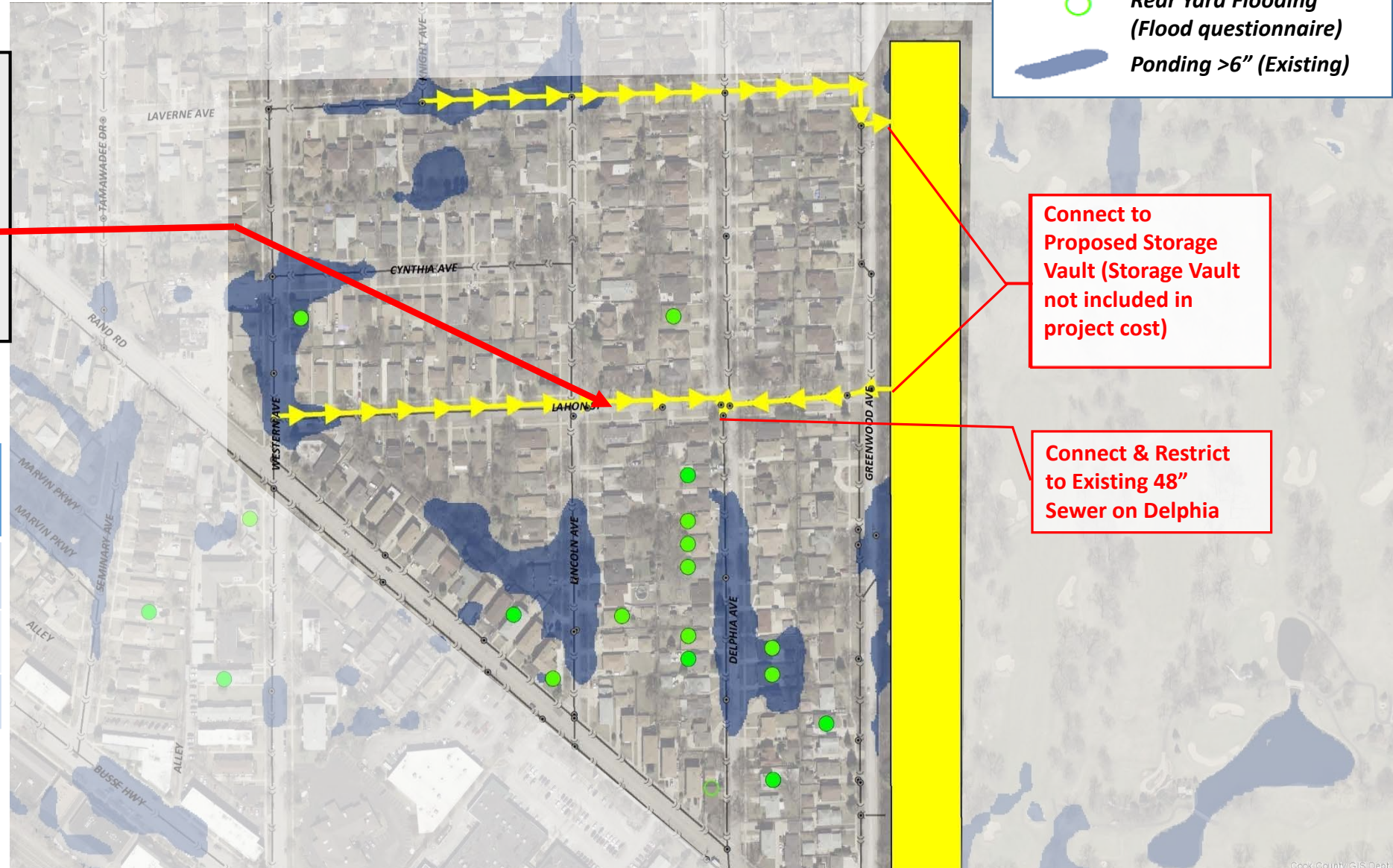


Project – Delphia/Laverne/Lahon (Proposed)

Project Components

1. Relief Sewers (24" to 60")

Level of Protection	Estimated Cost (2017)
25-year	\$1.9 Million
50-year	\$1.9 Million
100-year	\$1.9 Million



Legend

- Overland Flooding (Flood questionnaire)
- Rear Yard Flooding (Flood questionnaire)
- Ponding >6" (Existing)

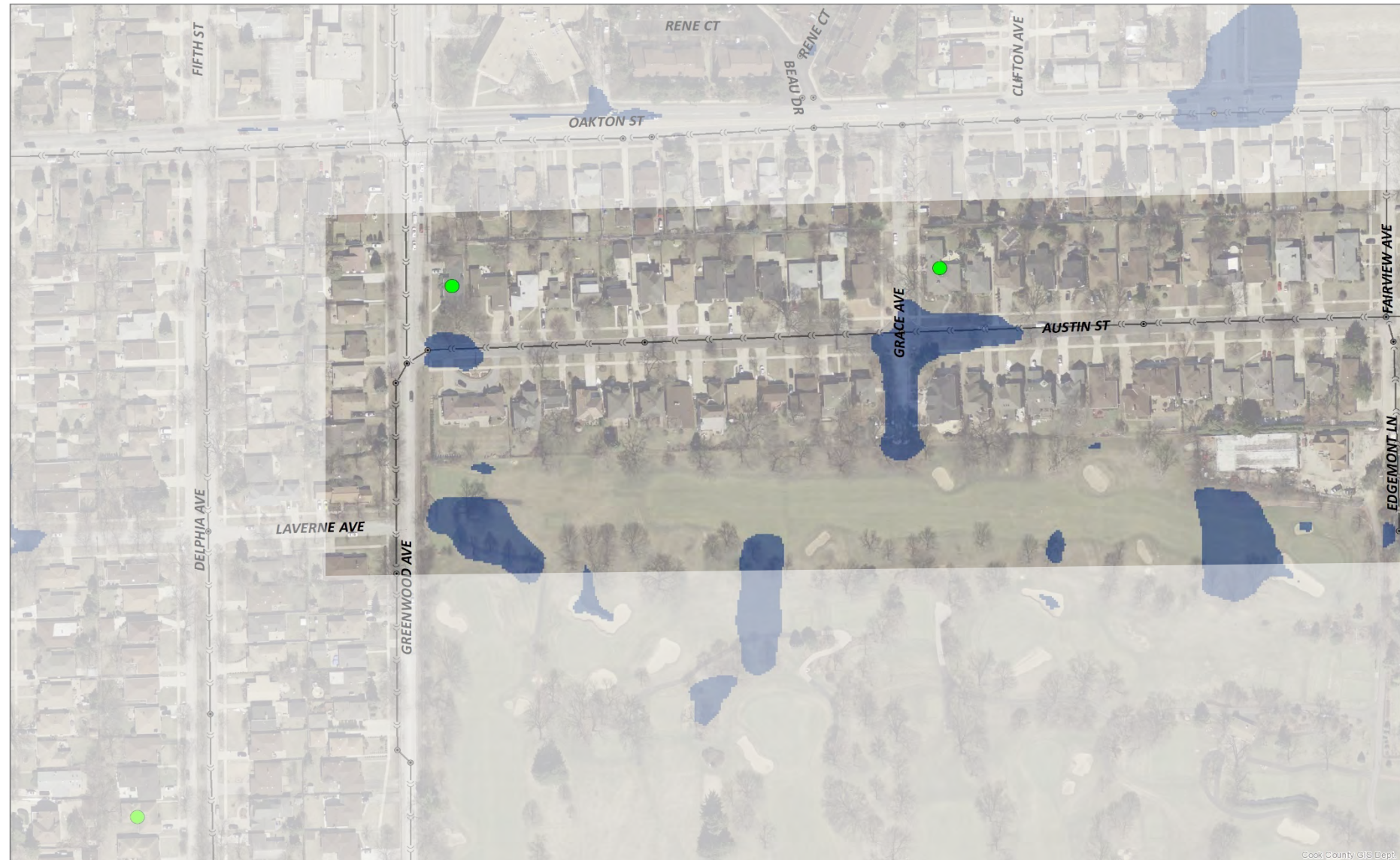
Connect to
Proposed Storage
Vault (Storage Vault
not included in
project cost)

Connect & Restrict
to Existing 48"
Sewer on Delphia

Project – Austin Street (Existing)

Legend

- Overland Flooding
(Flood questionnaire)
- Rear Yard Flooding
(Flood questionnaire)
- Ponding >6" (Existing)

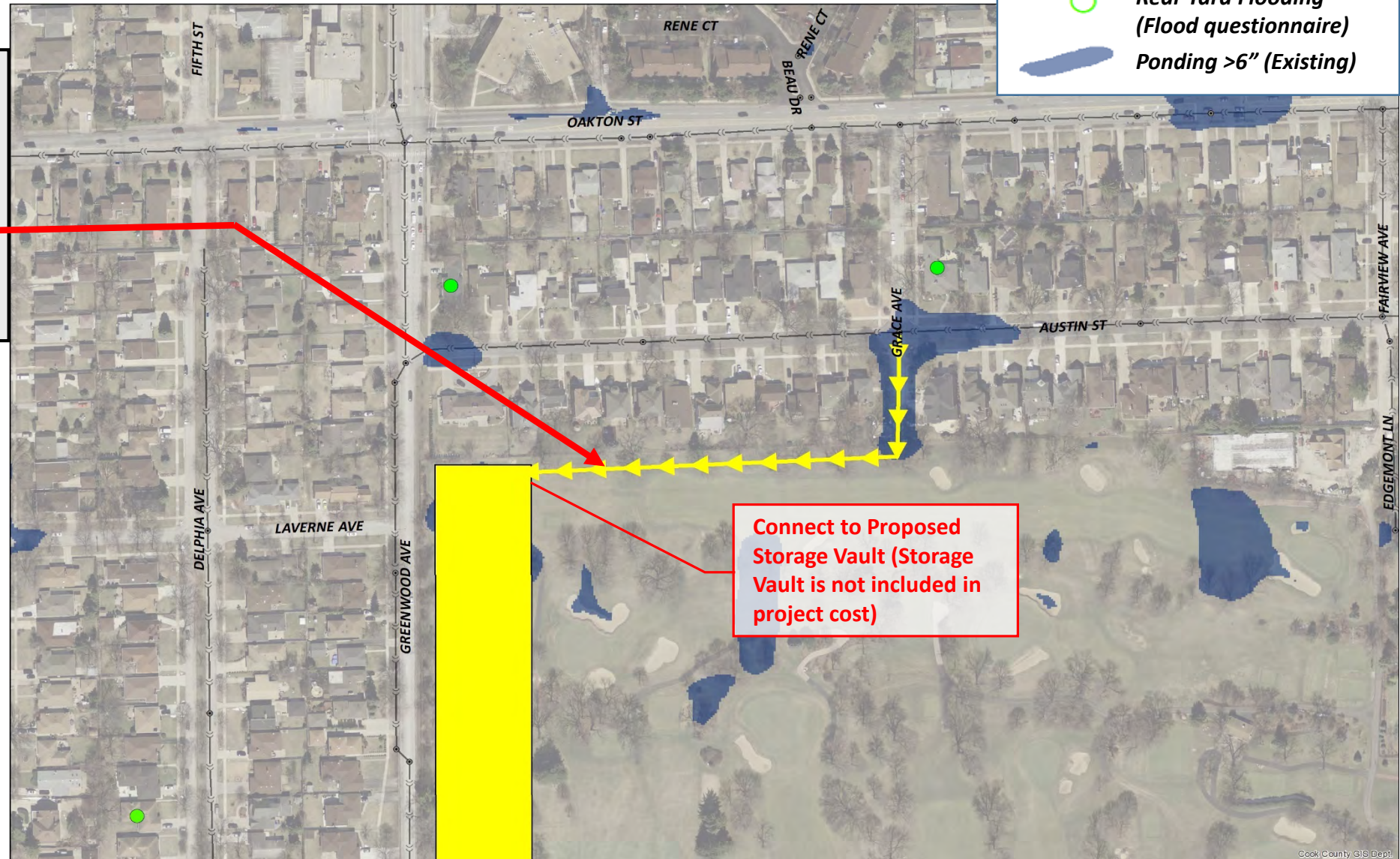


Project – Austin Street (Proposed)

Project Components

1. Relief Sewers (60" to 72")

Level of Protection	Estimated Cost (2017)
25-year	\$0.5 Million
50-year	\$0.5 Million
100-year	\$0.6 Million



Legend

- Overland Flooding (Flood questionnaire)
- Rear Yard Flooding (Flood questionnaire)
- Ponding >6" (Existing)

Project – Hastings Street (Existing)

Legend

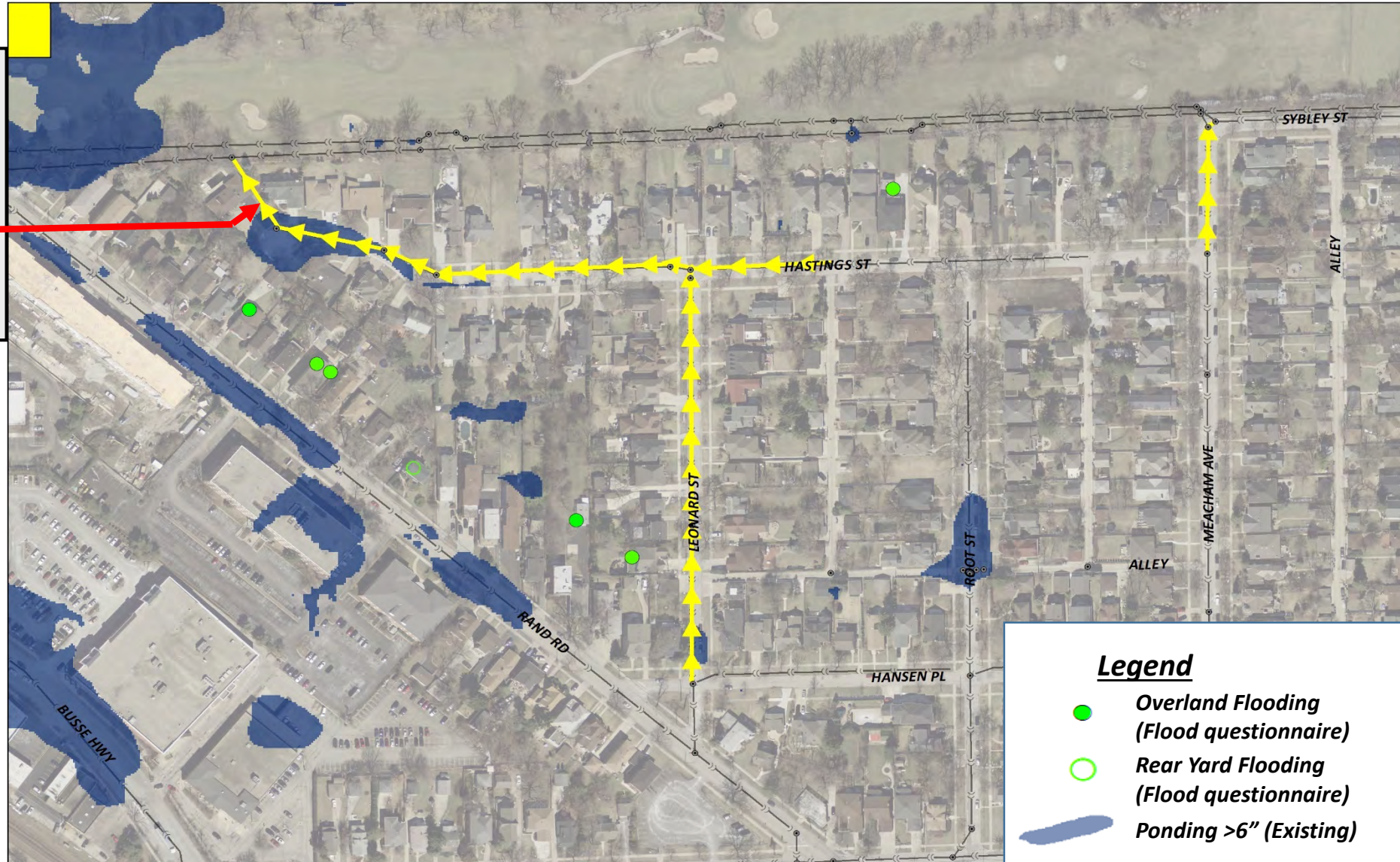
- Overland Flooding
(Flood questionnaire)
- Rear Yard Flooding
(Flood questionnaire)
- Ponding >6" (Existing)



Project – Hastings Street (Proposed)

Project Components

1. Relief Sewers (24" to 36")






Legend

- Overland Flooding
(Flood questionnaire)
- Rear Yard Flooding
(Flood questionnaire)
- Ponding >6" (Existing)

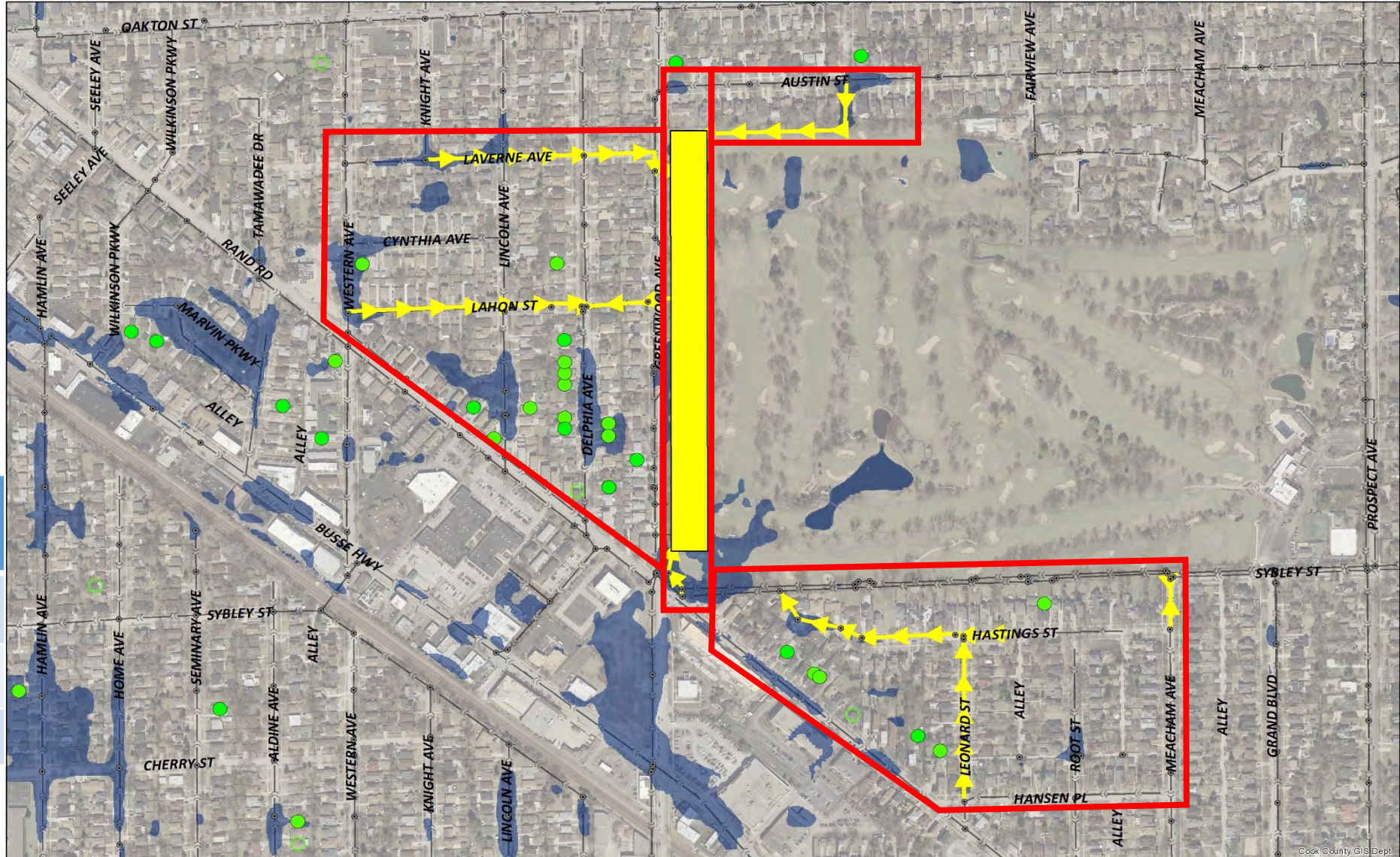


Projects – East Sibley Projects (Proposed)

Legend

-  **Overland Flooding**
(Flood questionnaire)
-  **Rear Yard Flooding**
(Flood questionnaire)
-  **Ponding >6" (Existing)**

Level of Protection	Estimated Cost (2017)
25-year	\$28.3 Million
50-year	\$33.7 Million
100-year	\$39.9 Million



Project – Marvin Parkway (Existing)

Legend

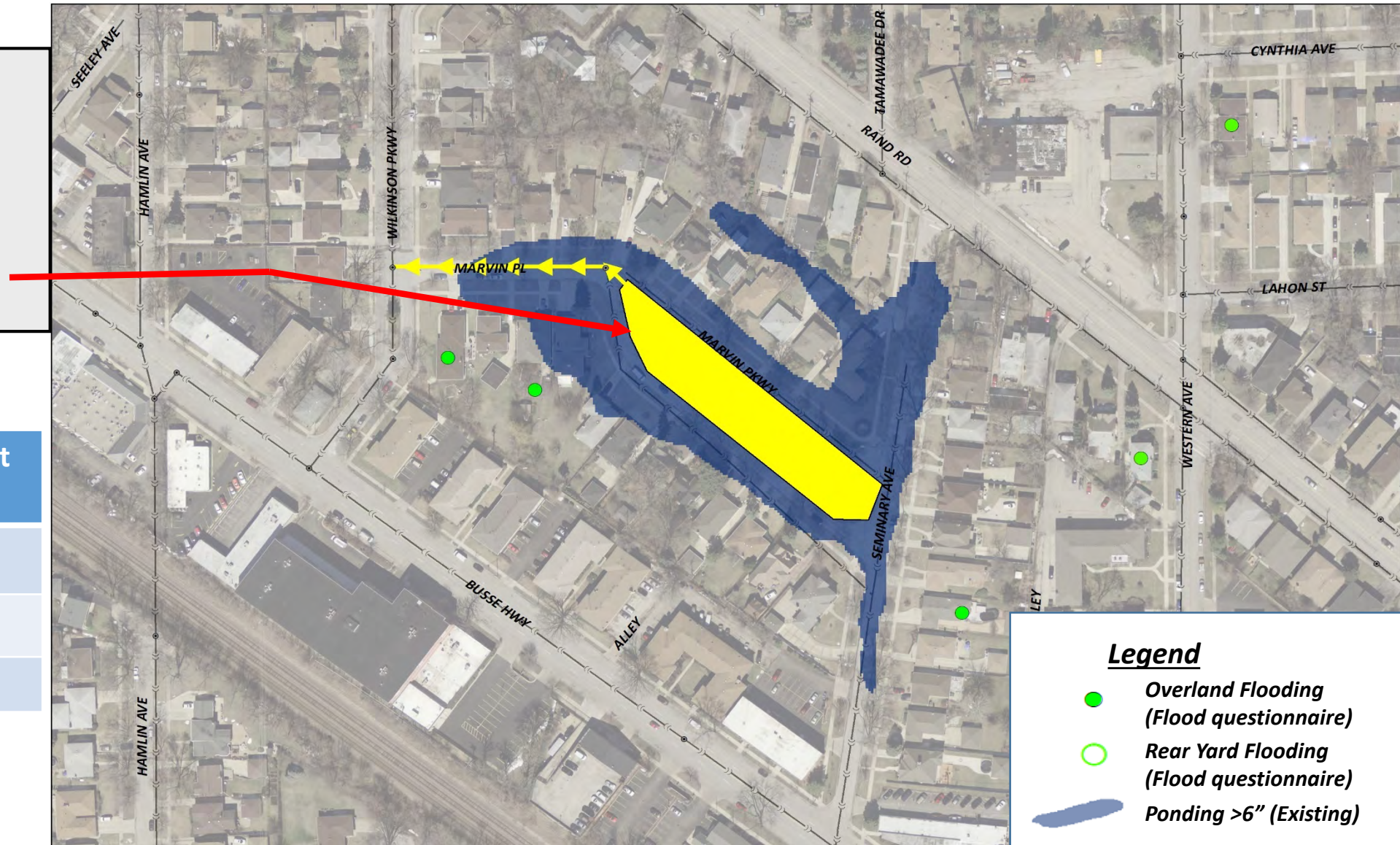
- Overland Flooding
(Flood questionnaire)
- Rear Yard Flooding
(Flood questionnaire)
- Ponding >6" (Existing)



Project – Marvin Parkway (Proposed)

Project Components

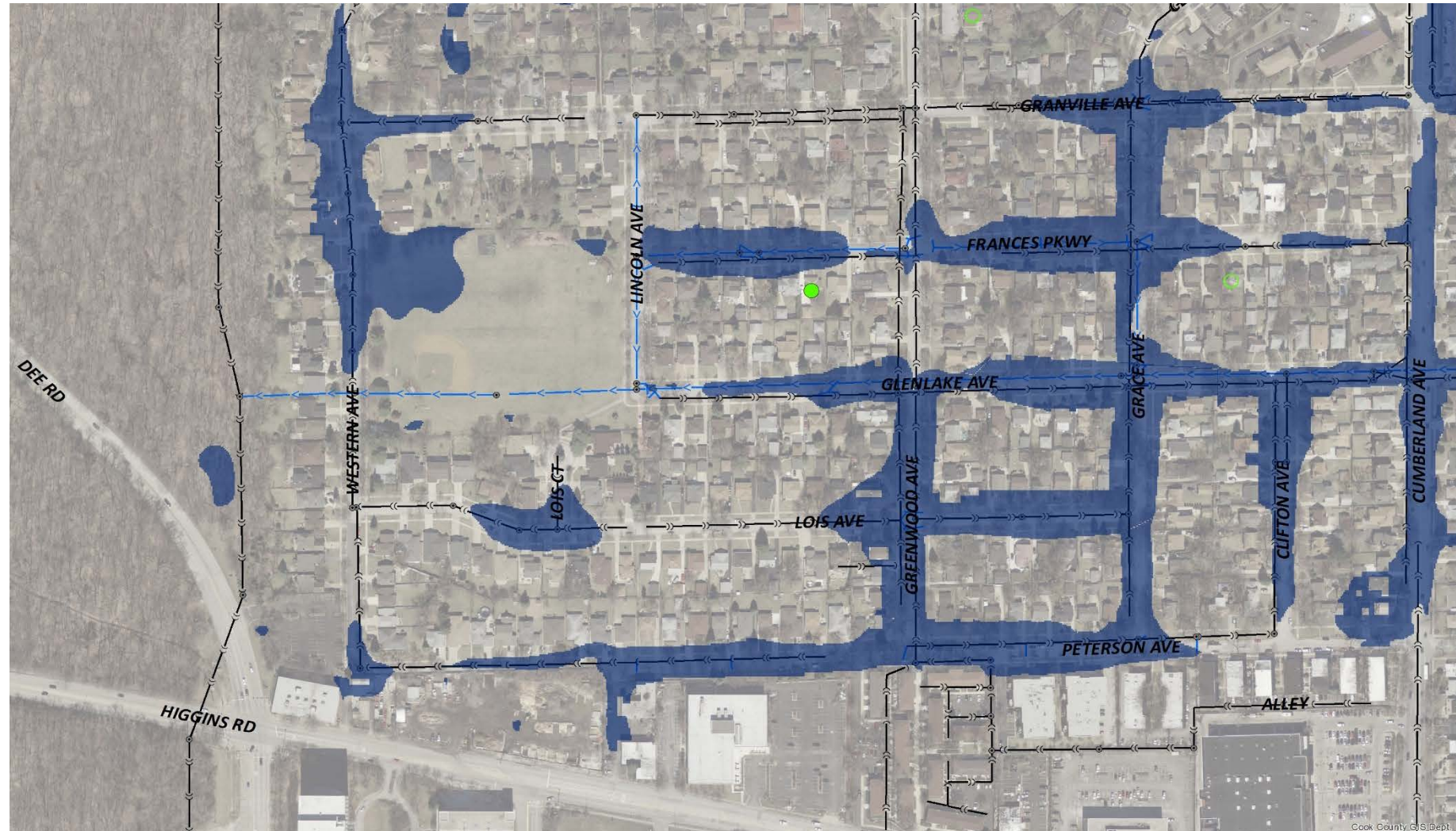
1. Underground Storage
(2-3 ac-ft)



Project – Southwest Park (Existing)

Legend

- Overland Flooding
(Flood questionnaire)
- Rear Yard Flooding
(Flood questionnaire)
- Ponding >6" (Existing)

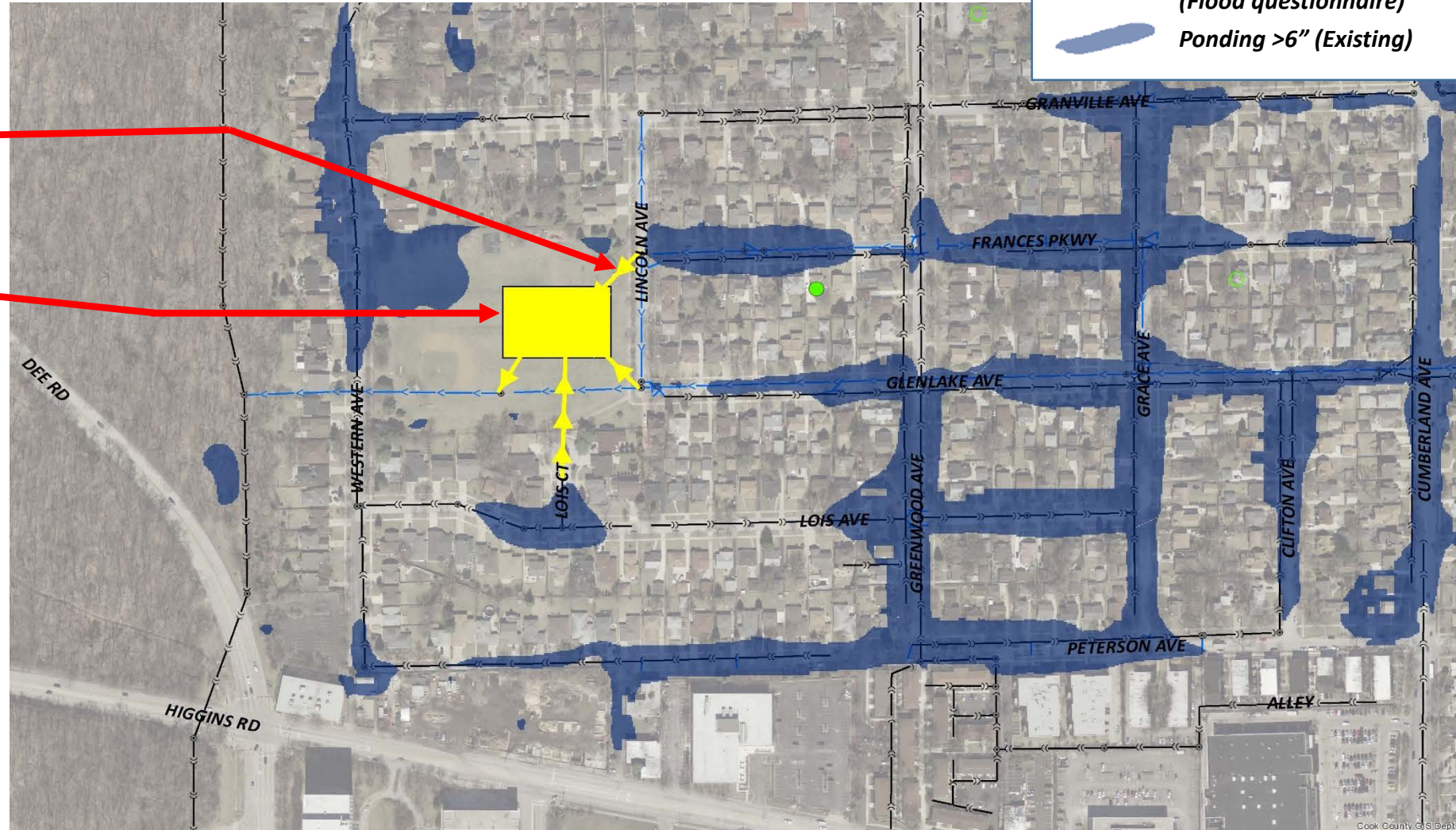


Project – Southwest Park (Proposed)

Project Components

1. Relief Sewers
2. Underground Storage
(3 ac-ft to 5 ac-ft)

Level of Protection	Estimated Cost (2017)
25-year	\$3.1 Million
50-year	\$3.8 Million
100-year	\$4.5 Million



Project – Mayfield

Legend

● Overland Flooding
(Flood questionnaire)

○ Rear Yard Flooding
(Flood questionnaire)

■ Ponding >6" (Existing)



Project – Mayfield (Proposed)

Project Components

1. 36" Storm Sewer
2. Pump Station
(location TBD)
3. Discharge to MWRD
sewer

Level of
Protection

100-year

Estimated Cost (2017)

\$2.5 Million
(plus land acquisition)



Legend

- Overland Flooding
(Flood questionnaire)
- Rear Yard Flooding
(Flood questionnaire)
- Ponding >6" (Existing)

Summary of Projects

Project	Estimated Cost		
	25-yr LOP	50-yr LOP	100-yr LOP
Northeast Park Area	\$5.7 million	\$7.2 million	\$8.8 million
Northwest Park Area	\$15.7 million* (100yr LOP)	\$15.7 million* (100yr LOP)	\$15.7 million (100yr LOP)
Crescent Avenue	\$7.8 million	\$9.8 million	\$12.3 million
Sibley Ave. Storm Sewer	\$12.0 million* (LOP n/a)	\$12.0 million* (LOP n/a)	\$12.0 million* (LOP n/a)
Cherry Street	\$3.9 million	\$4.7 million	\$5.7 million
Milton/Irwin/Babette	\$2.2 million	\$2.2 million	\$2.3 million
PRCC Storage	\$24.6 million	\$29.8 million	\$35.9 million
Delphia/Laverne/Lahon	\$1.9 million	\$1.9 million	\$1.9 million
Austin Street	\$0.5 million	\$0.5 million	\$0.6 million
Hastings Street	\$1.3 million	\$1.5 million	\$1.5 million
Marvin Parkway	\$1.7 million	\$2.3 million	\$2.3 million* (50yr LOP)
Southwest Park Area	\$3.1 million	\$3.8 million	\$4.5 million
Mayfield	\$2.5 million* (100yr LOP)	\$2.5 million* (100yr LOP)	\$2.5 million
TOTAL	\$83 million	\$94 million	\$106 million

\$18.1 - \$20.0 Million

\$28.3 - \$39.9 Million



Stormwater Master Plan Discussion

- Purpose of tonight is to decide LOP and funding level for Overland Flooding projects
- Other general funding categories will be proposed for consideration with final SMP presentation
 - Green Infrastructure projects
 - Private property drainage projects
 - Reverse-slope driveway projects
 - Stormwater Operations and Maintenance



Stormwater Master Plan Discussion

- Including projects in SMP means they will be factored into the Stormwater Utility funding level
- Final SMP will include a recommended order of implementation or phasing of projects
- Projects are not “approved” until City decides to move forward with each project or phase
- **We need direction on the desired funding level to complete the SMP**



Next Steps

- Complete final tasks of Stormwater Master Plan
- Prepare Draft SMP with funding level recommendations
- Final SMP Presentation



Questions?

