Chapter 3

North St. Joseph Creek Watershed

WATERSHED INFRASTRUCTURE IMPROVEMENT PLAN

CHAPTER 3

NORTH ST. JOSEPH CREEK WATERSHED

VILLAGE OF DOWNERS GROVE

DUPAGE COUNTY

Prepared For

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1.0 INTRODUCTION

1.1 Background and Purpose

On October 2, 2006, the Village of Downers Grove experienced a significant rain event which produced 3.77 inches of rain during a one hour period. This rain event was similar to the rainfall depth for the one hour for 100 year storm event. The impact of this storm extended to home and garage flooding, yard and street flooding, widespread power outages, and ponding of water.

Due to this storm and historical flooding, the Village of Downers Grove initiated the development of a stormwater infrastructure improvement plan. This report and associated appendices summarize the results of the Village of Downers Grove Stormwater Infrastructure Improvement Plan (Stormwater Improvement Plan) for the North St. Joseph Creek Watershed. The purpose of the Stormwater Improvement Plan in the North St. Joseph Creek Watershed is to provide the following planning level services:

- determine the 100-year and 10-year Base Flood Elevations (BFEs) of the depressional surface water storage areas (depressional areas) within the North St. Joseph Creek Watershed;
- identify problem drainage areas;
- assess the cause of some of the more severe problem drainage areas;
- recommend adequate stormwater systems through improved infrastructure and conveyance;
- recommend future stormwater projects and implementation procedures to mitigate flooding problems;

1.2 Limitations of Study

This study was performed on a planning level scale and did not include the following:

- hydrologic or hydraulic analysis of St. Joseph Creek or its tributaries, including steady flow modeling, or unsteady FEQ analysis;
- detailed survey of all stormwater systems and facilities;
- wetland field verification or delineation;
- design or construction plans or specifications
- permitting documents;

Additional notes on study limitations and assumptions are provided as necessary in the report and associated appendices.

2.0 PROBLEM AREA IDENTIFICATION

2.1 Problem Area Identification Methodology

2.1.1 Data Sources Reviewed

- Village of Downers Grove GIS layers including, DuPage County 2-foot topographic mapping, aerial photos, streets, corporate limits, right-of-way boundaries, property lines, addresses, depressional areas, parks, schools, and public parking lots.
- Engineering Resource Associates, Inc. topographic survey prepared in April 2007.
- Village of Downers Grove Stormwater Master Plan Update dated October 2006.
- 2005 Village of Downers Grove drainage survey results.
- Village of Downers Grove public meeting comment forms completed by residents in April 2007.
- Village of Downers Grove Drainage Problem Master List updated June 2007.
- Available Village of Downers Grove roadway plans and files.
- October 2, 2006 storm comments and notes compiled by Village of Downers Grove.
- Information obtained during field visits completed in 2007.

2.1.2 Prioritization Method for Drainage Problems and Problem Areas

A comprehensive review of the above data sources, with focus on the resident comments from the Village of Downers Grove Drainage Problem Master list and drainage survey results was completed. A four tiered classification system was established by the Village of Downers Grove Stormwater and Infrastructure Improvement Plan Project Team (Project Team) to classify the large number of drainage problems of residents and is discussed in Sections 2.1.2.1 through 2.1.2.4. Table A.1 in Appendix A, the *Complete List of Reported Drainage Problems in North St. Joseph Creek Watershed*, is a comprehensive list of drainage problems within the subject watershed.

Through the review of the comprehensive list of drainage problems, problem areas were identified for further investigation. Problem areas typically consisted of areas noted by the Village of Downers Grove where repetitive flooding frequently occurred or drainage problems categorized as chronic or critical from the compiled list of drainage problems. The classification of the identified problem areas was based on the same

classification as the drainage problems, described below in Sections 2.1.2.1 through 2.1.2.4.

2.1.2.1 Critical Problems

Critical problems consisted of immediate danger to public health, safety, life, or complete loss of property value; structural damage. This includes any flooding of the first floor of a primary structure, basement flooding of more than 6 inches that resulted from overland flow through a window or door, or garage flooding of more than 7 inches. Problems causing disruption of major traffic routes were also classified as critical.

2.1.2.2 Chronic Problems

Chronic problems were considered less severe than critical not resulting in costly damage or repairs. Included in this category is including shallow street flooding, disruption of minor traffic routes, basement flooding of less than 6 inches resulting from overland flow, garage flooding of less than 7 inches, or yard flooding of more than 12 inches (that is not also associated with structural flooding).

2.1.2.3 Nuisance Problems

Nuisance problems consisted of minor, isolated problems considered less severe than chronic problems, and generally not resulting in damage requiring repair and not caused by surface flooding/drainage problems. Nuisance problems included yard flooding of less than 12 inches; basement flooding resulting from foundation cracks, sump pump failure, seepage or other non-overland causes; or other minor, isolated problems. There were too many nuisance problems reported to address more than a few; however, improvement of chronic and critical problems often helped nuisance problem areas. The minor nuisance problems were not the focus of this study, but they are acknowledged comprehensively in Appendix A Table A.1.

2.2 Problem Areas in North St. Joseph Creek Watershed

2.2.1 Description of Watershed

The St. Joseph Creek Watershed is located between the Lacey Creek Watershed to the north and the Prentiss Creek Watershed to the south and is traversed by the Mainstem of St. Joseph Creek and its North Branch. For the purposes of the Stormwater Improvement Plan, the St. Joseph Creek watershed was divided into a north and south portion for analysis as requested by the Village of Downers Grove. The North St. Joseph Creek Watershed analyzed by CBBEL for the Stormwater Improvement Plan is the area tributary exclusively to the Mainstem of St. Joseph Creek through the Central Business District, the North Branch of St. Joseph Creek, and St. Joseph Creek to the Blodgett Street crossing.

The majority of the Village of Downers Grove encompassed by the North St. Joseph Creek Watershed has been comprised of residential development and local commercial areas since the early 1900's, except for the Maple Grove Forest Preserve and the area west of Belmont which includes the Downers Grove Golf Club. The watershed is drained by roadside ditches, storm sewers, and overland flow swales and contains many depressional areas that collect and detain water.

The North Branch of St. Joseph Creek flows westerly to join the Mainstem of St. Joseph Creek which flows generally east to west through town. The Mainstem of St. Joseph Creek is then conveyed through a large culvert system through the Central Business District, south of the Burlington Northern Sante Fe (BNSF) Railroad, and daylights east of the Maple Grove Forest Preserve. The BNSF Railroad traverses the watershed running east/west parallel to the south side of Warren Avenue, and is perpendicular to the flow of water in the north part of the North St. Joseph Creek Watershed.

The BNSF Railroad runs perpendicular to a large portion of the North St. Joseph Creek Watershed which drains south toward St. Joseph Creek which is located approximately 200 to 1800 feet south of the railroad; therefore, flow is conveyed to St. Joseph Creek at locations where there are culverts under the railroad.

2.2.2 Description of Typical Drainage Problems

Review of the data sources noted in Section 2.1.1 indicated a wide array of drainage problems within the North St Joseph Creek watershed. A comprehensive list of drainage problems is provided in Appendix A Table A.1.

Drainage problems within the North St. Joseph Creek Watershed vary in severity from critical to nuisance, with the majority being nuisance yard flooding. Beyond impacting the use of yards due to flooding, depressional areas and inadequate and poorly directed overland flow

routes can trigger flooding of basements and main floors of primary structures, garages, streets, and sidewalks.

The watershed has three main trunkline storm sewers with lateral storm sewers connecting to them. Some streets are not serviced by storm sewers but are serviced by roadside ditches. Roadway flooding occurs due to undersized or blocked inlets, undersized or lack of storm sewers, and misdirected and undersized overland flow swales and roadside ditches.

In addition to surface and storm sewer drainage issues, the Mainstem and North Branch of St. Joseph Creek cause flooding in the Village of Downers Grove. The creek channel is generally narrow with the floodplain extending beyond the banks, flooding streets, homes, and parks. Floodplain waters also back-up through existing storm sewer and railroad cross culverts. Streambank erosion also degrades or takes away existing land, causing additional debris within the channel and water quality impacts.

2.2.3 Map Showing Problem Areas

A Watershed Map showing the problem areas identified within the North St. Joseph Creek Watershed is provided in this section.

The Watershed Map follows.

2.2.4 Existing Problem Areas in North St. Joseph Creek Watershed

A list of existing problem areas is provided as Table 2.1.

Table 2.1 follows.

Table 2.1: Problem Areas in the North St. Joseph Creek Watershed

Problem Area ID	Sub-watershed ID	Location	Comment Data Source	Problem Area Description							Severity*	Description/Comments
				House	Base-ment	Garage	Yard	Street	Depr. Area	Other		
		Intersection/general location description	*Village Records, 1996 Flood Records, 2006 Flood Records, 2005 Resident Questionnaire, Other*								*Critical, Chronic or Nuisance*	
SJN26	SJN-B	At Pershing east of Arbor between Ogden and Grant	2005 Questionnaire, 2006 Flood Records		x		x	x	x		Nuisance	Depressional area, drainage ditch grading, wetland
SJN35	SJN-C	At Warren between Cornell and Northcott	2005 Questionnaire, 2006 Flood Records, Village Records	x	x	x	x	x	x		Nuisance, Chronic	Depressional area, yard, basement flooding
SJN39	SJN-C	Southeast of Chicago between Northcott and Wallbank	Village Records	x					x		Critical	house flooding
SJN40	SJN-C	At Warren and Wallbank	2005 Questionnaire, 2006 Flood Records, Village Records	x	x		x	x	x		Nuisance, Critical	Depressional area, house flooding
SJN41/45	SJN-C	Northwest of Seeley and Chicago	2005 Questionnaire, 2006 Flood Records, Village Records		x		x	x	x		Nuisance	Depressional area, street flooding
SJN53/54	SJN-C	East of Oakwood between Grant and Chicago	2005 Questionnaire, 2007 Public Meeting				x		x		Chronic	Depressional area
SJN67	SJN-D	Souteast of Grant and Saratoga	2005 Questionnaire, 2006 Flood Records, Village Records	x	x			x			Nuisance, Chronic	Depressional area, house flooding
SJN73	SJN-I	North of Blanchard between Brookbank and Carpenter	2005 Questionnaire, 2007 Public Meeting		x		x		x		Nuisance	Depressional area
SJN79	SJN-D	Between Main and Highland south of Chicago	2005 Questionnaire		x	x	x		x		Nuisance	Depressional area
SJN82/83/92/94	SJN-E	Between Rogers and Franklin and between Highland and Washington	2005 Questionnaire, 2006 Flood Records, Village Records	x	x	x	x	x	x		Nuisance, 3 Chronic	Depressional area, house flooding
SJN86	SJN-D	Northwest of Chicago and Washington	2005 Questionnaire, 2006 Flood Records, Village Records	x	x	x	x		x		Nuisance, 1 Chronic	Depressional area, basement, garage flooding
SJN99/103/105	SJN-E	West of Stanley between Lincoln and Sherman	2005 Quest., 2006 Flood Rec., 2007 Public Mtg.	x	x		x	x	x		Nuisance, Chronic	Depressional area, storm sewer, street drainage
SJN100/108	SJN-E	Between Prospect and Stanley north of Sherman	2005 Questionnaire	x	x	x	x	x	x		Nuisance, 1 Chronic	Depressional area, garage, house flooding
SJN104	SJN-E	At southwest corner of Chicago and Debolt	2005 Questionnaire, 2006 Flood Records		x		x	x	x		Nuisance, 1 Chronic	Depressional area
SJN110	SJN-E	Between Stanley and Sterling north of Chicago	2005 Questionnaire, Village Records		x		x	x	x		Nuisance	Depressional area
SJN175	FP	Between Saratoga and Forest north of Warren	2006 Questionnaire, Village Records		x					x		Due to floodplain of St. Joseph Creek
SJN183/112	SJN-J	South of Randall between Blodgett and Fairmount	2005 Questionnaire, 2006 Flood Records	x	x		x	x	x		Nuisance, 3 Critical	Depressional area
SJN501	SJN-B	East of Pershing north of Warren	2005 Quest., 2006 Flood Rec., 2007 Public Mtg.		x		x	x			Nuisance	Due to overland flow
SJN502	SJN-B	West of Woodward north of Warren	2005 Questionnaire	x	x	x	x				Nuiscance, 1 Chronic, 1 Critical	Due to overland flow
SJN503	SJN-B	Hitchcock between Cornell and Glenview	2005 Questionnaire, 2006 Flood Records		x	x	x	x			Nuisance, 2 Chronic	Street flooding
SJN504	FP	Curtis east and west of Chase	2005 Flood Records					x		x		Due to floodplain of St. Joseph Creek
SJN505	FP	Curtis between Glenview and Cornell	2005 Questionnaire, 2006 Flood Records		x		x	x		x		Due to floodplain of St. Joseph Creek
SJN506	FP	Lee Street north of Elmore	2005 Questionnaire, 2006 Flood Records				x	x		x		Due to floodplain of St. Joseph Creek
SJN507	FP	Jacqueline Drive at St. Joseph Creek	2005 Questionnaire, 2007 Public Meeting				x	x		x		Due to floodplain of St. Joseph Creek
SJN508	SJN-C	Montgomery north of Warren	2005 Questionnaire, 2006 Flood Records	x	x	x	x	x			Nuisance	
SJN509	SJN-D	Linscott north of Franklin	2005 Questionnaire		x		x				Nuisance	8 Resident Comments
SJN510	FP	Gilbert west of Carpenter	2005 Questionnaire, 2006 Flood Records	x	x		x	x		x		12 Resident Comments, Due to floodplain
SJN511	FP	Gilbert east of Carpenter	2005 Questionnaire, 2006 Flood Records		x		x	x		x		Due to floodplain of St. Joseph Creek
SJN512	SJN-E	Between Highland and Washington North of Franklin	2005 Questionnaire, 2006 Flood Records	x	x	x	x	x			Nuisance	Related to SJN 82/83
SJN513	SJN-F	Davis and Fairview	2005 Questionnaire, 2006 Flood Records		x		x	x			Nuisance	Inlet maintenance
SJN514	SJN-F	Cumnor and Shady Lane	2005 Questionnaire, 2006 Flood Records, Village Records	x	x		x	x			Nuisance, Chronic	
SJN515	FP	Along North Branch St. Joseph Creek between Florence and Cumnor	2006 Flood Records, Floodplain Map					x		x		Due to floodplain of St. Joseph Creek
SJN516	FP	Around Fairview and St. Joseph Creek	2005 Questionnaire	x	x		x	x		x		Due to floodplain of St. Joseph Creek
SJN517	FP	Blodgett and Randall adjacent to St. Joseph Creek	2005 Questionnaire		x	x						Due to floodplain of St. Joseph Creek

Notes: A complete list of all reported problems, including all nuisance problems, is included in Appendix A.

Due to large number of depressional areas within the North st. Joseph Creek Watershed, not all were included in this table, only more severe ares listed here.

Subwatershed ID of FP means that the problem area is associated with the floodplain of St. Joseph Creek. Detailed analysis of floodplain areas was not included in the Improvement Plan.

3.0 HYDROLOGIC AND HYDRAULIC METHODS

3.1 Introduction

XP-SWMM Stormwater and Wastewater Model Modeling Software Version 10 was used to determine the 100- and 10-year BFE of each depressional area and analyze problem areas within the North St. Joseph Creek Watershed. XP-SWMM is a dynamic unsteady flow model that calculates the effects of storage and backwater in conduits and floodplains and the timing of the simulated hydrographs by simulating natural rainfall-runoff processes and the performance of engineered stormwater systems that manage water resources.

3.2 Hydrologic Methods

DuPage County two-foot topographic mapping was used to delineate the North St. Joseph Creek Watershed into 10 subwatersheds based on existing conditions overland flow drainage. Each subwatershed was further broken down into smaller subbasins as shown on the North St. Joseph Creek Watershed Map in Section 2.2.3. The drainage area within each subbasin was measured using an electronic planimeter. The Runoff Curve Number was calculated based on TR-55 methodology assuming Hydrologic Soil Group C representing the landuse conditions in association with the Village of Downers Grove Future Land Use Map dated December 2006. The Time of Concentration for various subwatershed sizes was determined using TR-55 methodology and applied to subwatersheds of similar areas. The calculation for the slope value for the Time of Concentration calculation was based on DuPage County two-foot topographic mapping. A summary of the drainage area, Runoff Curve Number, and Time of Concentration for each subbasin is provided in Appendix B.

The rainfall depths used in the runoff layer of the XP-SWMM analysis were taken from the Illinois State Water Survey (ISWS) Bulletin 71 in conjunction with the Huff rainfall distributions to develop the inflow hydrographs for the existing subareas. Table 1 summarizes the 100-year and 10-year rainfall depths used in the hydrologic analysis.

Table 1
Summary of ISWS Bulletin 71 Rainfall Depths for 100-Year and 10-year Storm Events

Storm Event Duration	1-hour	2-hour	3-hour	6-hour	12-hour	18-hour	24-hour	48-hour
10-Year Rainfall Depth (inches)	2.10	2.64	2.86	3.35	3.89	4.11	4.47	4.81
100-Year Rainfall Depth (inches)	3.56	4.47	4.85	5.68	6.59	6.97	7.58	8.16

Note: The October 2, 2006 storm event which produced 3.77 inches of rain during a one hour period.

The XP-SWMM analysis used the 100-year and 10-year rainfall depths summarized in Table 1 and the appropriate Huff rainfall distributions corresponding to the 1-, 2-, 3-, 6-, 12-, 24- and 48-hour duration events. The 1-, 2-, 3- and 6-hour events are represented by the Huff 1st quartile rainfall distribution; the 12-hour event is represented by the Huff 2nd quartile rainfall distribution; the 18- and 24-hour events are represented by the Huff 3rd quartile rainfall distribution; and the 48-hour event is represented by the Huff 4th quartile rainfall distribution. Additionally, the October 2, 2006 storm event data obtained from the Village of Downers Grove was used to simulate conditions occurring during the notable October 2, 2006 storm. This rain event was similar to the rainfall depth for the one hour 100 year storm event.

3.3 Hydraulic Methods

The major stormwater system components were analyzed using XP-SWMM dynamic modeling; however, due to the level of this planning level study, not every overland flow path, drainage swale, ditch, stormwater facility, storm sewer, or stormwater appurtenance was modeled. The XP-SWMM analysis was completed to provide an overall picture of drainage within the North St. Joseph Creek Watershed concentrating on problematic areas of drainage.

Due to the complex drainage system of the North St. Joseph Creek Watershed, the watershed was divided into four XP-SWMM analyses (west, east1, east2, and south). Each XP-SWMM analysis incorporated storm sewer information such as pipe size, material, length, slope, and invert elevations based on survey or available information from the Village of Downers Grove. Pipe lengths and overland flow paths were combined to consolidate modeling

input when possible. In instances where the storm sewer information was not surveyed, the best available storm sewer information from the Village was used and supplemented by field verifications, when possible, to determine the pipe size. The invert was determined by assuming 2 to 3 feet minimum of cover over the pipe. When the pipe material was not available, the pipe was assumed to be Reinforced Concrete Pipe (RCP).

Depressional area storage volume was calculated based on measurements from the DuPage County 2-foot topographic mapping, while outlets and overflow elevations were based on survey information. If survey information was not available, the best available information from the Village was used, supplemented by field verifications when possible, to determine the outlet characteristics of a depressional area.

When tailwater from the Mainstem or North Branch of St. Joseph Creek was a consideration in the hydraulic model, the 10-year water surface elevation was taken from the Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) profile and utilized in the analysis.

3.4 Calibration Methods

The XP-SWMM hydraulic models were calibrated to the October 2, 2006 rainfall data provided by the Village of Downers Grove. The peak elevation for the October storm event at each depressional area was taken from Downers Grove 2-foot topographic survey data and specific depressional area studies performed as part of previous projects within the Village of Downers Grove. Through an iterative process of fine-tuning drainage parameters, the XP-SWMM analysis was calibrated to the October 2, 2006 High Water Levels (HWL) surveyed for a few depressional areas within the North St. Joseph Creek Watershed, typically within 0.3 feet. A few depressional areas with surveyed HWLs resulted in lower or higher peak elevations in excess of 0.3 feet based on the XP-SWMM analyses.

4.0 EXISTING CONDITION ANALYSIS

4.1 Introduction

The existing condition BFE and problem area analyses were performed in XP-SWMM according to the methodology described in Section 3 of this Chapter. The results of the existing condition problem area analyses are summarized in Table 4.1 and the 100- and 10-year BFEs of the depressional areas are provided in Table 4.2. Details regarding the existing conditions BFE and problem area analyses are provided in Appendix A. Supporting calculations are provided in Appendix B and the XP-SWMM analyses are provided on the CD-ROM in Appendix C.

4.2 North St. Joseph Creek Watershed

4.2.1 Existing Condition Problem Area Results in North St. Joseph Creek Watershed

Table 4.1 follows.

Table 4.1: Existing Condition Problem Area Results in North St. Joseph Creek Watershed

Problem Area ID	Sub-watershed ID	Location	Problem Area Description							Severity	Problem Source
			House	Base-ment	Garage	Yard	Street	Depr. Area	Other		
		Intersection/general location description								*Critical, Chronic or Nuisance*	
SJN26	SJN-B	At Pershing east of Arbor between Ogden and Grant		x		x	x	x		Nuisance	inadequate storm sewer
SJN35	SJN-C	At Warren between Cornell and Northcott	x	x	x	x	x	x		Nuisance, Chronic	inadequate storm sewer and stormwater storage
SJN39	SJN-C	Southeast of Chicago between Northcott and Wallbank						x		Critical	inadequate storm sewer and stormwater storage
SJN40	SJN-C	At Warren and Wallbank	x	x		x	x	x		Nuisance, Critical	inadequate storm sewer and stormwater storage
SJN41/45	SJN-C	Northwest of Seeley and Chicago		x		x	x	x		Nuisance	inadequate storm sewer
SJN53/54	SJN-C	East of Oakwood between Grant and Chicago				x		x		Chronic	no outlet of depressional area
SJN67	SJN-D	Souteast of Grant and Saratoga	x	x			x	x		Nuisance, Chronic	undersized depressional area outlet
SJN73	SJN-I	North of Blanchard between Brookbank and Carpenter		x		x		x		Nuisance	no outlet of depressional area
SJN79	SJN-D	Between Main and Highland south of Chicago		x	x	x		x		Nuisance	no outlet of depressional area
SJN82/83/92/94	SJN-E	Between Rogers and Franklin and between Highland and Washington	x	x	x	x	x	x		Nuisance, 3 Chronic	inadequate subwatershed storage
SJN86	SJN-D	Northwest of Chicago and Washington	x	x	x	x		x		Nuisance, 1 Chronic	undersized depressional area outlet
SJN99/103/105	SJN-E	West of Stanley between Lincoln and Sherman	x	x		x	x	x		Nuisance, Chronic	no outlet of depressional area, overland flow
SJN100/108	SJN-E	Between Prospect and Stanley north of Sherman	x	x	x	x	x	x		Nuisance, 1 Chronic	no designated overland flow route, inadequate storm sewer
SJN104	SJN-E	At southwest corner of Chicago and Debolt		x		x	x	x		Nuisance, 1 Chronic	no designated overland flow route, inadequate storm sewer
SJN110	SJN-E	Between Stanley and Sterling north of Chicago		x		x	x	x		Nuisance	inadequate subwatershed storage
SJN175	FP	Between Saratoga and Forest north of Warren		x					x		floodplain of St. Joseph Creek
SJN183/112	SJN-J	South of Randall between Blodgett and Fairmount	x	x		x	x	x		Nuisance, 3 Critical	
SJN501	SJN-B	East of Pershing north of Warren		x		x	x			Nuisance	no designated overland flow route
SJN502	SJN-B	West of Woodward north of Warren	x	x	x	x				Nuiscance, 1 Chronic, 1 Critical	no designated overland flow route
SJN503	SJN-B	Hitchcock between Cornell and Glenview		x	x	x	x			Nuisance, 2 Chronic	no designated overland flow route, inadequate storm sewer
SJN504	FP	Curtis east and west of Chase					x		x		floodplain of St. Joseph Creek
SJN505	FP	Curtis between Glenview and Cornell		x		x	x		x		floodplain of St. Joseph Creek
SJN506	FP	Lee Street north of Elmore				x	x		x		floodplain of St. Joseph Creek
SJN507	FP	Jacqueline Drive at St. Joseph Creek				x	x		x		floodplain of St. Joseph Creek
SJN508	SJN-C	Montgomery north of Warren	x	x	x	x	x			Nuisance	no designated overland flow route, inadequate storm sewer
SJN509	SJN-D	Linscott north of Franklin		x		x				Nuisance	inadequate storm sewer
SJN510	FP	Gilbert west of Carpenter	x	x		x	x		x		floodplain of St. Joseph Creek
SJN511	FP	Gilbert east of Carpenter		x		x	x		x		floodplain of St. Joseph Creek
SJN512	SJN-E	Between Highland and Washington North of Franklin	x	x	x	x	x			Nuisance	
SJN513	SJN-F	Davis and Fairview		x		x	x			Nuisance	
SJN514	SJN-F	Cumnor and Shady Lane	x	x		x	x			Nuisance, Chronic	inlet replacement and maintenance
SJN515	FP	Along North Branch St. Joseph Creek between Florence and Cumnor					x		x		floodplain of St. Joseph Creek
SJN516	FP	Around Fairview and St. Joseph Creek	x	x		x	x		x		floodplain of St. Joseph Creek
SJN517	FP	Blodgett and Randall adjacent to St. Joseph Creek		x	x						floodplain of St. Joseph Creek

Notes: A complete list of all reported problems, including all nuisance problems, is included in Appendix A.

Due to large number of depressional areas within the North st. Joseph Creek Watershed, not all were included in this table, only more severe ares listed here.

Subwatershed ID of FP means that the problem area is associated with the floodplain of St. Joseph Creek. Detailed analysis of floodplain areas was not included in the Improvement Plan.

4.2.2 Depressional Area BFEs in North St. Joseph Creek Watershed

Table 4.2 follows.

Table 4.2: Depressional Area BFEs in North St. Joseph Creek Watershed

Depressional Area ID	Location	BFE		Comments
		100-yr	10-yr	
SJN# / SJ#	*Intersection/general location description*			
SJN23	Southwest of Ogden and Drendel	722.4	720.8	
SJN24	Southeast of Ogden and Cross	734.3	734.1	
SJN25	At Puffer between Chicago and Prairie	734.2	734.1	
SJN26/28	At Pershing east of Arbor between Ogden and Grant	745.4	743.6	
SJN27	At southwest corner of Prairie and Belmont	734.2	734.1	
SJN29	North of Chicago between Wilson and Belmont	736.2	732.9	
SJN30	Between Hitchcock and Curtiss east of Belmont	–	–	Floodplain, remove depressional area designation.
SJN31	Northeast of Prairie and Pershing	726.9	720.7	
SJN32	At Stonewall north of Warren	706.2	706.0	
SJN33	South of Chicago between Stonewall and Cornell	734.8	732.4	
SJN34	Northwest of Chicago and Lee	737.1	735.4	
SJN35	At Warren between Cornell and Northcott	702.2	702.1	
SJN36	South of Main Stem St. Joseph Creek east of Lee	–	–	Remove depressional area designation.
SJN37	South of Main Stem St. Joseph Creek east of Lee	–	–	Remove depressional area designation.
SJN39	Southeast of Chicago between Northcott and Wallbank	726.3	724.9	
SJN40	At Warren and Wallbank	703.3	702.1	
SJN41	Northeast of Wallbank and Chicago	728.3	728.2	
SJN42	Southwest of Prairie and Oakwood	724.3	724.2	
SJN43	North of Gilbert and Jacqueline	698.5	697.0	
SJN45	At Seeley north of Chicago	726.8	723.2	
SJN46	North of Chicago between Seeley and Oakwood	722.9	722.5	
SJN47	At Gilbert west of Dewitt	707.2	707.1	
SJN48	Northwest of Prairie and Montgomery	720.6	720.3	
SJN49	Northwest of Dewitt and Gilbert	706.4	705.2	
SJN50	North of Chicago between Seeley and Oakwood	722.8	722.6	
SJN52	Northeast of Dewitt and Gilbert	–	–	Remove depressional area designation.
SJN53	East of Oakwood between Grant and Chicago	729.3	729.1	
SJN54	East of Oakwood between Grant and Chicago	728.4	728.2	
SJN55	South of 55th between Dunham and Middaugh	736.1	735.1	
SJN56	North of Blanchard between Dunham and Middaugh	750.1	746.5	
SJN58	Northwest of Jefferson and Middaugh	745.5	745.2	
SJN59	Between Middaugh and Linscott north of Chicago	730.4	729.1	
SJN60	Between Linscott and Parkway south of Franklin	710.2	709.3	
SJN61	West of Brookbank south of Maple	728.2	728.2	
SJN62	East of Brookbank south of Maple	726.5	726.0	
SJN63	South of 55th between Middaugh and Brookbank	726.3	726.2	
SJN65	Southwest of Bainchard and Brookbank	743.3	743.2	
SJN66	East of Brookbank south of Maple	728.3	728.2	
SJN67	Souteast at Grant and Saratoga	736.2	736.1	
SJN68	East of Brookbank south of Maple	726.5	726.2	
SJN69	West of Maple and Carpenter	719.6	714.0	
SJN70	Between Prince and highland south of Sherman	736.7	735.5	
SJN71	At Franklin and Prince	720.2	718.1	
SJN72	West of Maple and Carpenter	721.7	721.3	
SJN73	Beteen Brookbank and Carpenter south of 55th	724.7	724.2	
SJN74	East of Maple and Carpenter	725.9	725.0	
SJN75	West of Main south of Janet	743.4	743.1	
SJN76	East of Main south of Janet	–	–	Remove depressional area designation.
SJN77	At 41st between Main and Highland	745.5	742.4	
SJN78	Between Main and Rogers north of Warren	710.3	708.3	
SJN79	Between Main and Highland south of Chicago	736.5	735.2	
SJN80	Southwest of Maple and Main	–	–	Remove depressional area designation.
SJN81	North of Highland and Grant	736.7	735.5	
SJN82	Between Fairmount and Benton north of Randall	710.3	708.3	
SJN83	Between Rogers and Franklin and between Highland and Washington	710.3	708.3	
SJN86	Northwest at Chicago and Washington	730.2	729.6	
SJN90	On Washington north of Grant	736.7	735.0	
SJN92	Between Washington and Whiffen north of Rogers	714.7	714.4	
SJN93	Southwest of Randall and Lyman	724.4	723.1	
SJN94	Northwest of Rogers and Elm	714.7	714.4	
SJN96	South of Randall between Lyman and Park	724.4	723.1	

Table 4.2: Depressional Area BFEs in North St. Joseph Creek Watershed

Depressional Area ID	Location	BFE		Comments
		100-yr	10-yr	
SJN97	Southwest of Lincoln and Prospect	728.3	728.2	
SJN99	Southwest of Grant and Stanley	730.2	730.0	
SJN100	Northwest corner of Sherman and Prospect	736.5	736.2	
SJN101	Between Earlston and Stanley north of Ogden	740.1	740.0	
SJN103	Northwest of Grant and Stanley	732.1	732.0	
SJN104	At southwest corner of Chicago and Debolt	725.7	718.7	
SJN105	Southwest of Grant and Stanley	729.8	728.7	
SJN106	South of Chicago between Prospect and Stanley	723.9	721.2	
SJN107	Northeast of Chicago and Prospect	725.7	718.7	
SJN108	West of Stanley north of Sherman	736.5	736.2	
SJN109	East of Stanley north of Sherman	--	--	Remove depressional area designation.
SJN110	Between Stanley and Sterling north of Chicago	728.0	723.8	
SJN111	Southeast of Rogers at Linden	--	--	Floodplain, remove depressional area designation.
SJN112	West of Benton between Randall and Summit	716.7	716.2	
SJN113	Northeast of Franklin and	729.0	728.7	
SJN117	On Lake west of Fairview	763.9	763.0	
SJN119	Northeast of Otis and Fairview	742.8	742.7	
SJN120	Northwest of Lincoln and Cumnor	740.1	739.9	
SJN122	West of 41st and Cumnor	750.4	750.0	
SJN126	On Westend north of 41st	746.8	742.9	
SJN127	At Roslyn and 41st	742.4	741.8	
SJN159	At Tower and Roslyn	748.7	746.9	
SJN183	South of Randall between Blodgett and Fairmount	716.7	715.6	

Note: Base Flood Elevation (BFE) is presented in feet with respect to the DuPage County datum.

5.0 PROPOSED STORMWATER PROJECT ANALYSIS

5.1 Introduction

The proposed condition problem area analyses were performed in XP-SWMM according to the methodology described in Section 3 of this Chapter. The proposed stormwater projects were designed such that together there would be no increase in flow to St. Joseph Creek. Analysis of the interaction of the proposed stormwater projects with St. Joseph Creek could be completed in the future to determine if an increase in flowrate to St. Joseph Creek would be acceptable; therefore, allowing additional outflow to the creek. Additional survey information and detailed analyses should be performed in the future to provide support for design, permitting, and construction of proposed stormwater projects.

The results of the proposed condition problem area analyses are summarized in Table 4.1 and the 100- and 10-year BFEs of the depressional areas are provided in Table 4.2. Details regarding the proposed conditions problem area analyses are provided in Appendix A. Supporting calculations are provided in Appendix B and the XP-SWMM analyses are provided on CD-ROM in Appendix C.

5.2 Prioritization Method

To assist in prioritization of stormwater projects to evaluate for improvement and analysis, the critical and chronic problem areas were grouped as follows: critical problem areas were categorized as high priority, chronic problem area as moderate priority, and nuisance problem areas as low priority. Problem areas and drainage problems categorized as nuisance flooding were not excluded from the analysis; however, not all nuisance areas were evaluated. Consideration was also given to historical data, Village of Downers Grove staff input, resident comments, and modeling results during the prioritization process. Problem areas associated with St. Joseph Creek were included as problem area; however, they were not prioritized as high, moderate, or low because detailed analysis of the floodplain of St. Joseph Creek was not included in the Improvement Plan.

5.3 North St. Joseph Creek Watershed

5.3.1 Stormwater Projects in North St. Joseph Creek Watershed

Table 5.1 follows.

Table 5.1: Stormwater Projects Per Subwatershed in North St. Joseph Creek Watershed

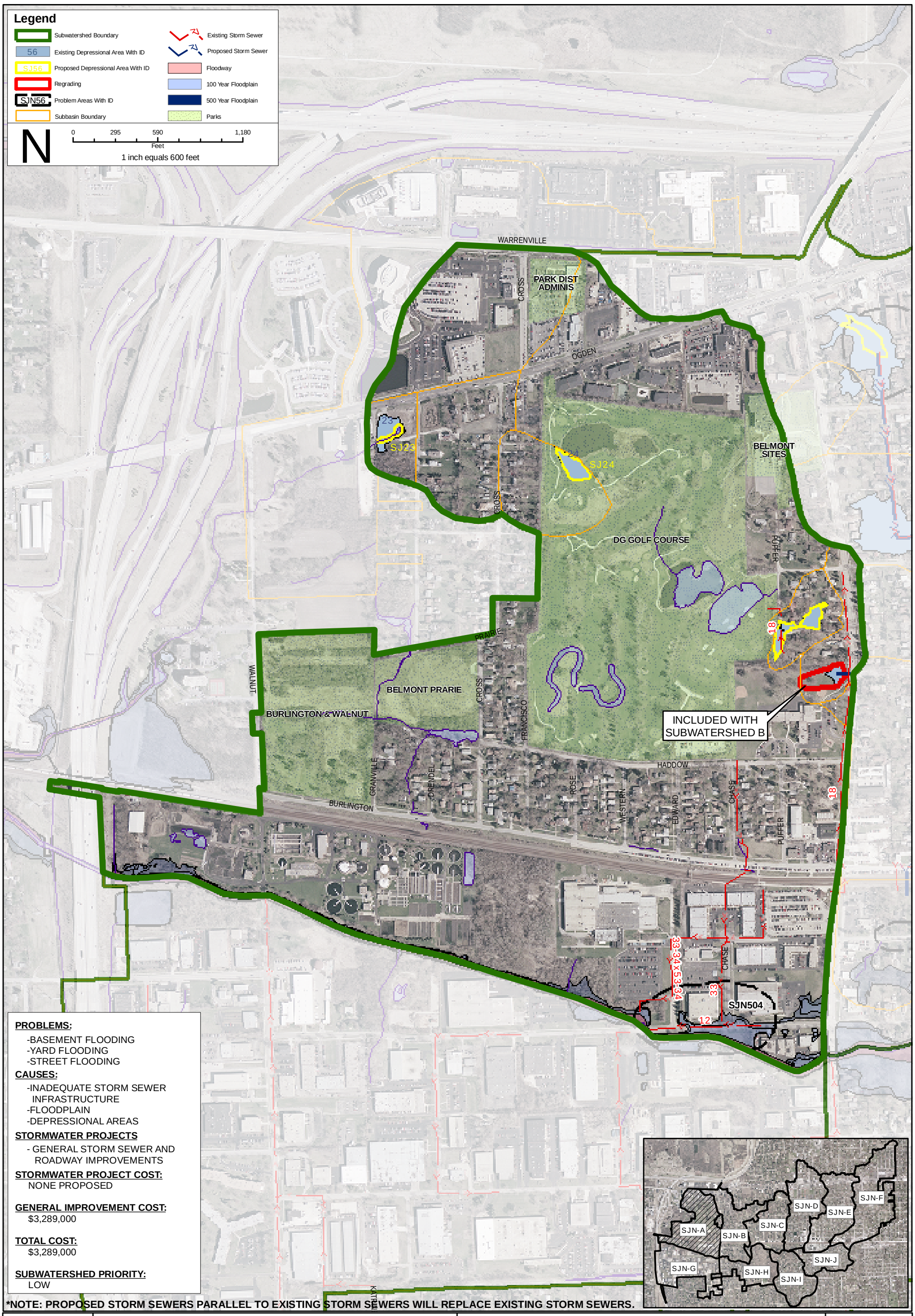
Subwatershed ID	Problem Area ID	Problem Area Location	Problem Area Severity	Stormwater Project Description Per Subwatershed	Potential Wetland Impacts	Easment Issues	Permit Requirements	Estimated Construction Schedule
		Intersection/general location description	*High, Moderate, Low*		*Yes, No*		*USACOE, DG, EDP*	
SJN-A	*None Identified*	West of Belmont north of St. Joseph Creek	*None Identified*	*No problem areas identified.*	*N/A*	*N/A*	*N/A*	N/A
SJN-B	SJN26	At Pershing east of Arbor between Ogden and Grant	Moderate	grade stormwater storage basin, increase storm sewer from 48" to 54", add 48" storm sewer, regrade depressional area, provide outlet for depressional area	Yes, associated with SJN26	Loy Park, rear yards of storm sewer replacement, depressional area outlet	USACOE, DG	24 months
	SJN501	East of Pershing north of Warren	Low					
	SJN502	West of Woodward north of Warren	Moderate					
	SJN503	Hitchcock between Cornell and Glenview	Moderate					
SJN-C	SJN35	At Warren between Cornell and Northcott	High	grade stormwater storage basin, increase storm sewer size, add storm sewer, regrade depressional areas, provide outlet for depressional areas	No	stormwater storage basin, depressional area modification	DG	20 months
	SJN39	Southeast of Chicago between Northcott and Wallbank	High					
	SJN40	At Warren and Wallbank	High					
	SJN41/45	Northwest of Seeley and Chicago	Low					
	SJN53/54	East of Oakwood between Grant and Chicago	Moderate					
	SJN508	Montgomery north of Warren	Low					
SJN-D	SJN67	Souteast of Grant and Saratoga	Moderate	provide outlets or enhance existing outlets of depressional areas	No	depressional area outlets	DG	12 months
	SJN79	Between Main and Highland south of Chicago	Low					
	SJN86	Northwest of Chicago and Washington	Moderate					
	SJN509	Linscott north of Franklin	Low					
SJN-E	SJN82/83	Between Rogers and Franklin and between Highland and Washington	High	grade stormwater storage basins, increase storm sewer, add control/diversion structure, provide outlet for depressional areas	No	Washington park, depressional area outlets	DG	24 months
	SJN92/94	Between Washington and Elm north of Rogers	High					
	SJN99/103/105	West of Stanley between Lincoln and Sherman	Moderate					
	SJN100/108	Between Prospect and Stanley north of Sherman	Moderate					
	SJN104	At southwest corner of Chicago and Debolt	Moderate					
	SJN110	Between Stanley and Sterling north of Chicago	Low					
	SJN512	Between Highland and Washington North of Franklin	Moderate					
SJN-F	SJN513	Davis and Fairview	Low	add, replace, and maintain inlets	No	N/A	DG	6 months
	SJN514	Cumnor and Shady Lane	Moderate					
SJN-G	*None Identified*	West of Belmont south of St. Joseph Creek	*None Identified*	*No problem areas identified.*	*N/A*	*N/A*	*N/A*	*N/A*
SJN-H	*None Identified*	East of Belmont West of Maple Grove Forest Preserve south of St. Joseph Creek	*None Identified*	*No problem areas identified.*	*N/A*	*N/A*	*N/A*	*N/A*
SJN-I	SJN73	North of Blanchard between Brookbank and Carpenter	Low	regrade depressional area, provide outlet for depressional areas	Yes, associated with SJN73	depressional area modification	USACOE, DG	16 months
SJN-J	SJN183/112	South of Randall between Blodgett and Fairmount	High	voluntary buy-out program, grade stormwater storage basin	No		DG	20 months

Notes:

Projects or improvements associated with the floodplain of St. Joseph Creek are not included in this table.

Estimated construction schedule based on Project Schdule outline in Tab 2 of Appendix B.

5.3.2 Subwatershed Exhibits



PROBLEMS:

- -BASEMENT FLOODING
- -YARD FLOODING
- -STREET FLOODING

CAUSES:

- -INADEQUATE STORM SEWER INFRASTRUCTURE
- -FLOODPLAIN
- -DEPRESSIONAL AREAS

STORMWATER PROJECTS

- GENERAL STORM SEWER AND ROADWAY IMPROVEMENTS

STORMWATER PROJECT COST:

NONE PROPOSED

GENERAL IMPROVEMENT COST:

$3,289,000

TOTAL COST:

$3,289,000

SUBWATERSHED PRIORITY:

LOW

***NOTE: PROPOSED STORM SEWERS PARALLEL TO EXISTING STORM SEWERS WILL REPLACE EXISTING STORM SEWERS.**

Village of DOWNERS GROVE FOUNDED IN 1832

CHRISTOPHER B. BURKE ENGINEERING LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

TITLE:

NORTH ST. JOSEPH CREEK WATERSHED
SJN-A SUBWATERSHED

PROJ. NO. 070097

DATE:

SHEET 0 OF 0

DRAWING NO. 1.2.2.1

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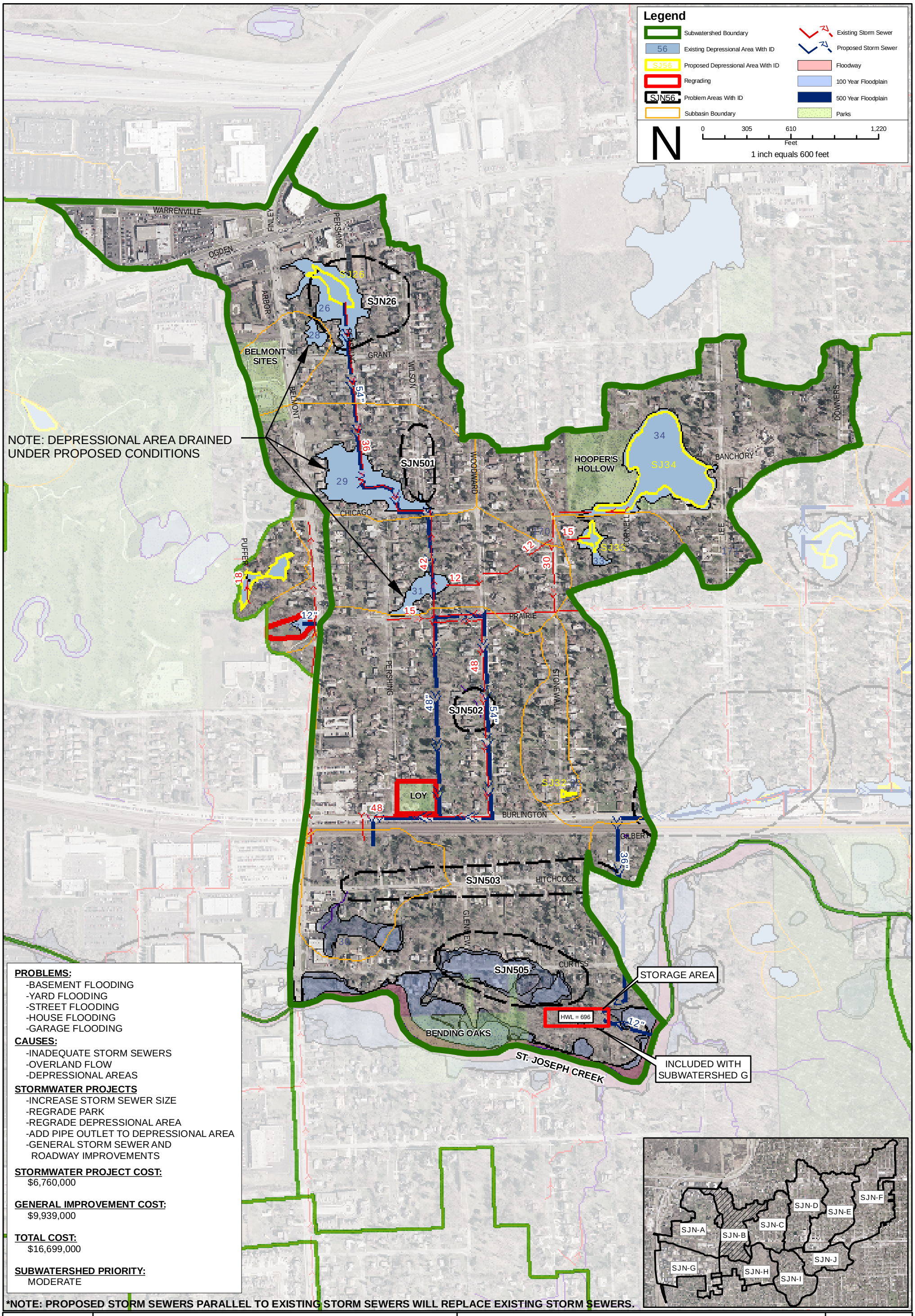

PROBLEMS:
- -BASEMENT FLOODING
- -YARD FLOODING
- -STREET FLOODING
- -HOUSE FLOODING
- -GARAGE FLOODING

CAUSES:
- -INADEQUATE STORM SEWERS
- -OVERLAND FLOW
- -DEPRESSIONAL AREAS

STORMWATER PROJECTS
- -INCREASE STORM SEWER SIZE
- -REGRADE PARK
- -REGRADE DEPRESSIONAL AREA
- -ADD PIPE OUTLET TO DEPRESSIONAL AREA
- -GENERAL STORM SEWER AND ROADWAY IMPROVEMENTS

STORMWATER PROJECT COST:
$6,760,000

GENERAL IMPROVEMENT COST:
$9,939,000

TOTAL COST:
$16,699,000

SUBWATERSHED PRIORITY:
MODERATE

***NOTE: PROPOSED STORM SEWERS PARALLEL TO EXISTING STORM SEWERS WILL REPLACE EXISTING STORM SEWERS.**

Village of DOWNERS GROVE FOUNDED IN 1832

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Rosemont, Illinois 60018
(847) 823-0500

TITLE:

NORTH ST. JOSEPH CREEK WATERSHED
SJN-B SUBWATERSHED

PROJ. NO. 070097
DATE:
SHEET 0 OF 0
DRAWING NO. 1.3.2.1

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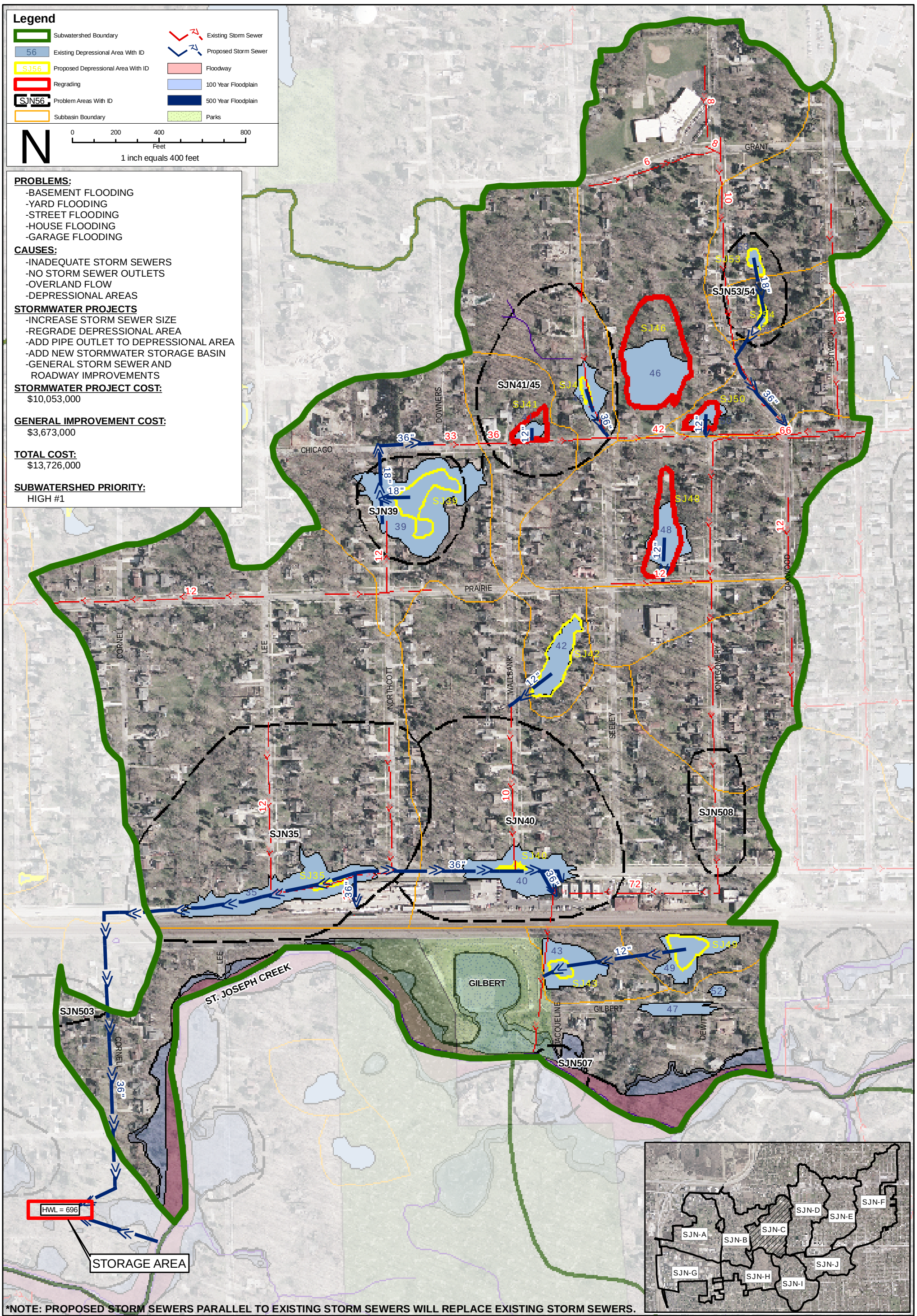

*NOTE: PROPOSED STORM SEWERS PARALLEL TO EXISTING STORM SEWERS WILL REPLACE EXISTING STORM SEWERS.

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TITLE:

NORTH ST. JOSEPH CREEK WATERSHED
SJN-C SUBWATERSHED

PROJ. NO. 070097
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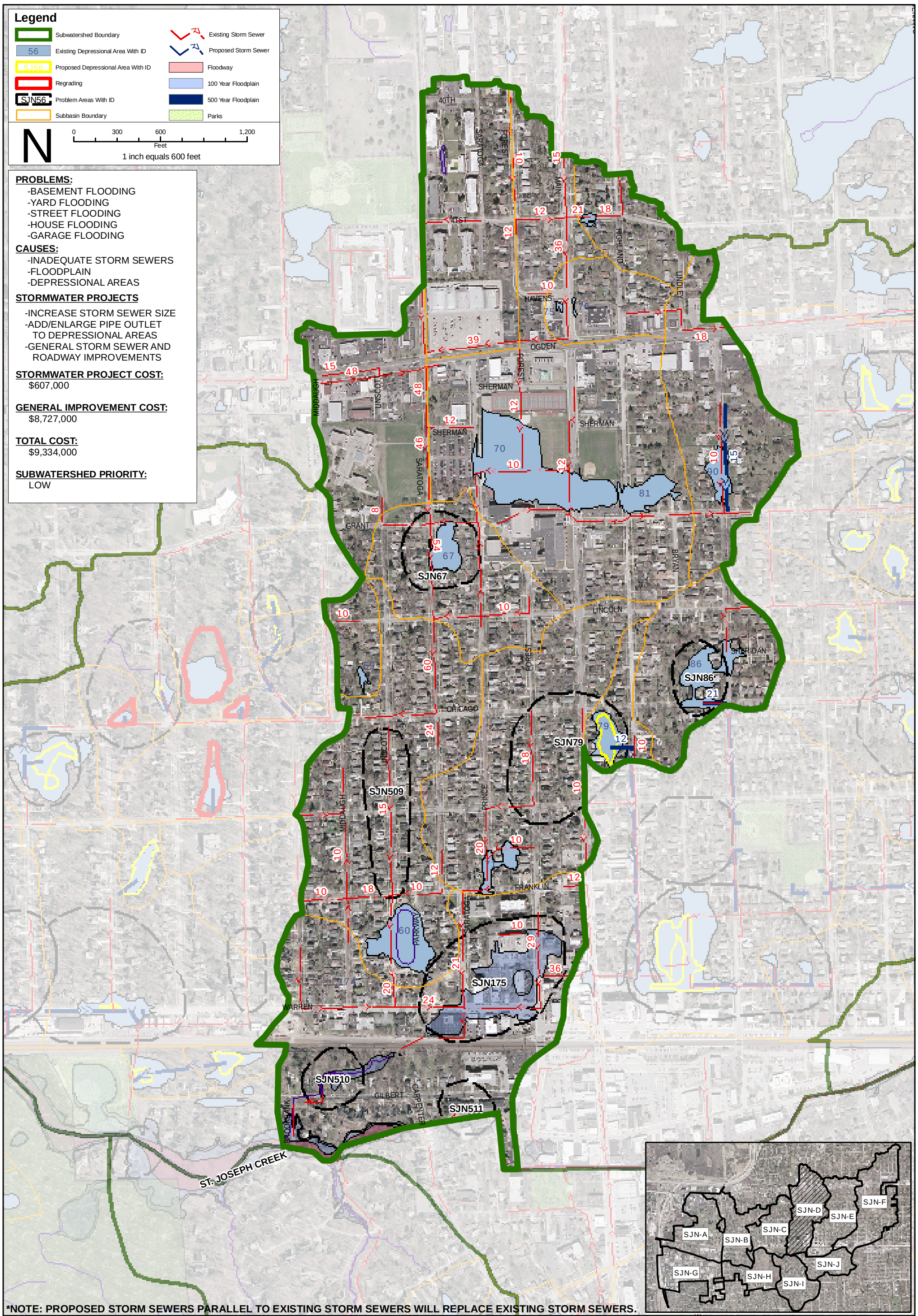

*NOTE: PROPOSED STORM SEWERS PARALLEL TO EXISTING STORM SEWERS WILL REPLACE EXISTING STORM SEWERS.

Village of DOWNERS GROVE FOUNDED IN 1832

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NORTH ST. JOSEPH CREEK WATERSHED
SJN-D SUBWATERSHED

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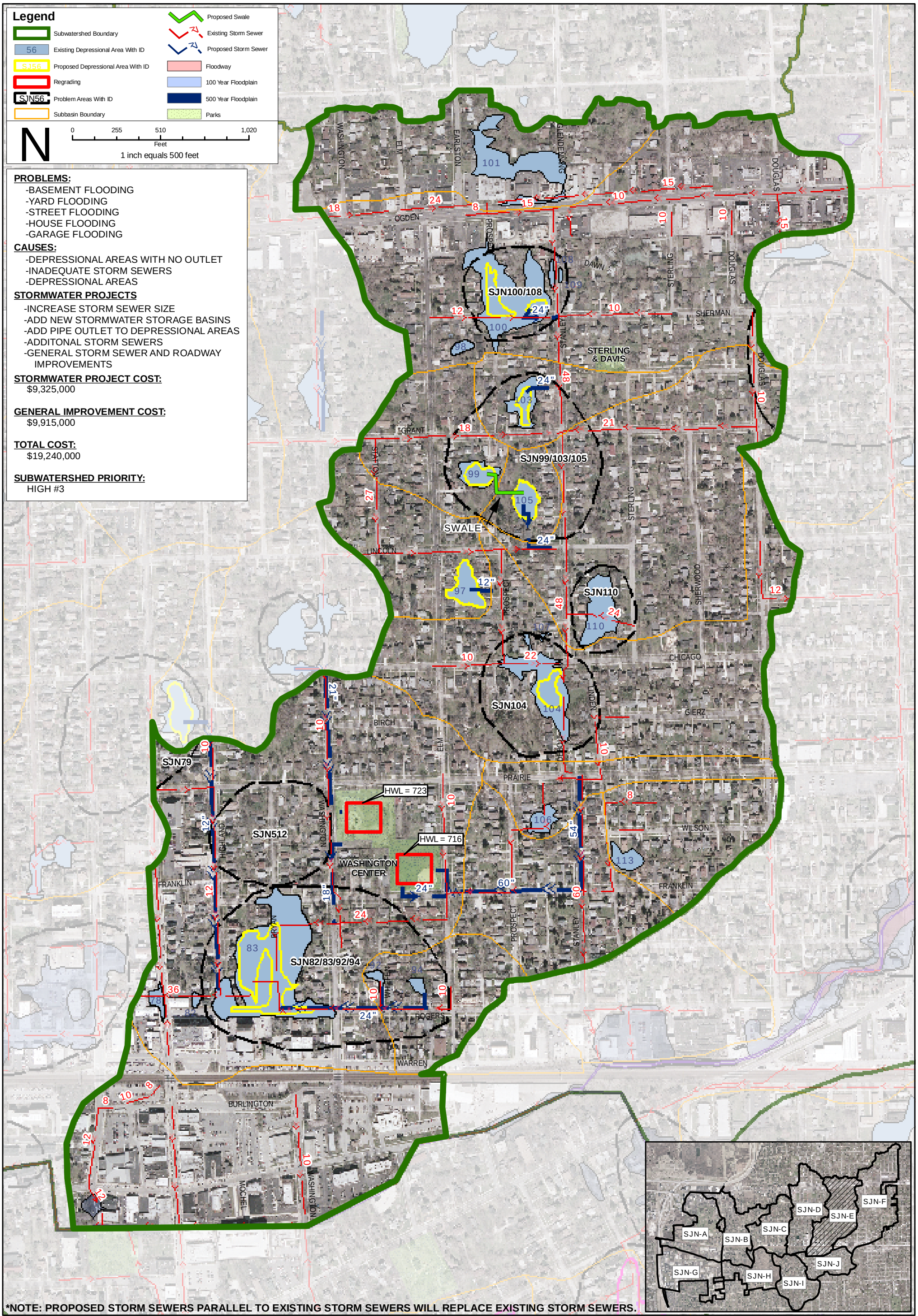

*NOTE: PROPOSED STORM SEWERS PARALLEL TO EXISTING STORM SEWERS WILL REPLACE EXISTING STORM SEWERS.

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TITLE:

NORTH ST. JOSEPH CREEK WATERSHED
SJN-E SUBWATERSHED

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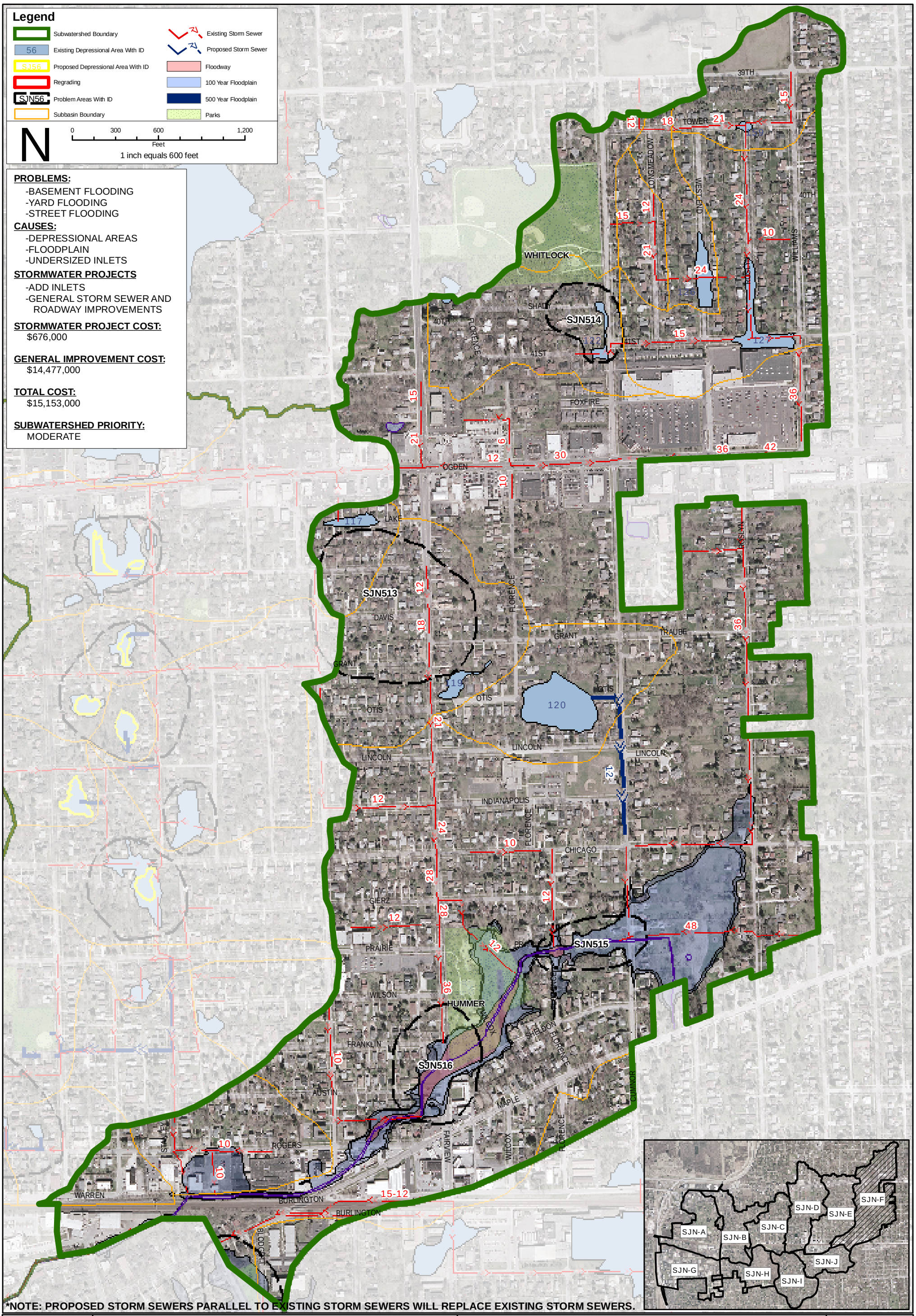

*NOTE: PROPOSED STORM SEWERS PARALLEL TO EXISTING STORM SEWERS WILL REPLACE EXISTING STORM SEWERS.

Village of DOWNERS GROVE FOUNDED IN 1832

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Rosemont, Illinois 60018
(847) 823-0500

TITLE:

NORTH ST. JOSEPH CREEK WATERSHED
SJN-F SUBWATERSHED

PROJ. NO.	070097
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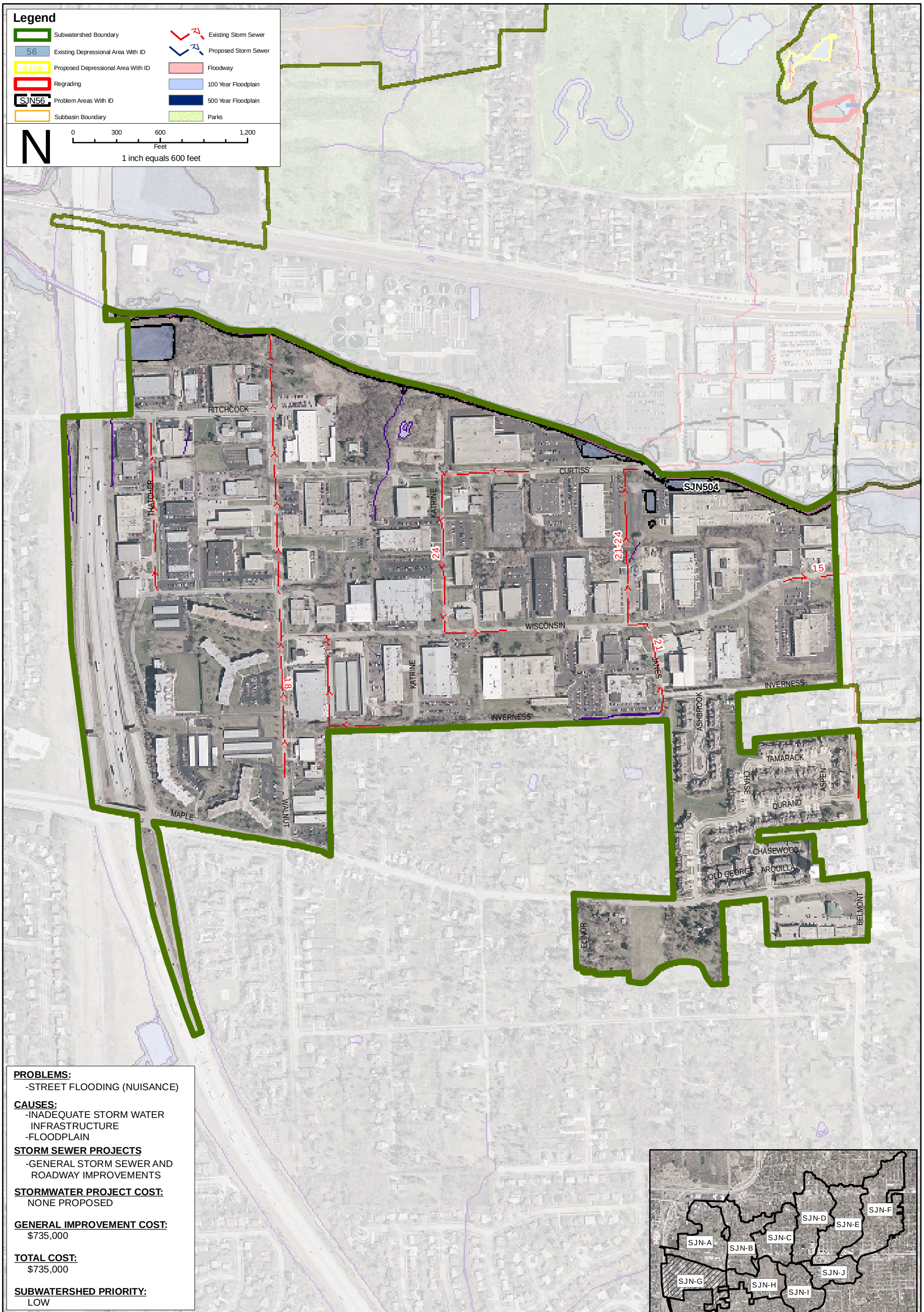

PROBLEMS:
-STREET FLOODING (NUISANCE)

CAUSES:
-INADEQUATE STORM WATER INFRASTRUCTURE
-FLOODPLAIN

STORM SEWER PROJECTS
-GENERAL STORM SEWER AND ROADWAY IMPROVEMENTS

STORMWATER PROJECT COST:
NONE PROPOSED

GENERAL IMPROVEMENT COST:
$735,000

TOTAL COST:
$735,000

SUBWATERSHED PRIORITY:
LOW

***NOTE: PROPOSED STORM SEWERS PARALLEL TO EXISTING STORM SEWERS WILL REPLACE EXISTING STORM SEWERS.**

Village of DOWNERS GROVE FOUNDED IN 1832

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9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

TITLE:

NORTH ST. JOSEPH CREEK WATERSHED
SJN-G SUBWATERSHED

PROJ. NO.	070097
DATE:	
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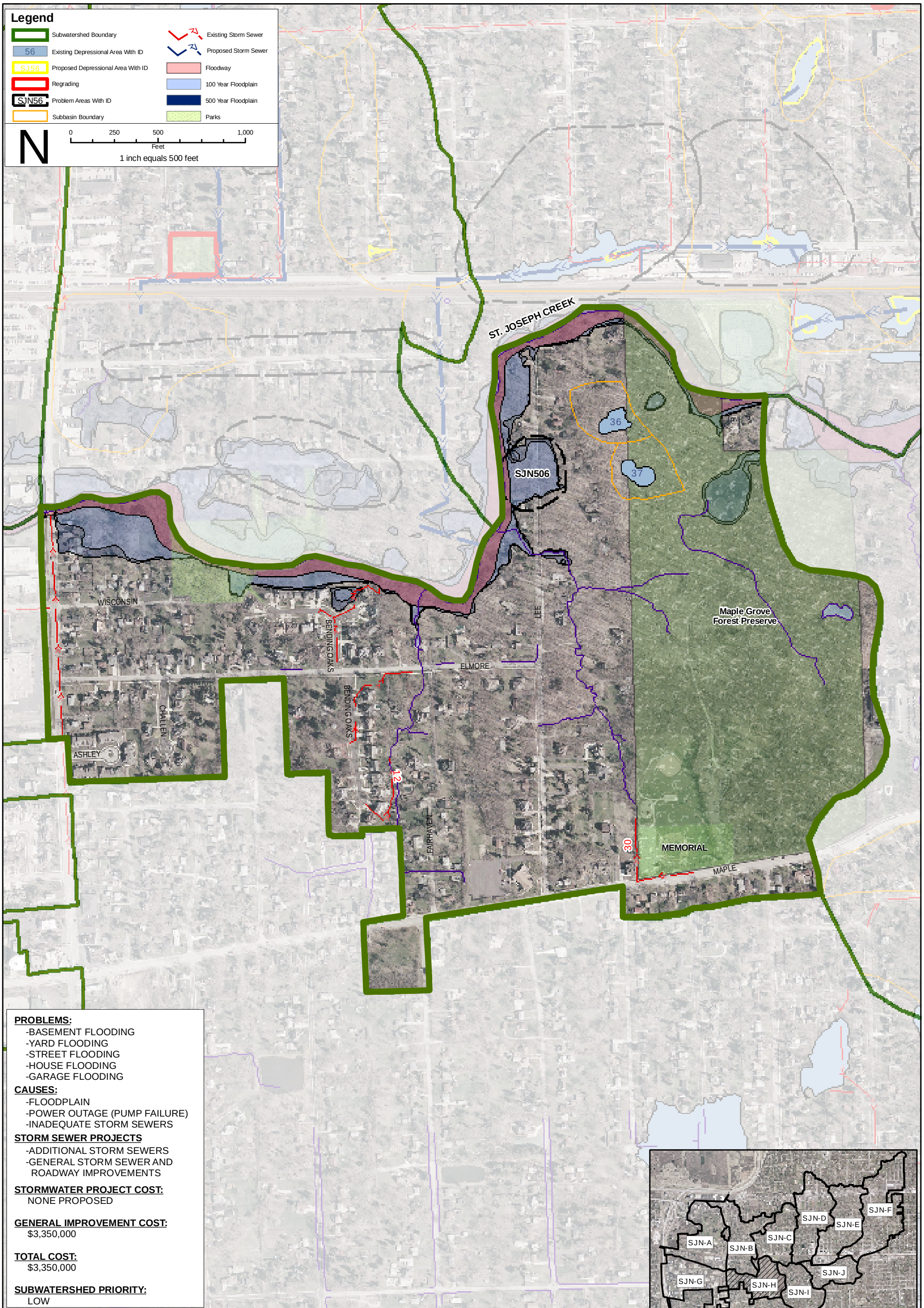

PROBLEMS:
- -BASEMENT FLOODING
- -YARD FLOODING
- -STREET FLOODING
- -HOUSE FLOODING
- -GARAGE FLOODING

CAUSES:
- -FLOODPLAIN
- -POWER OUTAGE (PUMP FAILURE)
- -INADEQUATE STORM SEWERS

STORM SEWER PROJECTS
- -ADDITIONAL STORM SEWERS
- -GENERAL STORM SEWER AND ROADWAY IMPROVEMENTS

STORMWATER PROJECT COST:
NONE PROPOSED

GENERAL IMPROVEMENT COST:
$3,350,000

TOTAL COST:
$3,350,000

SUBWATERSHED PRIORITY:
LOW

***NOTE: PROPOSED STORM SEWERS PARALLEL TO EXISTING STORM SEWERS WILL REPLACE EXISTING STORM SEWERS.**

Village of DOWNERS GROVE FOUNDED IN 1832

CHRISTOPHER B. BURKE ENGINEERING LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

TITLE:

NORTH ST. JOSEPH CREEK WATERSHED
SJN-H SUBWATERSHED

PROJ. NO.	070097
DATE:	
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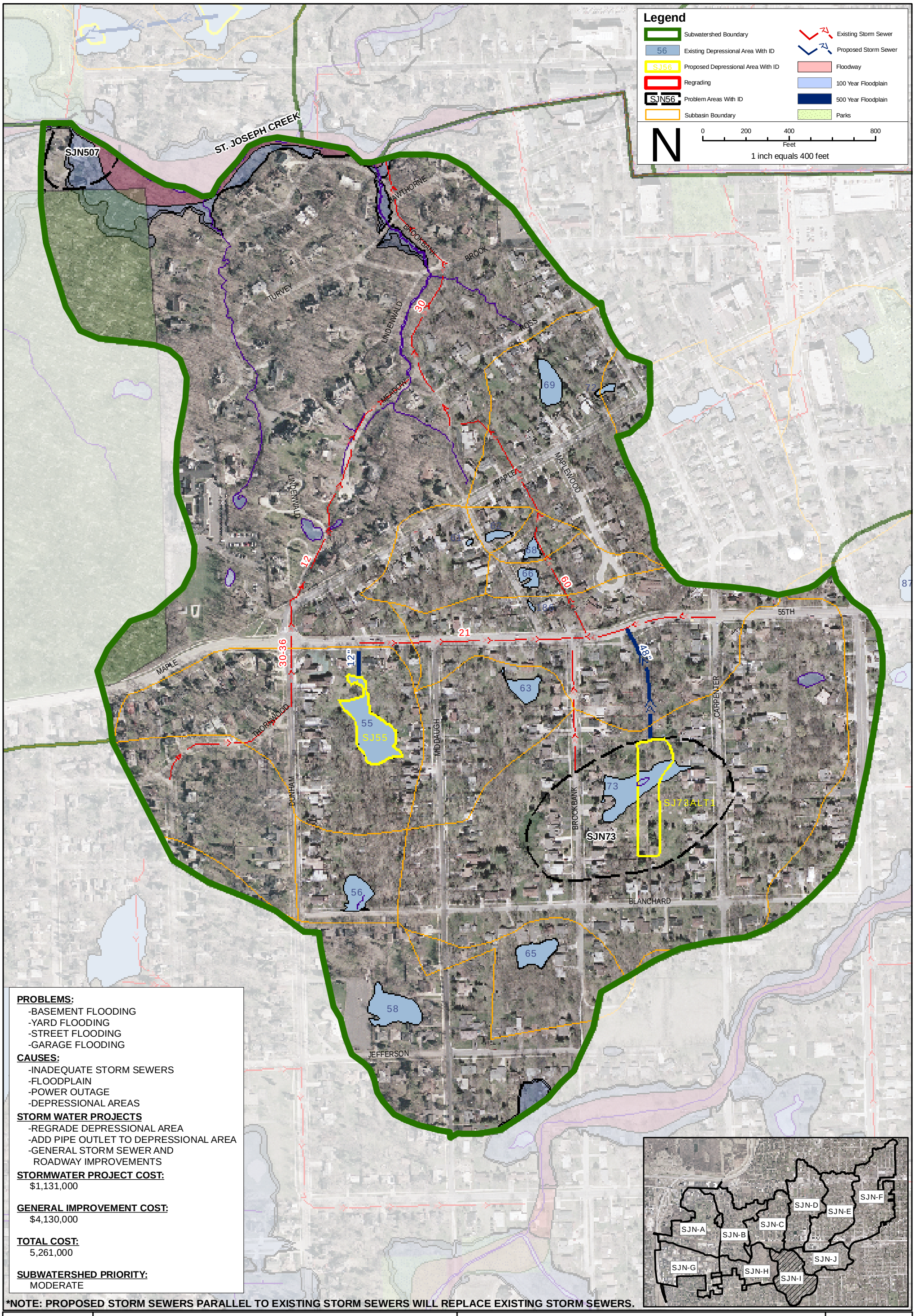

PROBLEMS:
- -BASEMENT FLOODING
- -YARD FLOODING
- -STREET FLOODING
- -GARAGE FLOODING

CAUSES:
- -INADEQUATE STORM SEWERS
- -FLOODPLAIN
- -POWER OUTAGE
- -DEPRESSIONAL AREAS

STORM WATER PROJECTS
- -REGRADE DEPRESSIONAL AREA
- -ADD PIPE OUTLET TO DEPRESSIONAL AREA
- -GENERAL STORM SEWER AND ROADWAY IMPROVEMENTS

STORMWATER PROJECT COST:
$1,131,000

GENERAL IMPROVEMENT COST:
$4,130,000

TOTAL COST:
5,261,000

SUBWATERSHED PRIORITY:
MODERATE

***NOTE: PROPOSED STORM SEWERS PARALLEL TO EXISTING STORM SEWERS WILL REPLACE EXISTING STORM SEWERS.**

Village of DOWNERS GROVE FOUNDED IN 1832

CHRISTOPHER B. BURKE ENGINEERING LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

TITLE:

NORTH ST. JOSEPH CREEK WATERSHED
SJN-I SUBWATERSHED

PROJ. NO. 070097
DATE:
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DRAWING NO. 1.10.2.1

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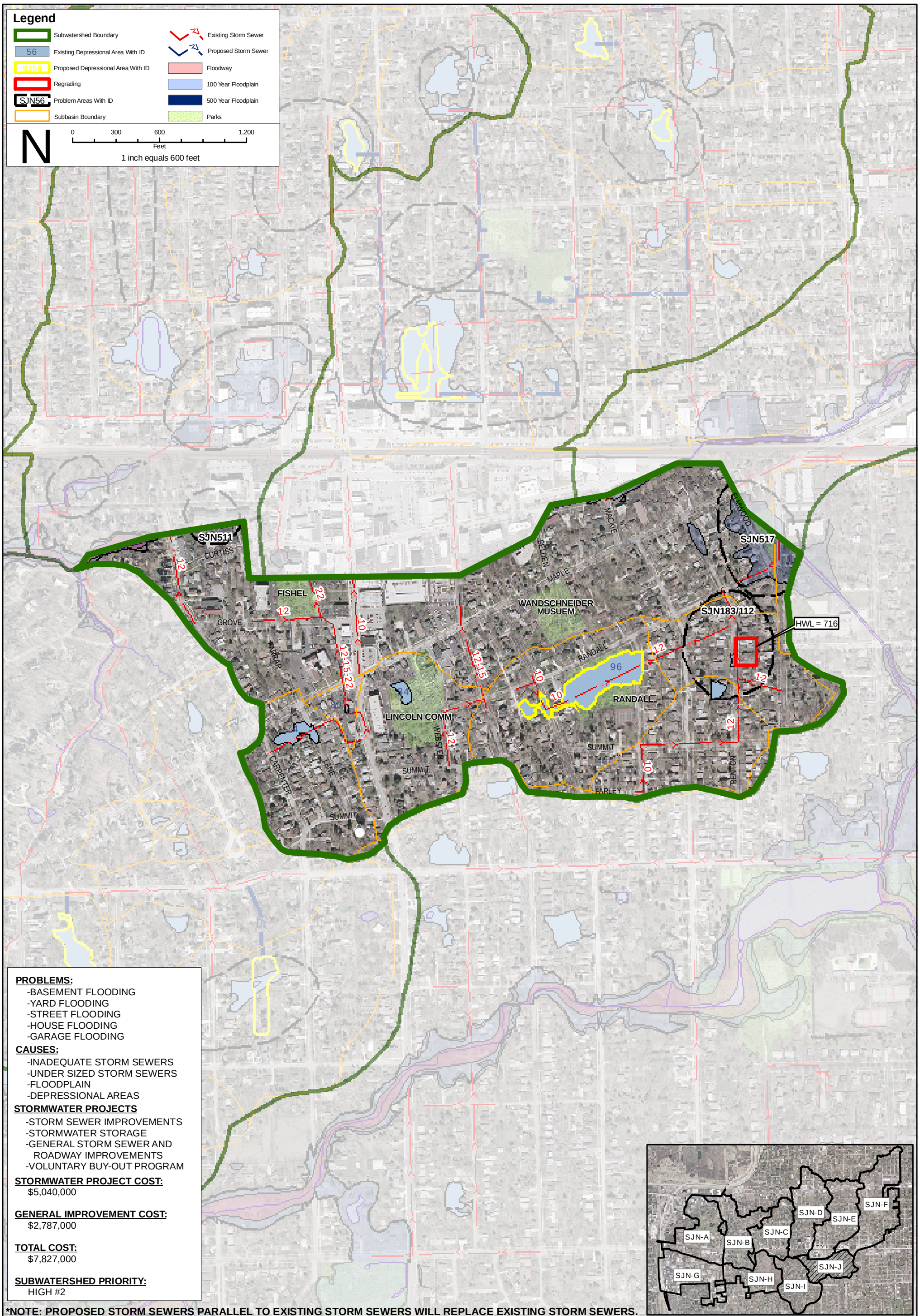

*NOTE: PROPOSED STORM SEWERS PARALLEL TO EXISTING STORM SEWERS WILL REPLACE EXISTING STORM SEWERS.

Village of DOWNERS GROVE FOUNDED IN 1832

CHRISTOPHER B. BURKE ENGINEERING LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

TITLE:

NORTH ST. JOSEPH CREEK WATERSHED
SJN-J SUBWATERSHED

PROJ. NO. 070097

DATE:

SHEET 0 OF 0

DRAWING NO. 1.11.2.1

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5.3.3 Stormwater Project Details

A detailed description of the Improvements Analysis is provided in Appendix A.

5.3.4 Engineer's Estimate of Probable Cost for Stormwater Projects

An engineer's estimate of probable cost was prepared for each subwatershed for the proposed stormwater projects and for general improvements. The estimate of probable cost for stormwater projects was comprised of roadway reconstruction and replacement, storm sewer replacement or addition, regrading, detention storage basins, outlet pipes and control structures, voluntary buy-out program, and the associated Best Management Practices (BMPs), design and construction engineering, and a 20 percent contingency.

5.3.5 Engineer's Estimate of Probable Cost for General Improvements

The Village of Downers Grove also requested adequate stormwater systems through improved infrastructure. The cost for the general upgrade of streets and additional storm sewer, a general improvement cost was prepared. This general improvement cost included storm sewer access within 200 feet of any property for purposes of future connection, reconstruction of rural streets and streets where storm sewer was added, and driveway culvert replacement, and the associated BMPs, design and construction engineering, and a 20 percent contingency.

Table 5.2 Proposed Stormwater Projects and General Improvements Summary

Subwatershed ID	Subwatershed Area (acres)	Subwatershed Priority	Conceptual Estimate of Probable Cost		
			Stormwater Projects	General Improvements	
A	385	Low	*no improvements proposed*	$3,289,000	
B	315	Moderate	$6,760,000	$9,939,000	
C	270	High #1	$10,053,000	$3,673,000	
D	375	Low	$607,000	$8,727,000	
E	375	High #3	$9,325,000	$9,915,000	
F	520	Moderate	$676,000	$14,477,000	
G	345	Low	*no improvements proposed*	$735,000	
H	225	Low	*no improvements proposed*	$3,350,000	
I	245	Moderate	$1,150,000	$4,130,000	
J	175	High #2	$5,040,000	$2,787,000	
TOTALS	3230		$33,611,000	$61,022,000	$94,633,000

Note: St. Joseph Creek maintenance and stabilization cost estimates not included in the above.
For estimation of St. Joseph Creek maintenance and stabilization projects, the following can be utilized:

a. CBBEL 2005 Downtown Area Watershed Plan for St.Joseph Creek Improvements between Carpenter and Lee: $954,000;
b. Village of Downers Grove Capital Improvement Project, maintenance between Carpenter and Belmont: $850,000;
c. Village of Downers Grove Capital Improvement Project, maintenance of St. Joseph Creek culvert from Carpenter to Mackie: $100,000.

6.0 PROPOSED STORMWATER PROJECT PRIORITIZATION

6.1 Prioritization Method

As requested by the Village of Downers Grove, the proposed stormwater projects were to be presented per subwatershed, not per individual stormwater project. The prioritization of problem areas was completed as stated in Section 5.2. The prioritization of problem areas assisted in prioritizing the subwatersheds by quantifying the number of high, moderate, and low priority areas within each subwatershed. The three high priority watersheds contain high priority problem areas. The moderate priority watersheds have moderate priority problem areas and the subwatersheds classified as low priority contain mostly low priority problem areas or did not have identified problem areas. A summary of the proposed stormwater project prioritization is provided as Exhibit 6.1.

Table 6.1 follows.

Table 6.1: Subwatershed Prioritization in North St. Joseph Creek Watershed

Sub-watershed ID	Subwatershed Location	Stormwater Project Summary Per Subwatershed	Subwatershed Prioritization Data					Subwatershed Priority Level
			Permit Reqt's	Estimated Construction Schedule for Stormwater Projects	Estimate of Probable Cost, Stormwater Projects	Estimate of Probable Cost, General Improvements	Estimate of Total Probable Cost	
	General location description		*DG, USACOE, EDP*					*High, Medium, or Low*
SJN-A	West of Belmont north of St. Joseph Creek	*No problem areas identified.*	*N/A*	*N/A*	*N/A*	$3,289,000	$3,289,000	Low
SJN-B	East of Belmont west of Cornell north of St. Joseph Creek	grade stormwater storage basin, increase storm sewer from 48" to 54", add 48" storm sewer, regrade depressional area, provide outlet for depressional area	USACOE, DG	24 months	$6,760,000	$9,939,000	$16,699,000	Moderate
SJN-C	East of Cornell West of Middaugh north of St. Joseph Creek	grade stormwater storage basin, increase storm sewer size, add storm sewer, regrade depressional areas, provide outlet for depressional areas	DG	20 months	$10,053,000	$3,673,000	$13,726,000	High
SJN-D	East of Middaugh, west of Main (south) west of Washington (north). north of St. Joseph Creek	provide outlets or enhance existing outlets of depressional areas	DG	12 months	$607,000	$8,727,000	$9,334,000	Low
SJN-E	East of Main (south) east of Washington (north) west of Douglas north of St. Joseph Creek	grade stormwater storage basins, increase storm sewer, add control/diversion structure, provide outlet for depressional areas	DG	24 months	$9,325,000	$9,915,000	$19,240,000	High
SJN-F	East of Douglas north of North Branch of St. Joseph Creek	add, replace, and maintain inlets	DG	6 months	$676,000	$14,477,000	$15,153,000	Moderate
SJN-G	West of Belmont south of St. Joseph Creek	*No problem areas identified.*	*N/A*	*N/A*	*N/A*	$735,000	$735,000	Low
SJN-H	East of Belmont West of Maple Grove Forest Preserve south of St. Joseph Creek	*No problem areas identified.*	*N/A*	*N/A*	*N/A*	$3,350,000	$3,350,000	Low
SJN-I	East of Maple Grove Forest Preserve west of Carpenter south of St. Joseph Creek	regrade depressional area, provide outlet for depressional areas	USACOE, DG	16 months	$1,150,000	$4,130,000	$5,280,000	Moderate
SJN-J	East of Carpenter south of St. Joseph Creek	voluntary buy-out program, grade stormwater storage basin	DG	20 months	$5,040,000	$2,787,000	$7,827,000	High

Notes:
Projects or improvements associated with the floodplain of St. Joseph Creek are not included in this table.
Permit Requirement Acronyms: U.S. Army Corps of Engineers (USACOE), the Village of Downers Grove (DG), DuPage County Department of Economic Development and Planning (EDP)
Estimated construction schedule based on Project Schdule outline in Tab 2 of Appendix B.

7.0 ADDITIONAL ISSUES

7.1 Easements

Easements will be required for proposed stormwater projects that permanently change private property. Easement issues associated with stormwater projects are noted in Table 5.1.

7.2 Future Roadway Cross Section

Roadways in the Village of Downers Grove are either a rural roadway cross section or a curb and gutter cross-section. The streets with a rural roadway cross section have been slated for improvement to one of three rural cross sections, shown in Appendix B or curb and gutter. The selection of the appropriate rural cross section will be made in the future when streets will be examined at a closer level of detail. Streets currently serviced by curb and gutter will remain a curb and gutter cross section.

7.3 Water Quality Issues

Non-point pollution, including sediment, nutrients, lawn care products, and oil that runoff yards, streets, and impervious surfaces into storm sewers, creeks, depressional areas, and wetlands can be reduced by implementing BMPs. In addition to BMPs improving water quality and biodiversity, flooding may also be reduced. Local, state, and federal regulations support and often require the implementation of BMPs.

BMPs can include wet and dry detention ponds planted with native vegetation, oil and grease separators, vegetated swales, buffers and filter strips, stormwater treatment trains, sedimentation basins, wetlands, conservation easements, and streambank stabilization and maintenance. Besides implementing BMPs in future stomwater projects, existing detention ponds, depressional areas, wetlands, easements, creeks, and drainage swales can be retrofitted to improve water quality and restore water resources.

Residents can be encouraged to contribute by not mowing areas of dedicated easements of native vegetation, incorporating vegetated swales and rain gardens into their yards, disposing of garbage and oil properly, and reporting area of erosion or maintenance needs. These efforts can be reinforced by educational outreach by the Village of Downers Grove.

It should be noted that regular inspection and maintenance of BMPs is an important key to their success and should be considered when evaluating a

BMP for implementation. Because this study was completed on a planning level, specific BMPs were not recommended, but should be evaluated during the design phase. Water quality improvements and BMPs outside of streambank stabilization and maintenance and planned detention areas were not provided as line items in the engineer's estimate of probable cost, but were allotted 10% of the subwatershed stormwater project cost for planning purposes. A separate engineer's estimate of probable cost was prepared for streambank stabilization and maintenance.