

South St. Joseph Creek Watershed

Appendix 3AA: Detailed Problem Areas

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1.0 ST. JOSEPH CREEK SOUTH WATERSHED

1.1 WATERSHED MAP

The Watershed Map found in Section 2.2.3 of Chapter 3A shows the watershed and subwatershed boundaries, depressional areas, and problem areas within the St. Joseph Creek South Watershed.

1.2 SUBWATERSHED SJS-A

This 115-acre subwatershed is located adjacent to the western edge of the Village limits, approximately north of 63rd Street, south of Maple Avenue, east of Springside Avenue, west of Main Street. The northern and western portions of the subwatershed drain to local depressional areas and storage facilities. These low areas are drained by a series of smaller stormsewers to a trunk line sewer beginning at the corner of Dunham Road and 59th Street. The trunk line flows east approximately 1100-feet to its discharge location on the north side of the 59th Street right-of-way. The south-central portion of the subwatershed flows directly into the St. Joseph Creek South Branch creating its headwaters. The southeastern portion of the subwatershed is drained by stormsewers which discharge into the headwaters of St. Joseph Creek. The St. Joseph Creek South Branch headwaters begin just east of the intersection of 61st Street and Dunham Road, in the rear yards of residential homes. The flow of the South Branch is generally northeast at a very flat slope of approximately 0.15%. The South Branch headwaters are conveyed under a residential side yard, driveway, and 59th Street by a 42-inch diameter pipe where it combines with flows from stormsewer discharging the northern and western portion of the subwatershed. The land use in this subwatershed is mostly residential with a small area dedicated to an elementary school located on the southwest corner of Jefferson and Dunham Road.

1.2.1 Problem Area Description

1.2.1.1 SJS44

Problem area SJS44 is located in the northwest corner of Subwatershed SJS-A with George Street to the north, Hillcrest Road to the east, and Plymouth Street to the west. SJS44 has been classified as a moderate priority. It has been determined that problems in this area are caused by a lack of an overland flow path and a restrictive outlet out of depressional area 44. Residents have notified the Village of Downers Grove of basement, yard, and street flooding.

1.2.1.2 SJS400

Problem area SJS400 is located just west of Dunham Road on both the north and south sides of Ridgewood Circle. Flooding problems in this area have been classified as a low priority. During intense storm events the floodplain of St. Joseph Creek South Branch backs up through stormsewers and into the low areas causing rear yard flooding. Minor yard flooding also occurs during smaller events due to the limited capacity of discharging storm sewers. Resident concerns have been recorded as basement and yard flooding.

1.2.1.3 SJS57

Problem area SJS57 is located just east of the 61st Street and Dunham Road intersection. Flooding problems in this area have been classified as a moderate priority. Yard flooding occurs at this location because the depressional area lacks an outfall. This problem area also encompasses the residents north of depressional area 57. Yard flooding occurs at this location during minor storm events due to the extremely flat slopes of the South Branch. During larger more intense storm events the South Branch rises causing minor structural flooding of homes. Residents have reported yard flooding, basement flooding, and structural flooding.

1.2.1.4 SJS64

Problem area SJS64 is located in the southeast portion of Subwatershed SJS-A bounded by 60th Place to the north, Brookbank Road to the east, and Middaugh Avenue to the west. SJS64 has been classified as a moderate priority. It has been determined that problems in this area are caused by a lack of an overland flow path and an undersized stormsewer discharging this depressional area. The sewer continues north under Brookbank Road to its outlet at the South Branch 400-feet north of 60th Place. Residents have notified the Village of Downers Grove of basement and yard flooding.

1.2.1.5 SJS401

Problem area SJS401 is located where the South Branch crosses under 59th Street. SJS401 has been classified as a moderate priority. During heavy rain events the South Branch rises up surcharging stormsewers on 59th Street and on private property. The South Branch is the cause of reported problems such as yard, basement and street flooding.

1.2.1.6 SJS402

Problem area SJS402 is located at the eastern edge of Subwatershed SJS-A on Carpenter Street just south of 60th Street. Flooding problems

in this area have been classified as moderate priority. It has been determined that problems in this area are caused by a lack of an overland flow path and storm sewer capacity. Residents have notified the Village of basement and yard flooding.

1.2.2 Proposed Stormwater Projects

1.2.2.1 SJS-A Subwatershed Exhibit

A “Proposed Conditions Subwatershed A” exhibit showing existing stormsewer and proposed stormwater projects is included in Section 5.3.2 of Chapter 3A.

1.2.2.2 Description

Proposed stormwater projects consist of replacing the outlet stormsewer from SJS44 to the intersection of Hillcrest Road and Jefferson Avenue. It is recommended that an 18- and 30-inch sewer be implemented to achieve a 10-year capacity.

The trunk line from the intersection of Jefferson Avenue and Dunham Road to the 59th Street outlet is proposed to be replaced with the same size sewer. The new system is proposed to eliminate back pitched pipes and eliminate half buried pipes at the outlet. The proposed trunk line will eliminate the maintenance issues with debris and water filled structures and more efficiently convey water to St. Joseph Creek South Branch.

It is recommended that the stormsewer discharging SJS64 to the intersection of Brookbank and 60th Place be changed from a 12 and 18-inch line to an 18 and 24-inch line. It is also recommended that the line from Carpenter Street to 60th Place to the intersection of Brookbank and 60th Place be replaced with an 18 and 24-inch stormsewer. These improvements will give the system a 10-year level of protection.

St. Joseph Creek South Branch floodplain elevation is proposed to be lowered by providing more storage to reduce the discharge out of Subwatershed A. It is recommended that 35-acre-feet of storage be provided and the HWL of the creek be reduced from 748 to 744. This will eliminate floodplain from upstream properties on Ridgewood Circle and reduce the tailwater impacts on the remainder of the system. 35-acre-feet is the maximum anticipated storage available in the subwatershed and best possible scenario.

1.2.2.3 Deviations from Typical Modeling Methods

There were no deviations from typical modeling methods for Subwatershed A.

1.2.2.4 Potential Challenges

The majority of drainage problems in this subwatershed and subwatersheds B & C are caused by the floodplain elevation of the St. Joseph Creek South Branch. The major challenge for all three of these subwatersheds was to lower the floodplain elevation without increasing flow rates downstream. In order to effectively lower floodplain elevations storage facilities were required.

In Subwatershed A the area of the South Branch headwaters was chosen as the best place to provide the most effective storage. This storage facility would be constructed in rear yards of existing residents and would require permanent easements from approximately 36 homeowners.

1.2.2.5 Wetland Potential

Based on the DuPage County Wetland Map, wetlands were identified at problem areas SJS57, SJS401, and the area of the proposed storage facility. Field verification was not completed at the time of this study. It is recommended that field verification be performed for any future projects that may directly or indirectly impact wetlands.

1.2.2.6 Required Permits

The following are permits that may apply to projects in the St. Joseph Creek South Watershed. The permits shown in bold are particular to SJS-A and should be considered when planning projects in the subwatershed.

Approval to construct the proposed stormwater projects would need to be obtained from:

- **Village of Downers Grove**
- **DuPage County Stormwater Permit (delegated review to Downers Grove)**
- **FEMA (CLOMR, LOMR)**
- **IDNR/OWR (Floodway Permit)**
- **U.S. Army Corps of Engineers**
- **IEPA (water quality)**
- **Kane/DuPage Soil and Water Conservation District**

1.2.2.7 Engineer's Estimate of Probable Cost for Stormwater Projects

An engineer's estimate of probable cost was prepared for each Subwatershed for Stormwater Projects. This cost is shown on Proposed Conditions Subwatershed A in Section 5.3.2 as "Project Cost". The "Project Cost" was comprised of replacement of stormsewer, storm structures, outfall replacement, storage facilities, channel maintenance, streambank stabilization, wetland mitigation, easement purchasing, and property purchasing. The "Project Cost" also included pavement patching, roadway resurfacing, or roadway reconstruction for roads that stormsewer is proposed to be replaced. A cost estimate for Subwatershed A can be found in Table A1.2 in the Appendix.

1.2.2.8 Engineer's Estimate of Probable Cost for General Improvements

The Village of Downers Grove requested that the entire Village be serviced by stormsewer no further than 200-feet away. In addition the Village requested that all rural cross-sectional roads be reconstructed. The "General Improvement Cost" shown on Proposed Conditions Subwatershed A in Section 5.3.2 is comprised of reconstruction of rural streets and assuming placing a 12-inch stormsewer at all locations currently not serviced by existing sewer. The General Improvement Cost Estimate for Subwatershed A can be found in Table A1.2.1.

1.2.2.9 Construction Timeline

A basic project schedule was developed to estimate length of time to implement a project from notice-to-proceed with design, through permitting and construction.

Typical design times are assumed as follows, estimated from Notice to Proceed:

- **Small Projects** – 3 months (includes survey, preliminary and final engineering, and construction documents)
- **Large Projects Preliminary Engineering** – 6 months (includes data collection and surveying)
- **Large Projects Final Engineering** – 6 months (includes construction documents and permit submittal documents)

Typical permitting times are assumed as follows:

- **Village of Downers Grove Stormwater Permit** – 12 months (includes a DuPage County Stormwater Permit assuming review delegated to the Village)
- **FEMA (CLOMR)** – 12 months (assuming sign off by community)
- **IDNR/OWR (floodway)** – 9 months (concurrent with Village permit)
- **US Army Corps of Engineers** – 12 months (concurrent with Village permit if not delegated to Downers Grove)
- **IEPA (water quality)** – 9 months (concurrent with Village permit)
- **Kane/DuPage Soil and Water Conservation District** – 3 months (concurrent with Army Corps Permit)

Typical construction time estimates for larger projects are shown below, assuming an early spring start. 2 months are added to each project for bidding and contract award process.

- **Full Road Reconstruction** – 2 blocks per month
- **Streambank Stabilization (Major)** – 1000 linear feet per month
- **Storage Basin Construction** – 2 acre-feet per month

1.3 **SUBWATERSHED SJS-B**

This 60-acre subwatershed is approximately located north of 59th Street, south of Blanchard Street, east of Dunham Road, west of Main Street. The central portion of the subwatershed drains directly to St. Joseph Creek South Branch where it combines with discharge from the existing 36-inch dual stormsewer discharging SJS-A. At this location the South Branch flows north and then east, through residential rear yards, at a very flat slope of approximately 0.20% before discharging into a small wetland just west of Carpenter Street. The northern and western portions of the subwatershed are drained by stormsewer to the South Branch upstream of Carpenter Street. The South Branch discharges under Carpenter Street via where stormwater combines with discharge from the eastern portion of the subwatershed. St. Joseph Creek South Branch continues at north easterly direction under four 36-inch driveway culverts. At this location the South Branch changes from a flat, storage like drainage way to a flowing channel at an approximate 1.0% slope. Subwatershed SJS-B finally

discharges through a 36-inch culvert under Main Street. The land use in this subwatershed is mostly residential with a small area in the northwest dedicated to a church and an open field in the north central.

1.3.1 Problem Area Description

1.3.1.1 SJS58

Problem area SJS58 is located in the northwest corner of Subwatershed SJS-B with Jefferson Avenue to the south, Middaugh Avenue to the east, and Dunham Road to the west. SJS58 has been classified as a low priority. It has been determined that problems in this area are caused by lack of an overland flow path and an outlet affected by the tailwater of the South Branch of St. Joseph Creek. Residents have notified the Village of Downers Grove of yard and basement flooding.

1.3.1.2 SJS403

Problem area SJS403 is located near the southwest corner of the Brookbank Road and Jefferson Avenue in rear yards of homes. Flooding problems in this area have been classified as a moderate priority. Yard flooding occurs at this location during all storm events due to a low area that does not have a positive outfall. During large storm events St. Joseph Creek South Branch jumps its banks causing yard, basement, street, and home flooding.

1.3.1.3 SJS404

Problem area SJS404 is located just east of the intersection of Jefferson Avenue and Carpenter Street. SJS404 has been classified as a low priority. During large storm events flows from St. Joseph Creek South Branch overtop stream banks and driveway culverts causing front yard flooding and inaccessible driveways. Residents have notified the Village of Downers Grove of yard flooding.

1.3.1.4 SJS405

Problem area SJS405 is located at the northwest corner of Main and 59th Street. SJS405 has been classified as a low priority. During large storm events the storm sewer on 59th Street surcharges and spills into this area causing yard flooding as residents have reported.

1.3.2 Proposed Stormwater Projects

1.3.2.1 SJS-B Subwatershed Exhibit

A “Proposed Conditions Subwatershed B” exhibit showing existing stormsewer and proposed stormwater projects is included in Section 5.3.2 of Chapter 3A.

1.3.2.2 Description

Proposed stormwater projects consist of excavating the poorly graded St. Joseph Creek South Branch to provide 22-acre-feet of storage. The storage facility is proposed to be controlled by a 24-inch bypass sewer running from Carpenter north to Blanchard and east to Main Street discharging into the South Branch. The storage facility will lower floodplain elevations and reduce downstream flow rates in the creek. Lowering the floodplain elevation will eliminate the floodplain in SJS58 and reduce the tailwater effect on its outlet sewer. The bypass sewer will reduce front yard flooding and allow access to Carpenter Street homes. 22-acre-feet is the maximum anticipated storage available in the subwatershed and best possible scenario.

It is recommended that maintenance be performed on the channel east of Carpenter Street. A more efficient channel section should be constructed with streambank stabilization. A bioengineering solution is recommended for streambank stabilization projects.

1.3.2.3 Deviations from Typical Modeling Methods

There were no deviations from typical modeling methods for Subwatershed B.

1.3.2.4 Potential Challenges

The majority of drainage problems in this subwatershed and subwatersheds A & C are caused by floodplain elevations in St. Joseph Creek South Branch. The major challenge for all three of these subwatersheds was to lower the floodplain elevation without increasing flow rates downstream. In order to effectively lower floodplain elevations storage facilities were required.

Similar to Subwatershed A an ideal storage location was in the rear yards of homes adjacent to the South Branch. Permanent easements will be needed from approximately 32 homeowners.

1.3.2.5 Wetland Potential

Based on the DuPage County Wetland map, wetlands were identified near problem area SJS403 and at the location of the proposed storage

facility. Field verification was not completed at the time of this study. It is recommended that field verification be performed for any future projects that may directly or indirectly impact wetlands.

1.3.2.6 Required Permits

The following are permits that may apply to projects in the St. Joseph Creek South Watershed. The permits shown in bold are particular to SJS-B and should be considered when planning projects in the subwatershed.

Approval to construct the proposed stormwater projects would need to be obtained from:

- **Village of Downers Grove**
- **DuPage County Stormwater Permit (delegated review to Downers Grove)**
- **FEMA (CLOMR, LOMR)**
- **IDNR/OWR (Floodway Permit)**
- **U.S. Army Corps of Engineers**
- **IEPA (water quality)**
- **Kane/DuPage Soil and Water Conservation District**

1.3.2.7 Engineer's Estimate of Probable Cost for Stormwater Projects

An engineer's estimate of probable cost was prepared for each Subwatershed for Stormwater Projects. This cost is shown on Proposed Conditions Subwatershed B in Section 5.3.2 as "Project Cost". The "Project Cost" was comprised of replacement of stormsewer, storm structures, outfall replacement, storage facilities, channel maintenance, streambank stabilization, wetland mitigation, easement purchasing, and property purchasing. The "Project Cost" also included pavement patching, roadway resurfacing, or roadway reconstruction for roads that stormsewer is proposed to be replaced. A cost estimate for Subwatershed B can be found in Table A1.3 in the Appendix.

1.3.2.8 Engineer's Estimate of Probable Cost for General Improvements

The Village of Downers Grove requested that the entire Village be serviced by stormsewer no further than 200-feet away. In addition the Village requested that all rural cross-sectional roads be reconstructed. The "General Improvement Cost" shown on Proposed Conditions Subwatershed B in Section 5.3.2 is comprised of reconstruction of rural streets and assuming placing a 12-inch stormsewer at all locations currently not serviced by existing sewer. The General

Improvement Cost Estimate for Subwatershed B can be found in Table A1.3.1.

1.3.2.9 Construction Timeline

See Construction Timeline in Section 1.2.2.9

1.4 SUBWATERSHED SJS-C

This 160-acre subwatershed is approximately north of 61st Street, south of 55th Street, east of Main Street, and west of Fairmount Avenue. St. Joseph Creek South Branch serves as the subwatershed outfall. The South Branch flows through the subwatershed in an easterly direction at an approximate 1.0% slope. It enters SJS-C from SJS-B through a 36-inch culvert under Main Street where discharge combines with flow from the southern portion of this subwatershed. The southern portion of the subwatershed drains to local depressional and storage areas. These low areas are drained by stormsewers to a trunk line on Main Street. This 18-inch trunk line conveys flows north 1200-feet to the Creek. The South Branch continues east 400-feet through residential yards where it discharges through two 24-inch culverts under Webster Street and combines with discharge from the central portion of the subwatershed. The central portion of the subwatershed is drained by a combination of open ditches and stormsewers. Stormwater is generally directed in a northwesterly direction with relatively steep slopes of approximately 5%. Stormwater from this portion of the subwatershed discharges into St. Joseph Creek South Branch via an 18-inch stormsewer under Webster Street. The South Branch continues northeast 550-feet through residential yards where it discharges through two 24-inch culverts under Washington Street where discharge combines with flow from the northern portion of the subwatershed. The northern portion of the subwatershed drains to a series of depressional areas located in the rear yards of residents just south of 55th Street. These depressional areas are drained by a series of two stormsewer systems which discharge into the Creek just east of Washington Street. The South Branch continues 400-feet east adjacent to Kenyon Street where it discharges through 36-inch culverts under Lyman Avenue where discharge combines with flow from the eastern portion of the subwatershed. The eastern portion of the subwatershed is drained by an open ditch and culvert system directly to the Creek. The South Branch continues 600-feet east through residential yards where it discharges through 36-inch culverts under Fairmount Avenue where St. Joseph Creek South Branch leaves subwatershed SJS-C and joins up with the St. Joseph Creek main stem at Patriots Park forming Barth Pond. The land use in this subwatershed is mainly residential with a small portion dedicated to an open park at the southwest corner of Main Street and 59th Street.

1.4.1 Problem Area Description

1.4.1.1 SJS88

Problem area SJS88 is located north of 59th Street, east of Main Street on and adjacent to Webster Street. Flooding problems in this area have been classified as a low priority. Flooding occurs at this location due to lack of an overland flow route and the Webster Street stormsewer capacity. Residents have reported yard and garage flooding related to this problem.

1.4.1.2 SJS406

Problem area SJS406 is located on Washington Street midway between 59th Street and Blanchard Street. Flooding problems in this area have been classified as a low priority. Front and rear yard flooding occurs at this location due to the combination of overland flow paths directed at homes, stormsewer capacity in the roadway, and ditch capacity in the rear of homes. Stormwater ponds on street and driveways until it overtops and is conveyed down side yards to a rear yard ditch. Residents have reported yard, street, and driveway flooding related to this problem.

1.4.1.3 SJS407

Problem area SJS407 is located where the South Branch passes under Webster Street. Flooding problems in this area have been classified as a low priority. Flooding at this location is caused by a combination of high flow rates in the ditch and undersized culvert crossings causing the South Branch to flow over Webster Street. Residents reported street and yard flooding.

1.4.1.4 SJS408

Problem area SJS408 is located at the corner of Kenyon Street and Washington Street. SJS408 has been classified as a moderate priority. It has been determined that problems in this area are caused by flow rates exceeding the capacity of St. Joseph Creek South Branch. During heavy storm events water elevations within the creek rise causing yard, garage, basement, and structural flooding damage. Extensive erosion has also occurred within the ditch.

1.4.1.5 SJS85/89

Problem area SJS85/89 is located south of 55th Street between Main and Webster Street. Flooding problems in this area have been classified as low priority. It has been determined that problems in this area are caused by a lack of an overland flow path and storm sewer capacity of the stormsewer that conveys water south through rear yards

of residents and then east to its outlet on Kenyon Street. Residents have notified the Village of yard, and basement flooding.

1.4.1.6 SJS95/187/102

Problem area SJS95/187/102 is located south of 55th Street between Fairmount Avenue and Washington Street. Flooding problems in this area have been classified as moderate priority. Yard, basement, and street flooding occur due to the absence of overland flow paths and capacity of the stormsewer discharging into St. Joseph Creek.

1.4.1.7 SJS409

Problem area SJS409 is located just west of Fairmount Avenue within the floodplain of St. Joseph Creek South Branch. Flooding problems in this area have been classified as a moderate priority. During intense storm events the floodplain of St. Joseph Creek South Branch backs up into yards of residents located on Fairmount Avenue. Resident concerns have been recorded as yard and basement flooding.

1.4.2 Proposed Stormwater Projects

1.4.2.1 SJS-C Subwatershed Exhibit

A “Proposed Conditions Subwatershed C” exhibit showing existing stormsewer and proposed stormwater projects is included in Section 5.3.2 of Chapter 3A.

1.4.2.2 Description

Proposed stormwater projects consist of increasing the capacity of stormsewers north of St. Joseph Creek South Branch to convey the 10-year storm event. These sewers include replacing the 12-inch lines which drain depressional areas 85, 89, 102, 187, and 95 with 18-inch and 24-inch stormsewer. The Washington Street Stormsewer north of the creek is proposed to be increased to an 18-inch sewer.

It is recommended that the Webster Street stormsewer system just south of the South Branch be replaced to provide the 10-year capacity. The improvements included replacing 12 and 18-inch lines on Webster with 18 and 24-inch lines from SJS88 to its outlet on Webster just north of Blanchard Street. Additional improvements include replacing 8 and 12-inch stormsewer on Blanchard and in rear yards of residents on Washington Street, with 12 and 24-inch lines. These improvements are proposed to provide a 10-year capacity.

Additional projects consist of replacing and redirecting stormsewer on 59th Street to a proposed detention facility in the park on the southwest corner of Main and 59th Street. A 24-inch sewer has been proposed to convey the 100-year storm event to the recommended 15-acre-foot storage facility. The storage facility is proposed to serve two purposes. First, it would provide the required detention for converting rural cross-sectional roads in the Subwatershed to curb and gutter urban roads if the Village wishes to do so. Secondly, it would reduce flow rates to the South Branch reducing flood elevations and compensating for increased discharge from the recommended stormsewer improvements.

Four St. Joseph Creek South Branch culverts are proposed to be replaced in order to convey the 100-year flows under Webster Street, Washington Street, Lyman Avenue, and Fairmount Avenue without overtopping the roads. The recommended culverts are three 30-inch pipes under Webster and three 36-inch culverts under the other three crossings.

The final improvements recommended for Subwatershed C is to perform channel maintenance and streambank stabilization for the entire reach of the South Branch within the subwatershed. Channel maintenance may include constructing a more hydraulically sufficient channel cross-section and reducing the number and severity of channel bends.

1.4.2.3 Deviations from Typical Modeling Methods

The storage basin was not designed to detain the 100-year, 24-hour storm event. The basin was designed to achieve as much storage as possible in order to compensate for unknown required detention volumes for road projects and to reduce creek discharge as much as possible.

1.4.2.4 Potential Challenges

Solutions in Subwatershed C include reshaping the South Branch and performing maintenance of the channel. The major challenge would be obtaining temporary easements from homeowners to perform this work. In addition, several stormsewers in rear yards of homes north of the Creek are proposed to be replaced. Access points and construction easements appear to be the most difficult challenge.

1.4.2.5 Wetland Potential

Based on the DuPage County Wetland map, wetlands were identified at problem area SJS95/187/102, SJS85/89, SJS409, and the location of the proposed detention facility. Field verification was not completed at the time of this study. It is recommended that field verification be performed for any future projects that may directly or indirectly impact wetlands.

1.4.2.6 Required Permits

The following are permits that may apply to projects in the St. Joseph Creek South Watershed. The permits shown in bold are particular to SJS-C and should be considered when planning projects in the subwatershed. Wetland permitting through the

Approval to construct the proposed stormwater projects would need to be obtained from:

- **Village of Downers Grove**
- **DuPage County Stormwater Permit (delegated review to Downers Grove)**
- **FEMA (CLOMR, LOMR)**
- **IDNR/OWR (Floodway Permit)**
- **U.S. Army Corps of Engineers**
- **IEPA (water quality)**
- **Kane/DuPage Soil and Water Conservation District**

1.4.2.7 Engineer's Estimate of Probable Cost for Stormwater Projects

An engineer's estimate of probable cost was prepared for each Subwatershed for Stormwater Projects. This cost is shown on Proposed Conditions Subwatershed C in Section 5.3.2 as "Project Cost". The "Project Cost" was comprised of replacement of stormsewer, storm structures, outfall replacement, storage facilities, channel maintenance, streambank stabilization, wetland mitigation, easement purchasing, and property purchasing. The "Project Cost" also included pavement patching, roadway resurfacing, or roadway reconstruction for roads that stormsewer is proposed to be replaced. A cost estimate for Subwatershed C can be found in Table A1.4 in the Appendix.

1.4.2.8 Engineer's Estimate of Probable Cost for General Improvements

The Village of Downers Grove requested that the entire Village be serviced by stormsewer no further than 200-feet away. In addition the Village requested that all rural cross-sectional roads be reconstructed. The "General Improvement Cost" shown on Proposed Conditions

Subwatershed C in Section 5.3.2 is comprised of reconstruction of rural streets and assuming placing a 12-inch stormsewer at all locations currently not serviced by existing sewer. The General Improvement Cost Estimate for Subwatershed C can be found in Table A1.4.1.

1.4.2.9 Construction Timeline

See Construction Timeline in Section 1.2.2.9

1.5 SUBWATERSHED SJS-D

This 45-acre subwatershed is approximately north of 55th Street, south of Summit Street, east of Grand Avenue, and west of Main Street. The majority of the subwatershed discharges to a stormsewer under 55th Street. This line flows east approximately 2300-feet where it discharges into a swale just east of Blodgett Avenue adjacent to 55th Street. The swale extends another 600-feet east where it flows through a 24-inch culvert leaving SJS-D and combining with the discharge from Barth Pond. The northeastern portion of the watershed drains into depressional area SJS-114. This low area is drained by a 12-inch stormsewer to the west and north and out of the St. Joseph Creek South Watershed. The land use in this subwatershed is entirely residential.

1.5.1 Problem Area Description

1.5.1.1 SJS91

Problem area SJS91 is located on Washington Street just south of Summit Street. SJS91 has been classified as a low priority. It has been determined that problems in this area are caused by no overland flow path and stormsewer capacity discharging the low area. Minor yard flooding occurs during large storm events. Resident complaints have been minimal and are recorded as yard and basement flooding for this area.

1.5.1.2 SJS87

Problem area SJS87 is located at the northwest corner of the intersection of Webster and 55th Street. Flooding problems in this area have been classified as a low priority. Minor street and yard flooding occur at this location during extreme storm events.

1.5.1.3 SJS114

Problem area SJS114 is located just east of Blodgett Avenue north of 55th Street. SJS114 has been classified as a low priority. It has been determined that problems in this area are caused by no overland flow path and stormsewer capacity discharging the low area. Residents have notified the Village of Downers Grove of yard flooding.

1.5.2 Proposed Stormwater Projects

1.5.2.1 SJS-D Subwatershed Exhibit

A “Proposed Conditions Subwatershed D” exhibit showing existing stormsewer and proposed stormwater projects is included in Section 5.3.2 of Chapter 3A.

1.5.2.2 Description

Proposed stormwater projects consist of performing channel maintenance for a 600-foot stretch of ditch from Blodgett Avenue to Grand Avenue. Channel maintenance should include removing sediment and debris. Reforming the ditch may be necessary too. The outlet under Grand Avenue should be replaced as it is in poor condition.

1.5.2.3 Deviations from Typical Modeling Methods

There were no deviations from typical modeling methods for Subwatershed D.

1.5.2.4 Potential Challenges

The proposed improvements for Subwatershed D are minimal and straight forward.

1.5.2.5 Wetland Potential

Based on the DuPage County Wetland map, wetlands were identified at the location of proposed channel maintenance. Field verification was not completed at the time of this study. It is recommended that field verification be performed for any future projects that may directly or indirectly impact wetlands.

1.5.2.6 Required Permits

The following are permits that may apply to projects in the St. Joseph Creek South Watershed. The permits shown in bold are particular to

SJS-D and should be considered when planning projects in the subwatershed.

Approval to construct the proposed stormwater projects would need to be obtained from:

- **Village of Downers Grove**
- **DuPage County Stormwater Permit (delegated review to Downers Grove)**
- FEMA (CLOMR, LOMR)
- IDNR/OWR (Floodway Permit)
- **U.S. Army Corps of Engineers**
- **IEPA (water quality)**
- **Kane/DuPage Soil and Water Conservation District**

1.5.2.7 Engineer’s Estimate of Probable Cost for Stormwater Projects

An engineer’s estimate of probable cost was prepared for each Subwatershed for Stormwater Projects. This cost is shown on Proposed Conditions Subwatershed D in Section 5.3.2 as “Project Cost”. The “Project Cost” was comprised of replacement of stormsewer, storm structures, outfall replacement, storage facilities, channel maintenance, streambank stabilization, wetland mitigation, easement purchasing, and property purchasing. The “Project Cost” also included pavement patching, roadway resurfacing, or roadway reconstruction for roads that stormsewer is proposed to be replaced. A cost estimate for Subwatershed D can be found in Table A1.5 in the Appendix.

1.5.2.8 Engineer’s Estimate of Probable Cost for General Improvements

The Village of Downers Grove requested that the entire Village be serviced by stormsewer no further than 200-feet away. In addition the Village requested that all rural cross-sectional roads be reconstructed. The “General Improvement Cost” shown on Proposed Conditions Subwatershed D in Section 5.3.2 is comprised of reconstruction of rural streets and assuming placing a 12-inch stormsewer at all locations currently not serviced by existing sewer. The General Improvement Cost Estimate for Subwatershed D can be found in Table A1.5.1.

1.5.2.9 Construction Timeline

See Construction Timeline in Section 1.2.2.9

1.6 SUBWATERSHED SJS-E

This 70-acre subwatershed is approximately north of 59th Street, south of 55th Street, east of Fairmount Avenue, and west of Fairview Avenue. The northern portion of the subwatershed discharges directly into Barth Pond. The southern portion of the subwatershed drains from south to north at a relatively steep slope of approximately 6%. Stormwater flows to 57th Street and into a stormsewer system that conveys water west and then northwest into Patriots Park. The land use is mainly Patriots Park to the north and residential to the south.

1.6.1 Problem Area Description

1.6.1.1 SJS410

Problem area SJS410 is located on 57th Street just west of Wanda Place. SJS410 has been classified as a low priority. It has been determined that problems in this area are caused by overland flow coming off steep slopes and stormsewer capacity of the 57th Street sewer which discharges northwest to Patriots Park. Residents have notified the Village of Downers Grove of basement flooding.

1.6.2 Proposed Stormwater Projects

1.6.2.1 SJS-E Subwatershed Exhibit

A “Proposed Conditions Subwatershed E” exhibit showing existing stormsewer and proposed stormwater projects is included in Section 5.3.2 of Chapter 3A.

1.6.2.2 Description

Proposed stormwater projects consist of increasing stormsewers under 57th Street, Wanda Place, and Grand Avenue to provide a 10-year capacity. Existing 8, 10, 12, and 15-inch stormsewers are proposed to be replaced with 12 and 18-inch lines.

It is also recommended that a small stretch of St. Joseph Creek be maintained and stabilized. This is an 800-foot stretch beginning just west of Fairview Avenue and terminating just east of Barth Pond. The wetland on the southwest side of Barth Pond should be cleared of debris as well.

1.6.2.3 Deviations from Typical Modeling Methods

There were no deviations from typical modeling methods for Subwatershed E.

1.6.2.4 Potential Challenges

The proposed improvements for Subwatershed E are minimal and straight forward.

1.6.2.5 Wetland Potential

Based on the DuPage County Wetland map, wetlands were identified at the location of proposed channel maintenance. Field verification was not completed at the time of this study. It is recommended that field verification be performed for any future projects that may directly or indirectly impact wetlands.

1.6.2.6 Required Permits

The following are permits that may apply to projects in the St. Joseph Creek South Watershed. The permits shown in bold are particular to SJS-E and should be considered when planning projects in the subwatershed.

Approval to construct the proposed stormwater projects would need to be obtained from:

- **Village of Downers Grove**
- **DuPage County Stormwater Permit (delegated review to Downers Grove)**
- FEMA (CLOMR, LOMR)
- IDNR/OWR (Floodway Permit)
- **U.S. Army Corps of Engineers**
- **IEPA (water quality)**
- **Kane/DuPage Soil and Water Conservation District**

1.6.2.7 Engineer's Estimate of Probable Cost for Stormwater Projects

An engineer's estimate of probable cost was prepared for each Subwatershed for Stormwater Projects. This cost is shown on Proposed Conditions Subwatershed E in Section 5.3.2 as "Project Cost". The "Project Cost" was comprised of replacement of stormsewer, storm structures, outfall replacement, storage facilities, channel maintenance, streambank stabilization, wetland mitigation, easement purchasing, and property purchasing. The "Project Cost" also included pavement patching, roadway resurfacing, or roadway reconstruction for roads that stormsewer is proposed to be replaced. A cost estimate for Subwatershed E can be found in Table A1.6 in the Appendix.

1.6.2.8 Engineer's Estimate of Probable Cost for General Improvements

The Village of Downers Grove requested that the entire Village be serviced by stormsewer no further than 200-feet away. In addition the Village requested that all rural cross-sectional roads be reconstructed. The "General Improvement Cost" shown on Proposed Conditions Subwatershed E in Section 5.3.2 is comprised of reconstruction of rural streets and assuming placing a 12-inch stormsewer at all locations currently not serviced by existing sewer. The General Improvement Cost Estimate for Subwatershed E can be found in Table A1.6.1.

1.6.2.9 Construction Timeline

See Construction Timeline in Section 1.2.2.9

1.7 SUBWATERSHED SJS-F

This 140-acre subwatershed is located adjacent to the eastern edge of the Village limits, approximately north of 63rd Street, south of 56th Street, east of Fairmount Avenue, and west of Fairview Avenue. The entire subwatershed drains by stormsewer to Fairview Avenue where stormsewer size is reduced from a 48-inch to a 24-inch pipe. This restricts the system causing surcharging on Fairview and upstream areas. Overland flow routes direct stormwater to the Deer Creek Detention Pond which does not have enough volume to store this access water.

1.7.1 Problem Area Description

1.7.1.1 SJS115

Problem area SJS115 is located on Bunning Drive just west of Grand Avenue. SJS115 has been classified as a low priority. It has been determined that problems in this area are caused by lack of an overland flow route and capacity of stormsewers discharging the area. Residents have notified the Village of Downers Grove of basement and street flooding.

1.7.1.2 SJS116

Problem area SJS116 is located on the southwest corner of 59th Street and Grand Avenue. This area has been classified as a low priority. SJS116 is a small depression area that does not contain an outlet causing shallow ponding in the area. Residents have reported yard flooding.

1.7.1.3 SJS411

Problem area SJS411 is located near the intersection of Grand Avenue and 60th Street. SJS411 has been classified as a moderate priority. It has been determined that problems in this area are caused by the downstream capacity of the stormsewer system. Residents have notified the Village of Downers Grove of basement, garage, and street flooding.

1.7.1.4 SJS412

Problem area SJS412 is located on Osage Avenue between 60th Street and 61th Street. SJS412 has been classified as a low priority. It has been determined that problems in this area are caused by the downstream capacity of the stormsewer system. Residents have notified the Village of Downers Grove of yard and street flooding.

1.7.2 Proposed Stormwater Projects

1.7.2.1 SJS-F Subwatershed Exhibit

A “Proposed Conditions Subwatershed F” exhibit showing existing stormsewer and proposed stormwater projects is included in Section 5.3.2 of Chapter 3A.

1.7.2.2 Description

Proposed stormwater projects consist of increasing the size of stormsewers from Bunning Drive to 59th Street to Fairview Avenue to provide a 10-year capacity.

A 30-inch bypass sewer is proposed beginning just north of the 59th Street and Fairview Avenue intersection and running 1700-feet north to St. Joseph Creek under Fairview Avenue. The bypass sewer will give the Fairview Avenue system a 10-year level of capacity. The sewer will help relieve pressure on the Deer Creek Detention facility reducing flooding in Subwatershed H as well.

1.7.2.3 Deviations from Typical Modeling Methods

There were no deviations from typical modeling methods for Subwatershed F.

1.7.2.4 Potential Challenges

Construction of the bypass sewer will most likely increase flow rates to St. Joseph Creek. Detailed stormwater modeling and permitting appears to be the biggest challenge in Subwatershed F. If a detention facility is required finding open space to implement the facility may be difficult.

1.7.2.5 Wetland Potential

Based on the DuPage County Wetland map, no wetlands were identified in the Subwatershed. Field verification was not completed at the time of this study. It is recommended that field verification be performed for any future projects that may directly or indirectly impact wetlands.

1.7.2.6 Required Permits

The following are permits that may apply to projects in the St. Joseph Creek South Watershed. The permits shown in bold are particular to SJS-F and should be considered when planning projects in the subwatershed.

Approval to construct the proposed stormwater projects would need to be obtained from:

- **Village of Downers Grove**
- DuPage County Stormwater Permit (delegated review to Downers Grove)
- FEMA (CLOMR, LOMR)
- IDNR/OWR (Floodway Permit)
- U.S. Army Corps of Engineers
- IEPA (water quality)
- Kane/DuPage Soil and Water Conservation District

1.7.2.7 Engineer's Estimate of Probable Cost for Stormwater Projects

An engineer's estimate of probable cost was prepared for each Subwatershed for Stormwater Projects. This cost is shown on Proposed Conditions Subwatershed F in Section 5.3.2 as "Project Cost". The "Project Cost" was comprised of replacement of stormsewer, storm structures, outfall replacement, storage facilities, channel maintenance, streambank stabilization, wetland mitigation, easement purchasing, and property purchasing. The "Project Cost" also included pavement patching, roadway resurfacing, or roadway reconstruction for roads that stormsewer is proposed to be replaced. A cost estimate for Subwatershed F can be found in Table A1.7 in the Appendix.

1.7.2.8 Engineer's Estimate of Probable Cost for General Improvements

The Village of Downers Grove requested that the entire Village be serviced by stormsewer no further than 200-feet away. In addition the Village requested that all rural cross-sectional roads be reconstructed. The "General Improvement Cost" shown on Proposed Conditions Subwatershed F in Section 5.3.2 is comprised of reconstruction of rural streets and assuming placing a 12-inch stormsewer at all locations currently not serviced by existing sewer. The General Improvement Cost Estimate for Subwatershed F can be found in Table A1.7.1.

1.7.2.9 Construction Timeline

See Construction Timeline in Section 1.2.2.9

1.8 SUBWATERSHED SJS-G

This 90-acre subwatershed is approximately north of 55th Street, south of 3rd Street, east of Blodgett Avenue, and west of Cumnor Road. The eastern portion of subwatershed drains to local depressional and low areas. A series of stormsewers drain these depressional areas to St. Joseph Creek which is located just east of Fairview Avenue. St. Joseph Creek makes up the western portion of this subwatershed which conveys stormwater 1500-feet north from 55th Street to a large diameter culvert at Hill Street. This culvert extends to the northwest 500-feet before the Creek daylights again just east of Blodgett Avenue. The open channel continues in a northeasterly direction before again entering a large diameter culvert which conveys the Creek out of the St. Joseph Creek South Watershed. The land use in this subwatershed is residential to the north and east and floodplain riparian area to the west.

1.8.1 Problem Area Description

1.8.1.1 SJS184

Problem area SJS184 is located just east of Fairview Avenue between 6th and 7th Streets. SJS184 has been classified as a moderate priority. It has been determined that problems in this area are caused by a combination of a lack of an overland flow path and stormsewer capacity of its outlet. Residents have reported street, yard, and basement flooding related to this problem.

1.8.1.2 SJS413

Problem area SJS413 is located on 3rd Street just east of Fairview Avenue. Flooding problems in this area have been classified as a low priority. It has been determined that problems in this area are caused by a combination of a lack of an overland flow path and the stormsewer capacity which drains the low area. Residents have reported street and basement flooding.

1.8.1.3 SJS414

Problem area SJS414 is located on 8th Street just west of Florence Avenue. Flooding problems in this area have been classified as a low priority. It has been determined that problems in this area are caused by a combination of a lack of an overland flow path and the stormsewer capacity which drains the low area. Residents have reported basement flooding.

1.8.2 Proposed Stormwater Projects

1.8.2.1 SJS-G Subwatershed Exhibit

A “Proposed Conditions Subwatershed G” exhibit showing existing stormsewer and proposed stormwater projects is included in Section 5.3.2 of Chapter 3A.

1.8.2.2 Description

Proposed stormwater projects consist of replacing majority of the Fairview Avenue stormsewer system. It is recommended that the 15-inch sewer be replaced with a 24, 27, and 30-inch sewer on Fairview Avenue from 5th to 7th Street. The 12-inch stormsewer on 5th Street should be replaced with an 18-inch sewer and the 12-inch storm on 8th Street should be replaced with an 18-inch sewer. These improvements will provide the stormsewer system in Subwatershed G a 10-year capacity.

Maintenance should be performed on St. Joseph Creek from 55th Street to Blodgett Avenue. This 2000-foot stretch of channel should be cleared of debris and sedimentation removed.

1.8.2.3 Deviations from Typical Modeling Methods

There were no deviations from typical modeling methods for Subwatershed G.

1.8.2.4 Potential Challenges

Increasing the size of stormsewers in Subwatershed G may increase flow rates in St. Joseph Creek. A detention facility may be required to compensate for this increase. A major challenge is to find an ideal location for such a facility. A few options may be to enlarge the storage capacity in Barth Pond or create an on-line storage basin in St. Joseph Creek just east of Fairview Avenue between 55th Street and Hill Street.

1.8.2.5 Wetland Potential

Based on the DuPage County Wetland map, wetlands were identified at the location of proposed channel maintenance. Field verification was not completed at the time of this study. It is recommended that field verification be performed for any future projects that may directly or indirectly impact wetlands.

1.8.2.6 Required Permits

The following are permits that may apply to projects in the St. Joseph Creek South Watershed. The permits shown in bold are particular to SJS-G and should be considered when planning projects in the subwatershed.

Approval to construct the proposed stormwater projects would need to be obtained from:

- **Village of Downers Grove**
- **DuPage County Stormwater Permit (delegated review to Downers Grove)**
- FEMA (CLOMR, LOMR)
- IDNR/OWR (Floodway Permit)
- **U.S. Army Corps of Engineers**
- **IEPA (water quality)**
- **Kane/DuPage Soil and Water Conservation District**

1.8.2.7 Engineer's Estimate of Probable Cost for Stormwater Projects

An engineer's estimate of probable cost was prepared for each Subwatershed for Stormwater Projects. This cost is shown on Proposed Conditions Subwatershed G in Section 5.3.2 as "Project Cost". The "Project Cost" was comprised of replacement of stormsewer, storm structures, outfall replacement, storage facilities, channel maintenance, streambank stabilization, wetland mitigation, easement purchasing, and property purchasing. The "Project Cost" also included pavement patching, roadway resurfacing, or roadway reconstruction for roads that stormsewer is proposed to be replaced. A

cost estimate for Subwatershed G can be found in Table A1.8 in the Appendix.

1.8.2.8 Engineer's Estimate of Probable Cost for General Improvements

The Village of Downers Grove requested that the entire Village be serviced by stormsewer no further than 200-feet away. In addition the Village requested that all rural cross-sectional roads be reconstructed. The "General Improvement Cost" shown on Proposed Conditions Subwatershed G in Section 5.3.2 is comprised of reconstruction of rural streets and assuming placing a 12-inch stormsewer at all locations currently not serviced by existing sewer. The General Improvement Cost Estimate for Subwatershed G can be found in Table A1.8.1.

1.8.2.9 Construction Timeline

See Construction Timeline in Section 1.2.2.9

1.9 SUBWATERSHED SJS-H

This 70-acre subwatershed is located adjacent to the eastern edge of the Village limits, approximately north of 57th Street, south of 55th Street, east of Fairview Avenue, and west of the King Arthur Court apartment complex. St. Joseph Creek flows east to west through the center of the watershed. The entire subwatershed drains to St. Joseph Creek via overland flow routes or minor storm sewers. Majority of flow through this subwatershed comes from offsite tributary areas. Subwatershed SJS-H receives flows from three major upstream drainage areas. The entire upstream watershed of St. Joseph Creek enters SJS-H from the east via the King Arthur Court apartment complex. Runoff from subwatershed SJS-I enters from the north through a 36-inch CMP culvert. Overflow from subwatershed SJS-F enters from the south through and over the Deerfield Creek detention facility. Flows from all three upstream areas and the subwatershed itself combine and flow under Fairview Avenue where St. Joseph Creek combines with the South Branch at Barth Pond. The land use in this subwatershed is mainly residential with the exception of a small pond located just east of Fairview.

1.9.1 Problem Area Description

1.9.1.1 SJS415

Problem area SJS415 is located at the intersection of Wilcox Avenue and 56th Street. Flooding problems in this area have been classified as a low priority. During large storm events stormwater backs up through stormsewers and ponds in streets and rear yards of Wilcox Avenue

residents. Flooding is due to the St. Joseph Creek floodplain elevations. Residents have reported yard and street flooding.

1.9.1.2 SJS416

Problem area SJS416 is located south of 56th Street at the end of Deer Path Lane. SJS416 has been classified as a moderate priority. It has been determined that problems in this area are caused by overflow from the Deer Creek Detention facility. Residents have reported yard and basement flooding related to this problem.

1.9.1.3 SJS417

Problem area SJS417 is located east of Deer Path Lane on 56th Street. Flooding problems in this area have been classified as a moderate priority. During large storm events stormwater flow in the 56th Street channel jumps its banks and encroaches upon residential properties along 56th Street. Water elevations are due to the floodplain elevations of St. Joseph Creek at this location. Residents have reported yard, basement, and structural flooding in this area.

1.9.1.4 SJS418

Problem area SJS418 is located at the southeast corner of Subwatershed H at the end of Harmarc Court. SJS418 has been classified as a moderate priority. It has been determined that problems in this area are caused by the floodplain elevation of St. Joseph Creek. During large storm events stormwater floods the King Arthur Court apartments causing water to encroach upon residential lots on Harmarc Court. Residents have reported reoccurring yard flooding and basement flooding related to this problem.

1.9.2 Proposed Stormwater Projects

1.9.2.1 SJS-H Subwatershed Exhibit

A “Proposed Conditions Subwatershed H” exhibit showing existing stormsewer and proposed stormwater projects is included in Section 5.3.2 of Chapter 3A.

1.9.2.2 Description

Proposed stormwater projects consist of performing maintenance and streambank stabilization on the channel in rear yards of residents on the west side of Deer Path Lane. This channel should be shaped in order to convey the 100-year overflow from the Deer Creek Detention

Facility located to the south. Stabilization should be designed to protect this maximum overflow velocity. In addition, St. Joseph Creek, in the middle of 56th Street, should be stabilized from Cumnor Road to Fairview Avenue.

1.9.2.3 Deviations from Typical Modeling Methods

There were no deviations from typical modeling methods for Subwatershed H.

1.9.2.4 Potential Challenges

Any significant improvements to this subwatershed will require a reduction in flow rate in St. Joseph Creek and to the Deer Creek Detention Pond. The construction of the proposed bypass sewer in Subwatershed F will reduce the frequency the Deer Creek Detention Pond overtops but will not eliminate flooding problems at SJS416. In order to significantly help stormwater problems in Subwatershed H a regional storage facility will need to be constructed or modified to reduce flow rates in St. Joseph Creek. This facility will need to be constructed in the upper reaches outside of the Village limits. The biggest challenge would be getting outside entities to cooperate in constructing this necessary storage facility.

1.9.2.5 Wetland Potential

Based on the DuPage County Wetland map, no wetlands were identified in the Subwatershed. Field verification was not completed at the time of this study. It is recommended that field verification be performed for any future projects that may directly or indirectly impact wetlands.

1.9.2.6 Required Permits

The following are permits that may apply to projects in the St. Joseph Creek South Watershed. The permits shown in bold are particular to SJS-H and should be considered when planning projects in the subwatershed.

Approval to construct the proposed stormwater projects would need to be obtained from:

- **Village of Downers Grove**
- DuPage County Stormwater Permit (delegated review to Downers Grove)
- FEMA (CLOMR, LOMR)

- IDNR/OWR (Floodway Permit)
- U.S. Army Corps of Engineers
- IEPA (water quality)
- Kane/DuPage Soil and Water Conservation District

1.9.2.7 Engineer's Estimate of Probable Cost for Stormwater Projects

An engineer's estimate of probable cost was prepared for each Subwatershed for Stormwater Projects. This cost is shown on Proposed Conditions Subwatershed H in Section 5.3.2 as "Project Cost". The "Project Cost" was comprised of replacement of stormsewer, storm structures, outfall replacement, storage facilities, channel maintenance, streambank stabilization, wetland mitigation, easement purchasing, and property purchasing. The "Project Cost" also included pavement patching, roadway resurfacing, or roadway reconstruction for roads that stormsewer is proposed to be replaced. A cost estimate for Subwatershed H can be found in Table A1.9 in the Appendix.

1.9.2.8 Engineer's Estimate of Probable Cost for General Improvements

The Village of Downers Grove requested that the entire Village be serviced by stormsewer no further than 200-feet away. In addition the Village requested that all rural cross-sectional roads be reconstructed. The "General Improvement Cost" shown on Proposed Conditions Subwatershed H in Section 5.3.2 is comprised of reconstruction of rural streets and assuming placing a 12-inch stormsewer at all locations currently not serviced by existing sewer. The General Improvement Cost Estimate for Subwatershed H can be found in Table A1.9.1.

1.9.2.9 Construction Timeline

See Construction Timeline in Section 1.2.2.9

1.10 SUBWATERSHED SJS-I

This 50-acre subwatershed is located adjacent to the eastern edge of the Village limits, approximately north of 55th Street, south of 5th Street, east of Florence Avenue, and west of Williams Street. The southeastern portion of this subwatershed is drained by open ditches and culverts at moderate slopes of approximately 3%. Water is conveyed to a depressional area just east of Cumnor and south of 6th Street. This depressional area lies within the floodplain of St. Joseph Creek and is drained by an 18-inch stormsewer. Discharge from this area combines with discharge from the north and western portion of the subwatershed which are drained by a 24-inch storm sewer within the Cumnor Road right-of-way. The entire SJS-I subwatershed is

conveyed to the 56th Street system within Subwatershed SJS-H via a 36-inch CMP pipe. The land use in this subwatershed consists entirely of residential areas.

1.10.1 Problem Area Description

1.10.1.1 SJS419

Problem area SJS419 is located at the intersection of Cumnor Road and 6th Street. SJS419 has been classified as a low priority. It has been determined that problems in this area are caused by a combination of overland flow directed to a low spot on 8th Street and the stormsewer capacity which drains it. Residents have reported street flooding related to this problem.

1.10.1.2 SJS420

Problem area SJS420 is located at the intersection of 8th and Williams Street. Flooding problems in this area have been classified as a low priority. Problems are caused by overland flow being directed to this intersection. Because the roads are rural without curb and gutter, stormwater flows uncontrolled allowing it to spread out into yards and at homes. Residents have reported yard flooding in this area.

1.10.1.3 SJS124

Problem area SJS124 is located at the northwest corner of 8th Street and Cumnor Road. SJS124 has been classified as a moderate priority. It has been determined that problems in this area are caused by a combination of overland flow directed to a low spot on 8th Street and the stormsewer capacity which drains it. Residents have reported reoccurring yard and street flooding related to this problem.

1.10.1.4 SJS125

Problem area SJS125 is surrounded by 8th Street to the north, 55th Street to the south, Victor Street to the east and Cumnor Road to the west. Flooding problems in this area have been classified as a high priority. During large storm events stormwater flows into the area through stormsewer and overland flow routes from the north and east and from surcharging stormsewers on 55th Street. SJS125 floods several feet due to lack of stormsewer capacity and backwater from St. Joseph Creek. Residents have reported yard, garage, street, basement, and structural flooding. Modeling shows no relief can be provided during the extreme events such as the October 2, 2006 storm.

1.10.2 Proposed Stormwater Projects

1.10.2.1 SJS-I Subwatershed Exhibit

A “Proposed Conditions Subwatershed I” exhibit showing existing stormsewer and proposed stormwater projects is included in Section 5.3.2 of Chapter 3A.

1.10.2.2 Description

Proposed stormwater projects consist of buying out 8 properties between 8th and 55th Street and between Cumnor and Victor Street. In replace of the homes a 6-acre-foot storage basin is proposed. The floodplain of St. Joseph Creek encroaches upon this area making any other solution extremely difficult and cost intensive.

1.10.2.3 Deviations from Typical Modeling Methods

There were no deviations from typical modeling methods for Subwatershed I.

1.10.2.4 Potential Challenges

The proposed solution for Subwatershed I is to buy out eight properties. The biggest challenge is obtaining the properties necessary to eliminate future flood costs.

1.10.2.5 Wetland Potential

Based on the DuPage County Wetland map, no wetlands were identified in the Subwatershed. Field verification was not completed at the time of this study. It is recommended that field verification be performed for any future projects that may directly or indirectly impact wetlands.

1.10.2.6 Required Permits

The following are permits that may apply to projects in the St. Joseph Creek South Watershed. The permits shown in bold are particular to SJS-I and should be considered when planning projects in the subwatershed.

Approval to construct the proposed stormwater projects would need to be obtained from:

- **Village of Downers Grove**

- **DuPage County Stormwater Permit (delegated review to Downers Grove)**
- FEMA (CLOMR, LOMR)
- IDNR/OWR (Floodway Permit)
- U.S. Army Corps of Engineers
- IEPA (water quality)
- Kane/DuPage Soil and Water Conservation District

1.10.2.7 Engineer's Estimate of Probable Cost for Stormwater Projects

An engineer's estimate of probable cost was prepared for each Subwatershed for Stormwater Projects. This cost is shown on Proposed Conditions Subwatershed I in Section 5.3.2 as "Project Cost". The "Project Cost" was comprised of replacement of stormsewer, storm structures, outfall replacement, storage facilities, channel maintenance, streambank stabilization, wetland mitigation, easement purchasing, and property purchasing. The "Project Cost" also included pavement patching, roadway resurfacing, or roadway reconstruction for roads that stormsewer is proposed to be replaced. A cost estimate for Subwatershed I can be found in Table A1.10 in the Appendix.

1.10.2.8 Engineer's Estimate of Probable Cost for General Improvements

The Village of Downers Grove requested that the entire Village be serviced by stormsewer no further than 200-feet away. In addition the Village requested that all rural cross-sectional roads be reconstructed. The "General Improvement Cost" shown on Proposed Conditions Subwatershed I in Section 5.3.2 is comprised of reconstruction of rural streets and assuming placing a 12-inch stormsewer at all locations currently not serviced by existing sewer. The General Improvement Cost Estimate for Subwatershed I can be found in Table A1.10.1.

1.10.2.9 Construction Timeline

See Construction Timeline in Section 1.2.2.9

1.11 SUBWATERSHED SJS-J

This 200-acre subwatershed is located adjacent to the eastern edge of the Village limits, approximately north of 7th Street, south of Maple Avenue, east of Grand Avenue, and west of Williams Street. A large portion of this subwatershed falls outside the Village limits. The Burlington Northern railroad tracks divide this subwatershed into a northern and southern portion. Stormwater from the entire southern portion drains to one of three depressional areas. All three depressional areas are drained by a stormsewer within the 2nd Street right-of-way which conveys

water west to St. Joseph Creek. Stormwater from the northern portion of the subwatershed conjugates in a depressional area at the corner of Cumnor and Burlington. The only outlet of this area is through a 24-inch stormsewer which conveys water south under the railroad tracks connecting to the 2nd Street stormsewer system. The land use in this subwatershed consists of mostly residential with some commercial and industrial usage north of 2nd Street and south of Burlington Street.

1.11.1 Problem Area Description

1.11.1.1 SJS128

Problem area SJS128 is located west of Williams Street between 4th and 6th Streets. SJS128 has been classified as a moderate priority. It has been determined that problems in this area are caused by lack of overland flow path and the capacity of the stormsewer system that drains the entire subwatershed. Residents have reported yard and basement flooding related to this problem.

1.11.1.2 SJS121/123

Problem area SJS121/123 is located at the intersection of 2nd Street and Cumnor Road. Flooding problems in this area have been classified as a high priority. This area is a large depressional area with the only outlet a 27-inch stormsewer. Flooding is caused by the lack of capacity in this sewer combined with the absence of an overland flow path. This bowl shaped area would have to flood approximately 6-feet before it would overtop. Residents have reported yard, garage, street, basement, and structural flooding.

1.11.1.3 SJS118

Problem area SJS118 is located on Fairview Avenue just south of the Burlington Northern railroad tracks and north of 2nd Street. Flooding problems in this area have been classified as a moderate priority. It has been determined that problems in this area are caused by a lack of an overland flow path and capacity of the stormsewer that relieves the entire subwatershed. Resident concerns have been recorded as reoccurring street flooding.

1.11.2 Proposed Stormwater Projects

1.11.2.1 SJS-J Subwatershed Exhibit

A “Proposed Conditions Subwatershed J” exhibit showing existing stormsewer and proposed stormwater projects is included in Section 5.3.2 of Chapter 3A.

1.11.2.2 Description

Proposed stormwater projects consist of replacing the entire subwatershed stormsewer system. The existing system has a 27-inch outlet that provides an approximate 6-month level of protection. The proposed improvements call for a 78-inch outlet giving the network a 100-year conveyance capacity. The existing 24-inch sewer under the railroad tracks is proposed to be replaced with a 60-inch sewer, the 21-inch sewer running north on Williams Street and west on 2nd Street is proposed to be replaced with a 42-inch sewer, and the 21-inch sewer on Cumnor from 4th to 2nd Street is proposed to be replaced with a 42-inch line.

1.11.2.3 Deviations from Typical Modeling Methods

There were no deviations from typical modeling methods for Subwatershed J.

1.11.2.4 Potential Challenges

The proposed improvements will increase flow rates by 300 cfs. These improvements will most likely require storage to compensate for the increase in flows unless a detailed analysis demonstrates otherwise. Potential storage locations are in Patriots Park or just east of Fairview Avenue between 55th Street and Hill Avenue.

1.11.2.5 Wetland Potential

Based on the DuPage County Wetland map, wetlands were identified at SJS121/123 north of the Burlington Northern railroad tracks. Field verification was not completed at the time of this study. It is recommended that field verification be performed for any future projects that may directly or indirectly impact wetlands.

1.11.2.6 Required Permits

The following are permits that may apply to projects in the St. Joseph Creek South Watershed. The permits shown in bold are particular to SJS-J and should be considered when planning projects in the subwatershed.

Approval to construct the proposed stormwater projects would need to be obtained from:

- **Village of Downers Grove**

- **DuPage County Stormwater Permit (delegated review to Downers Grove)**
- FEMA (CLOMR, LOMR)
- IDNR/OWR (Floodway Permit)
- **U.S. Army Corps of Engineers**
- **IEPA (water quality)**
- **Kane/DuPage Soil and Water Conservation District**

1.11.2.7 Engineer’s Estimate of Probable Cost for Stormwater Projects

An engineer’s estimate of probable cost was prepared for each Subwatershed for Stormwater Projects. This cost is shown on Proposed Conditions Subwatershed J in Section 5.3.2 as “Project Cost”. The “Project Cost” was comprised of replacement of stormsewer, storm structures, outfall replacement, storage facilities, channel maintenance, streambank stabilization, wetland mitigation, easement purchasing, and property purchasing. The “Project Cost” also included pavement patching, roadway resurfacing, or roadway reconstruction for roads that stormsewer is proposed to be replaced. A cost estimate for Subwatershed J can be found in Table A1.11 in the Appendix.

1.11.2.8 Engineer’s Estimate of Probable Cost for General Improvements

The Village of Downers Grove requested that the entire Village be serviced by stormsewer no further than 200-feet away. In addition the Village requested that all rural cross-sectional roads be reconstructed. The “General Improvement Cost” shown on Proposed Conditions Subwatershed J in Section 5.3.2 is comprised of reconstruction of rural streets and assuming placing a 12-inch stormsewer at all locations currently not serviced by existing sewer. The General Improvement Cost Estimate for Subwatershed J can be found in Table A1.11.1.

1.11.2.9 Construction Timeline

See Construction Timeline in Section 1.2.2.9

A.1 COMPLETE LIST OF ALL REPORTED PROBLEM AREAS IN ST. JOSEPH CREEK SOUTH WATERSHED

Problem Area ID	Location	Complaint Data Source	Problem Description				
			House	Basement	Garage	Yard	Street
	5145 CUMNOR RD.	Residents			x	x	x
	5412 CUMNOR RD.	Residents				x	x
	5324 CUMNOR RD.	Residents	x	x		x	x
	5804 WASHINGTON ST.	Residents				x	
	125 8TH ST.	Residents	x	x		x	x
	5917 LYMAN AVE.	Village Master List, 11/29/2006					x
	5928 LYMAN AVE.	Village Master List				x	
	6000 OSAGE AVE.	Village Master List, 10/2/2006					x
	6026 OSAGE AVE.	Village Master List, 10/2/2006					x
	6213 OSAGE AVE.	Village Master List				x	
	5804 WASHINGTON ST.	Village Master List, 10/2/2006				x	
	5600 WEBSTER ST.	Village Master List				x	
	5543 WILCOX AVE.	Village Master List, 10/2/2006					x
	5306 WILLIAMS ST.	Village Master List, 10/2/2006				x	
	5708 HILLCREST RD.	Village Master List, 10/2/2006				x	
	1209 JEFFERSON AVE.	Village Master List, 10/2/2006					x
	1227 JEFFERSON AVE.	Village Master List				x	
	1520 JEFFERSON AVE.	Village Master List				x	
	949 KENYON ST.	Village Master List		x		x	
	5412 LYMAN AVE.	Village Master List, constant				x	
	5504 LYMAN AVE.	Village Master List, 10/2/2006					x
	5637 LYMAN AVE.	Village Master List				x	
	5701 LYMAN AVE.	Village Master List, 11/29/2006				x	
	5825 LYMAN AVE.	Village Master List, 11/29/2006				x	
	5827 LYMAN AVE.	Village Master List, 11/29/2006				x	
	5316 FAIRVIEW AVE.	Village Master List, 10/2/2006					x
	5322 FAIRVIEW AVE.	Village Master List, 10/2/2006					x
	5344 FAIRVIEW AVE.	Village Master List				x	
	5501 FAIRVIEW AVE.	Village Master List					x
	5308 FLORENCE AVE.	Village Master List, 10/2/2006	x				
	5143 GRAND AVE.	Village Master List, 10/2/2006	x				
	5419 GRAND AVE.	Village Master List, 11/29/2006				x	
	6009 GRAND AVE.	Village Master List, 10/2/2006					x
	5630 HILLCREST RD.	Village Master List, 10/2/2006					x
	5708 HILLCREST RD.	Village Master List, 10/2/2006					x
	549 57TH ST.	Village Master List, 10/2/2006	x				
	235 5TH ST.	Village Master List, 10/2/2006				x	

A.1 COMPLETE LIST OF ALL REPORTED PROBLEM AREAS IN ST. JOSEPH CREEK SOUTH WATERSHED

Problem Area ID	Location	Complaint Data Source	Problem Description				
			House	Basement	Garage	Yard	Street
	222 6TH ST.	Village Master List				x	
	338 6TH ST.	Village Master List, 10/2/2006				x	
	121 8TH ST.	Village Master List, 11/29/2006				x	
	5129 CUMNOR RD.	Village Master List, 10/2/2006	x				
	5132 CUMNOR RD.	Village Master List, 11/29/2006	x				
	5200 CUMNOR RD.	Village Master List					x
	5204 CUMNOR RD.	Village Master List					x
	5231 CUMNOR RD.	Village Master List	x				
	5324 CUMNOR RD.	Village Master List, 10/2/2006	x				
	4TH CUMNOR RD.	Village Master List, 10/2/2006					x
	5800 DEARBORN PKWY	Village Master List, 10/2/2006					x
	6035 DUNHAM RD.	Village Master List, 10/2/2006	x				
	5128 FAIRVIEW AVE.	Village Master List, 10/2/2006					x
	231 2ND ST.	Village Master List, 10/2/2006	x				
	231 2ND ST.	Village Master List, 10/2/2006	x				

A.1 COMPLETE LIST OF ALL REPORTED PROBLEM AREAS IN ST. JOSEPH CREEK SOUTH WATERSHED

Problem Area ID	Location	Complaint Data Source	Problem Description				
			House	Basement	Garage	Yard	Street
	417 2ND ST.	Village Master List, constant				x	
	339 3RD ST.	Village Master List, 10/2/2006					x
	235 5TH ST.	Village Master List, persitent problem				x	
	VICTOR ST. 55TH ST.	Village Master List, since fall 2006				x	
	324 56TH ST.	Village Master List, constant				x	
	340 56TH ST.	Village Master List, 10/2/2006				x	
	340 56TH ST.	Village Master List, recurring with				x	
	5808 SPRINGSIDE	GIS			x		
	6133 DUNHAM RD	GIS			x		
	5738 WEBSTER	GIS			x		
	5753 WEBSTER ST	GIS			x		
	5817 WEBSTER ST	GIS			x		
	845 KENYON AVE	GIS			x		
	728 59TH ST	GIS			x		
	5925 GRAND AVE	GIS			x		
	5712 GRAND AVE	GIS			x		
	5340 PARK AVE	GIS			x		
	5411 BLODGETT AVE	GIS			x		
	234 56TH ST	GIS			x		
	413 HILL ST	GIS			x		
	314 FIFTH ST	GIS			x		
	5305 FLORENCE AVE	GIS			x		
	5330 CUMNOR RD	GIS			x		
	325 SECOND ST.	GIS			x		
	5132 CUMNOR RD	GIS			x		
	101 SECOND ST.	GIS			x		
	5840 SPRINGSIDE	GIS		x			
	5808 SPRINGSIDE	GIS		x			
	5804 AUBREY TERR	GIS		x			
	5724 SPRINGSIDE AVE	GIS		x			
	5713 AUBREY TER	GIS		x			
	5736 PLYMOUTH ST	GIS		x			
	5644 PLYMOUTH ST	GIS		x			
	1529 GEORGE ST	GIS		x			
	1517 GEORGE ST	GIS		x			
	5704 HILLCREST RD	GIS		x			
	1520 JEFFERSON AVE	GIS		x			
	5632 DUNHAM RD	GIS		x			
	5733 HILLCREST RD	GIS		x			
	5732 DUNHAM RD	GIS		x			
	5738 DUNHAM RD	GIS		x			
	5709 DUNHAM RD	GIS		x			
	1339 BLANCHARD ST	GIS		x			
	1332 BLANCHARD ST	GIS		x			
	5732 MIDDAUGH AVE	GIS		x			
	1523 JEFFERSON AVE	GIS		x			
	6033 RIDGEWOOD CIR	GIS		x			
	6000 HILLCREST CT	GIS		x			
	6009 HILLCREST CT	GIS		x			
	1409 RIDGEWOOD CIR	GIS		x			
	6224 MIDDAUGH AVE	GIS		x			
	6205 MIDDAUGH AVE	GIS		x			
	1232 62ND ST	GIS		x			
	1230 WALLEN PL	GIS		x			
	1210 WALLEN PL	GIS		x			
	6040 BROOKBANK RD	GIS		x			
	6024 BROOKBANK RD	GIS		x			
	1219 60TH PL	GIS		x			
	1225 60TH PL	GIS		x			
	1231 60TH PL	GIS		x			
	6133 DUNHAM RD	GIS		x			
	6101 DUNHAM RD	GIS		x			
	6037 DUNHAM RD	GIS		x			
	6017 DUNHAM RD	GIS		x			

A.1 COMPLETE LIST OF ALL REPORTED PROBLEM AREAS IN ST. JOSEPH CREEK SOUTH WATERSHED

Problem Area ID	Location	Complaint Data Source	Problem Description				
			House	Basement	Garage	Yard	Street
	1236 60TH PL	GIS		x			
	5913 DUNHAM RD	GIS		x			
	1231 59TH ST	GIS		x			
	5912 BROOKBANK RD	GIS		x			
	1308 59TH ST	GIS		x			
	5808 MIDDAUGH AVE	GIS		x			
	5807 MIDDAUGH AVE	GIS		x			
	1221 JEFFERSON AVE	GIS		x			
	1209 JEFFERSON AVE	GIS		x			
	5826 BROOKBANK RD	GIS		x			
	1232 JEFFERSON AVE	GIS		x			
	1137 JEFFERSON AVE	GIS		x			
	1121 JEFFERSON AVE	GIS		x			
	1117 JEFFERSON AVE	GIS		x			
	5814 CARPENTER ST	GIS		x			
	1108 59TH ST	GIS		x			
	6003 CARPENTER ST	GIS		x			
	1101 60TH ST	GIS		x			
	1122 60TH PL	GIS		x			
	6009 CARPENTER ST	GIS		x			
	1106 60TH PL	GIS		x			
	6024 CARPENTER ST	GIS		x			
	6032 CARPENTER ST	GIS		x			
	6025 CARPENTER ST	GIS		x			
	1124 61ST ST	GIS		x			
	1112 61ST ST	GIS		x			
	1040 61ST ST	GIS		x			
	5728 MAIN ST	GIS		x			
	5816 MAIN ST	GIS		x			
	941 SUMMIT ST	GIS		x			
	5405 WEBSTER ST Q	GIS		x			
	5344 LYMAN AVE	GIS		x			
	5500 WEBSTER ST	GIS		x			
	5532 WEBSTER ST	GIS		x			
	5544 WEBSTER ST	GIS		x			
	5557 MAIN ST	GIS		x			
	5500 WASHINGTON ST	GIS		x			
	5508 WASHINGTON ST	GIS		x			
	5517 WEBSTER ST	GIS		x			
	5520 WASHINGTON ST	GIS		x			
	5546 WASHINGTON ST	GIS		x			
	5501 WASHINGTON ST	GIS		x			
	5509 WASHINGTON ST	GIS		x			
	5513 WASHINGTON ST	GIS		x			
	5517 WASHINGTON ST	GIS		x			
	5520 LYMAN AVE	GIS		x			
	5553 WASHINGTON ST	GIS		x			
	5606 LYMAN AVE	GIS		x			
	5626 LYMAN AVE	GIS		x			
	5742 LYMAN AVE	GIS		x			
	5830 LYMAN AVE	GIS		x			
	5925 WASHINGTON ST	GIS		x			
	731 59TH ST	GIS		x			
	5933 LYMAN	GIS		x			
	845 KENYON AVE	GIS		x			
	835 KENYON ST	GIS		x			
	5712 WEBSTER ST	GIS		x			
	5718 WEBSTER ST	GIS		x			
	5708 WASHINGTON ST	GIS		x			
	5736 WASHINGTON ST	GIS		x			
	5825 MAIN ST	GIS		x			
	5916 WASHINGTON ST	GIS		x			
	5921 WEBSTER PL	GIS		x			
	748 FARLEY PL	GIS		x			
	5420 PARK AVE	GIS		x			
	5428 PARK AVE	GIS		x			
	5525 LYMAN AVE	GIS		x			
	5524 FAIRMOUNT AVE	GIS		x			
	5530 FAIRMOUNT AVE	GIS		x			
	5600 FAIRMOUNT AVE	GIS		x			

A.1 COMPLETE LIST OF ALL REPORTED PROBLEM AREAS IN ST. JOSEPH CREEK SOUTH WATERSHED

Problem Area ID	Location	Complaint Data Source	Problem Description				
			House	Basement	Garage	Yard	Street
	5717 LYMAN AVE	GIS		x			
	5725 LYMAN AVE	GIS		x			
	728 59TH ST	GIS		x			
	718 59TH ST	GIS		x			
	5401 BENTON AVE	GIS		x			
	5404 BENTON AVE	GIS		x			
	5408 BENTON AVE	GIS		x			
	5417 BENTON	GIS		x			
	5412 BLODGETT AVE	GIS		x			
	5424 BENTON AVE	GIS		x			
	5421 FAIRMOUNT AVE	GIS		x			
	5435 FAIRMOUNT AVE	GIS		x			
	5129 GRAND AVE	GIS		x			
	5204 GRAND AVE	GIS		x			
	555 HILL ST	GIS		x			
	5313 GRAND AVE	GIS		x			
	5308 FAIRVIEW AVE	GIS		x			
	5336 GRAND AVE	GIS		x			
	5410 GRAND AVE	GIS		x			
	5440 FAIRVIEW AVE	GIS		x			
	542 57TH ST	GIS		x			
	424 57TH ST	GIS		x			
	5709 FAIRMOUNT AVE	GIS		x			
	5729 FAIRMOUNT AVE	GIS		x			
	5737 FAIRMOUNT AVE	GIS		x			
	5742 DEARBORN PKY	GIS		x			
	5811 FAIRMOUNT AVE	GIS		x			
	5705 DEARBORN PKY	GIS		x			
	5712 GRAND AVE	GIS		x			
	5724 GRAND AVE	GIS		x			
	5825 WALL PL	GIS		x			
	5820 FAIRVIEW AVE	GIS		x			
	5746 BUNNING DR	GIS		x			
	525 BUNNING DR	GIS		x			
	513 BUNNING DR	GIS		x			
	514 ELDON PL	GIS		x			
	5829 DEARBORN PKY	GIS		x			
	527 ELDON PL	GIS		x			
	515 ELDON PL	GIS		x			
	522 59TH ST	GIS		x			
	500 59TH ST	GIS		x			
	448 59TH ST	GIS		x			
	5905 BLODGETT AVE	GIS		x			
	401 59TH ST	GIS		x			
	5933 BLODGETT AVE	GIS		x			
	500 63RD ST	GIS		x			
	6210 GRAND AVE	GIS		x			
	6204 OSAGE AVE	GIS		x			
	6143 GRAND AVE	GIS		x			
	6126 OSAGE AVE	GIS		x			
	6102 FAIRVIEW AVE	GIS		x			
	6102 GRAND AVE	GIS		x			
	545 60TH ST	GIS		x			
	6010 GRAND AVE	GIS		x			
	6026 GRAND AVE	GIS		x			
	6034 GRAND AVE	GIS		x			
	6002 OSAGE AVE	GIS		x			
	6009 OSAGE AVE	GIS		x			
	6013 OSAGE AVE	GIS		x			
	6022 OSAGE AVE	GIS		x			
	243 55TH ST	GIS		x			
	233 55TH PL	GIS		x			
	143 55TH PL	GIS		x			
	234 56TH ST	GIS		x			
	210 56TH ST	GIS		x			
	142 56TH ST	GIS		x			
	113 56TH CT	GIS		x			
	5600 CUMNOR RD	GIS		x			
	5600 DEERPATH LN	GIS		x			
	5601 DEERPATH LN	GIS		x			

A.1 COMPLETE LIST OF ALL REPORTED PROBLEM AREAS IN ST. JOSEPH CREEK SOUTH WATERSHED

Problem Area ID	Location	Complaint Data Source	Problem Description				
			House	Basement	Garage	Yard	Street
	221 56TH ST	GIS		x			
	217 56TH ST	GIS		x			
	201 56TH ST	GIS		x			
	105 WHITE FAWN TRL	GIS		x			
	206 WHITE FAWN TRL	GIS		x			
	5641 DEERPATH LN	GIS		x			
	221 WHITE FAWN TRL	GIS		x			
	201 WHITE FAWN TRL	GIS		x			
	147 WHITE FAWN TRL	GIS		x			
	143 WHITE FAWN TRL	GIS		x			
	5634 HARMARC PL	GIS		x			
	5631 HARMARC PL	GIS		x			
	237 SEVENTH ST.	GIS		x			
	230 EIGHTH ST	GIS		x			
	5407 FAIRVIEW AVE	GIS		x			
	324 EIGHTH ST	GIS		x			
	320 EIGHTH ST	GIS		x			
	342 55TH ST	GIS		x			
	327 EIGHTH ST.	GIS		x			
	323 EIGHTH ST	GIS		x			
	311 EIGHTH ST	GIS		x			
	300 55TH ST	GIS		x			
	232 55TH ST	GIS		x			
	215 EIGHTH ST.	GIS		x			
	216 55TH ST	GIS		x			
	125 EIGHTH ST	GIS		x			
	122 55TH ST	GIS		x			
	113 EIGHTH ST	GIS		x			
	23 SEVENTH ST.	GIS		x			
	7 SEVENTH ST.	GIS		x			
	18 55TH ST	GIS		x			
	19 EIGHTH ST	GIS		x			
	3 EIGHTH ST	GIS		x			
	5325 FAIRVIEW AVE	GIS		x			
	325 SIXTH ST.	GIS		x			
	330 SEVENTH ST.	GIS		x			
	317 FIFTH ST	GIS		x			
	5305 FLORENCE AVE	GIS		x			
	235 FIFTH ST	GIS		x			
	5336 CUMNOR RD	GIS		x			
	5314 VICTOR ST	GIS		x			
	2 SIXTH ST	GIS		x			
	17 FOURTH ST	GIS		x			
	5228 WILLIAMS	GIS		x			
	314 FIFTH ST	GIS		x			
	236 -5TH ST	GIS		x			
	5234 CUMNOR RD	GIS		x			
	237 FOURTH ST.	GIS		x			
	5207 FAIRVIEW AVE	GIS		x			
	227 THIRD ST	GIS		x			
	345 SECOND ST	GIS		x			
	322 THIRD ST.	GIS		x			
	5137 FLORENCE AVE	GIS		x			
	5135 CUMNOR RD	GIS		x			
	116 FOURTH ST	GIS		x			
	112 FOURTH ST.	GIS		x			
	108 FOURTH ST	GIS		x			
	101 SECOND ST.	GIS		x			
	40 SECOND ST	GIS		x			
	13 SECOND ST	GIS		x			
	6133 DUNHAM RD	GIS	x				
	1210 WALLEN PL	GIS	x				
	845 KENYON AVE	GIS	x				
	835 KENYON ST	GIS	x				
	5520 LYMAN AVE	GIS	x				
	5712 GRAND AVE	GIS	x				
	237 SEVENTH ST.	GIS	x				
	5724 SPRINGSIDE AVE	GIS					x
	5709 PLYMOUTH ST	GIS					x
	5630 HILLCREST RD	GIS					x

A.1 COMPLETE LIST OF ALL REPORTED PROBLEM AREAS IN ST. JOSEPH CREEK SOUTH WATERSHED

Problem Area ID	Location	Complaint Data Source	Problem Description				
			House	Basement	Garage	Yard	Street
	6133 DUNHAM RD	GIS					x
	6005 BROOKBANK RD	GIS					x
	6003 CARPENTER ST	GIS					x
	5804 WASHINGTON ST	GIS					x
	5638 WEBSTER ST	GIS					x
	5627 WEBSTER ST	GIS					x
	903 KENYON ST	GIS					x
	845 KENYON AVE	GIS					x
	835 KENYON ST	GIS					x
	5606 LYMAN AVE	GIS					x
	5500 WEBSTER ST	GIS					x
	5424 WEBSTER ST	GIS					x
	6135 OSAGE AVE	GIS					x
	525 BUNNING DR	GIS					x
	549 57TH ST	GIS					x
	5712 WANDA PL	GIS					x
	142 56TH ST	GIS					x
	222 56TH ST	GIS					x
	234 56TH ST	GIS					x
	5601 DEERPATH LN	GIS					x
	246 WHITE FAWN TRL	GIS					x
	217 56TH ST	GIS					x
	5640 DEERPATH LN	GIS					x
	201 WHITE FAWN TRL	GIS					x
	147 WHITE FAWN TRL	GIS					x
	143 WHITE FAWN TRL	GIS					x
	105 WHITE FAWN TRL	GIS					x
	107 55TH ST	GIS					x
	5420 GRAND AVE	GIS					x
	5310 GRAND AVE	GIS					x
	5210 GRAND AVE	GIS					x
	122 55TH ST	GIS					x
	18 55TH ST	GIS					x
	5416 CUMNOR RD	GIS					x
	311 EIGHTH ST	GIS					x
	327 EIGHTH ST.	GIS					x
	315 SIXTH ST	GIS					x
	314 FIFTH ST	GIS					x
	5336 CUMNOR RD	GIS					x
	5135 CUMNOR RD	GIS					x
	5200 CUMNOR RD	GIS					x
	5709 AUBREY TER	GIS					x
	5724 SPRINGSIDE AVE	GIS					x
	5804 AUBREY TERR	GIS					x
	5840 SPRINGSIDE	GIS					x
	5850 SPRINGSIDE AVE	GIS					x
	5708 PLYMOUTH ST	GIS					x
	5716 PLYMOUTH ST	GIS					x
	5701 PLYMOUTH ST	GIS					x
	1520 JEFFERSON AVE	GIS					x
	5630 HILLCREST RD	GIS					x
	5648 HILLCREST RD	GIS					x
	5720 MIDDGAUGH AVE	GIS					x
	5732 MIDDGAUGH AVE	GIS					x
	1415 RIDGEWOOD CIR	GIS					x
	1409 RIDGEWOOD CIR	GIS					x
	1210 WALLEN PL	GIS					x
	6133 DUNHAM RD	GIS					x
	6005 DUNHAM RD	GIS					x
	1308 59TH ST	GIS					x
	5831 MIDDGAUGH AVE	GIS					x
	5802 MIDDGAUGH AVE	GIS					x
	1221 JEFFERSON AVE	GIS					x
	1215 JEFFERSON AVE	GIS					x
	6005 BROOKBANK RD	GIS					x
	6003 CARPENTER ST	GIS					x
	6025 CARPENTER ST	GIS					x
	5728 MAIN ST	GIS					x
	5829 CARPENTER ST	GIS					x
	5812 MAIN ST.	GIS					x

A.1 COMPLETE LIST OF ALL REPORTED PROBLEM AREAS IN ST. JOSEPH CREEK SOUTH WATERSHED

Problem Area ID	Location	Complaint Data Source	Problem Description				
			House	Basement	Garage	Yard	Street
	5817 WEBSTER ST	GIS				x	
	5753 WEBSTER ST	GIS				x	
	5738 WEBSTER	GIS				x	
	5712 WEBSTER ST	GIS				x	
	5638 WEBSTER ST	GIS				x	
	5627 WEBSTER ST	GIS				x	
	5618 WEBSTER ST	GIS				x	
	903 KENYON ST	GIS				x	
	845 KENYON AVE	GIS				x	
	5508 WASHINGTON ST	GIS				x	
	5500 WEBSTER ST	GIS				x	
	5340 LYMAN AVE	GIS				x	
	5424 WEBSTER ST	GIS				x	
	5513 WASHINGTON ST	GIS				x	
	5606 LYMAN AVE	GIS				x	
	5817 WASHINGTON ST	GIS				x	
	5340 PARK AVE	GIS				x	
	5525 LYMAN AVE	GIS				x	
	5616 FAIRMOUNT AVE	GIS				x	
	5725 LYMAN AVE	GIS				x	
	5821 LYMAN AVE	GIS				x	
	5827 LYMAN	GIS				x	
	6227 BLODGETT AVE	GIS				x	
	6143 GRAND AVE	GIS				x	
	6142 OSAGE AVE	GIS				x	
	6029 GRAND AVE	GIS				x	
	6030 OSAGE AVE	GIS				x	
	5914 GRAND AVE	GIS				x	
	443 59TH ST	GIS				x	
	419 57TH ST	GIS				x	
	5541 FAIRMOUNT	GIS				x	
	5650 DEERPATH LN	GIS				x	
	5640 DEERPATH LN	GIS				x	
	5600 DEERPATH LN	GIS				x	
	5543 WILCOX AVE	GIS				x	
	5601 DEERPATH LN	GIS				x	
	221 56TH ST	GIS				x	
	216 WHITE FAWN TRL	GIS				x	
	201 WHITE FAWN TRL	GIS				x	
	147 WHITE FAWN TRL	GIS				x	
	5631 HARMARC PL	GIS				x	
	210 56TH ST	GIS				x	
	142 56TH ST	GIS				x	
	5600 CUMNOR RD	GIS				x	
	106 56TH CT	GIS				x	
	209 55TH ST	GIS				x	
	5345 BLODGETT AVE	GIS				x	
	5421 BLODGETT AVE	GIS				x	
	5420 GRAND AVE	GIS				x	
	5140 GRAND AVE	GIS				x	
	229 8TH STREET	GIS				x	
	216 55TH ST	GIS				x	
	128 55TH ST	GIS				x	
	122 55TH ST	GIS				x	
	125 EIGHTH ST	GIS				x	
	3 EIGHTH ST	GIS				x	
	5325 FAIRVIEW AVE	GIS				x	
	315 SIXTH ST	GIS				x	
	5330 CUMNOR RD	GIS				x	
	5336 CUMNOR RD	GIS				x	
	235 FIFTH ST	GIS				x	
	5200 CUMNOR RD	GIS				x	
	5219 CUMNOR RD	GIS				x	
	5135 CUMNOR RD	GIS				x	
	101 SECOND ST.	GIS				x	
	17 FOURTH ST	GIS				x	
	5 FOURTH ST	GIS				x	
	5228 WILLIAMS	GIS				x	
	5232 WILLIAMS ST	GIS				x	

Conceptual Engineer's Estimated Opinion of Probable Construction Cost

St. Joseph Creek South Watershed

Sub Watershed A

STORMWATER PROJECTS COST				
ITEM	Unit	Unit Cost	Quantity	Cost
12-inch Storm Sewer	LF	\$90	450	\$40,500
15-inch Storm Sewer	LF	\$100	0	\$0
18-inch Storm Sewer	LF	\$110	950	\$104,500
24-inch Storm Sewer	LF	\$120	600	\$72,000
27-inch Storm Sewer	LF	\$125	0	\$0
30-inch Storm Sewer, 6-10 ft deep	LF	\$125	450	\$56,250
30-inch Storm Sewer, 10-14 ft deep	LF	\$130	0	\$0
36-inch Storm Sewer, 6-10 ft deep	LF	\$140	650	\$91,000
36-inch Storm Sewer, 10-14 ft deep	LF	\$145	0	\$0
42-inch Storm Sewer, 6-10 ft deep	LF	\$170	0	\$0
42-inch Storm Sewer, 10-14 ft deep	LF	\$175	1300	\$227,500
48-inch Storm Sewer, 6-10 ft deep	LF	\$190	0	\$0
48-inch Storm Sewer, 10-14 ft deep	LF	\$195	0	\$0
54-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
54-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
60-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
60-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
72-inch Storm Sewer, 6-10 ft deep	LF	\$300	0	\$0
72-inch Storm Sewer, 10-14 ft deep	LF	\$320	0	\$0
78-inch Storm Sewer, 10-14 ft deep	LF	\$350	0	\$0
Precast Manhole, 4-ft diameter, 4-10 ft deep	EA	\$2,850	32	\$91,200
Precast Manhole, 4-ft diameter, 10-14 ft deep	EA	\$3,100	0	\$0
Precast Manhole, 6-ft diameter, 4-10 ft deep	EA	\$4,000	3	\$12,000
Precast Manhole, 6-ft diameter, 10-14 ft deep	EA	\$4,950	4	\$19,800
Structure Cleaning	EA	\$150	0	\$0
Outfall Repair or Replace	EA	\$2,000	2	\$4,000
Storm Sewer Inlet Repair or Replace	EA	\$2,000	0	\$0
Pavement Patching	SY	\$45	0	\$0
Roadway Resurfacing	LF	\$220	1000	\$220,000
Roadway Reconstruction	LF	\$1,000	1100	\$1,100,000
Seeding and Surface Restoration	AC	\$3,000	0	\$0
Roadway Ditch	LF	\$0	0	\$0
Driveway Culvert Replacement	EA	\$2,000	0	\$0
Above Ground Stormwater Storage Facility	AC-FT	\$200,000	35	\$7,000,000
Underground Stormwater Storage Facility	AC-FT	\$500,000	0	\$0
Stormwater Storage Facility Retrofit	EA	\$12,000	0	\$0
Tideflex Check Valve	EA	\$10,000	0	\$0
Wetland Mitigation	AC	\$175,000	10.5	\$1,837,500
Small Channel Maintenance (brush/debris removal)	LF	\$5	0	\$0
Large Channel Maintenance (debris removal, dredging)	LF	\$100	0	\$0
Streambank Stabilization	LF	\$200	0	\$0
Easement Purchasing	Each	\$100,000	36	\$3,600,000
Property Purchasing	Each	\$500,000	0	\$0
SUBTOTAL CONSTRUCTION COST				\$14,476,250
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$2,895,250
Contingency (Water Quality Requirements) (10%)				\$1,447,625
Design and Construction Engineering (15%)				\$2,171,438
TOTAL ESTIMATED COST				\$20,990,563
GENERAL IMPROVEMENT COST				
Rural Road Updating to Urban Roadways	LF	\$500	8,000	\$4,000,000
New Storm Sewer	LF	\$90	600	\$54,000
SUBTOTAL CONSTRUCTION COST				\$4,054,000
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$810,800
Contingency (Water Quality Requirements) (10%)				\$405,400
Design and Construction Engineering (15%)				\$608,100
TOTAL ESTIMATED COST				\$5,878,300
TOTAL CONSTRUCTION COST				\$26,868,863

Tables A1.2 & A1.2.1

Conceptual Engineer's Estimated Opinion of Probable Construction Cost

St. Joseph Creek South Watershed

Sub Watershed B

STORMWATER PROJECTS COST				
ITEM	Unit	Unit Cost	Quantity	Cost
12-inch Storm Sewer	LF	\$90	0	\$0
15-inch Storm Sewer	LF	\$100	0	\$0
18-inch Storm Sewer	LF	\$110	0	\$0
24-inch Storm Sewer	LF	\$120	1600	\$192,000
27-inch Storm Sewer	LF	\$125	0	\$0
30-inch Storm Sewer, 6-10 ft deep	LF	\$125	0	\$0
30-inch Storm Sewer, 10-14 ft deep	LF	\$130	0	\$0
36-inch Storm Sewer, 6-10 ft deep	LF	\$140	0	\$0
36-inch Storm Sewer, 10-14 ft deep	LF	\$145	0	\$0
42-inch Storm Sewer, 6-10 ft deep	LF	\$170	0	\$0
42-inch Storm Sewer, 10-14 ft deep	LF	\$175	0	\$0
48-inch Storm Sewer, 6-10 ft deep	LF	\$190	0	\$0
48-inch Storm Sewer, 10-14 ft deep	LF	\$195	0	\$0
54-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
54-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
60-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
60-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
72-inch Storm Sewer, 6-10 ft deep	LF	\$300	0	\$0
72-inch Storm Sewer, 10-14 ft deep	LF	\$320	0	\$0
78-inch Storm Sewer, 10-14 ft deep	LF	\$350	0	\$0
Precast Manhole, 4-ft diameter, 4-10 ft deep	EA	\$2,850	16	\$45,600
Precast Manhole, 4-ft diameter, 10-14 ft deep	EA	\$3,100	0	\$0
Precast Manhole, 6-ft diameter, 4-10 ft deep	EA	\$4,000	0	\$0
Precast Manhole, 6-ft diameter, 10-14 ft deep	EA	\$4,950	0	\$0
Structure Cleaning	EA	\$150	0	\$0
Outfall Repair or Replace	EA	\$2,000	2	\$4,000
Storm Sewer Inlet Repair or Replace	EA	\$2,000	0	\$0
Pavement Patching	SY	\$45	0	\$0
Roadway Resurfacing	LF	\$220	0	\$0
Roadway Reconstruction	LF	\$1,000	0	\$0
Seeding and Surface Restoration	AC	\$3,000	0	\$0
Roadway Ditch	LF	\$0	0	\$0
Driveway Culvert Replacement	EA	\$2,000	0	\$0
Above Ground Stormwater Storage Facility	AC-FT	\$200,000	22	\$4,400,000
Underground Stormwater Storage Facility	AC-FT	\$500,000	0	\$0
Stormwater Storage Facility Retrofit	EA	\$12,000	0	\$0
Tideflex Check Valve	EA	\$10,000	0	\$0
Wetland Mitigation	AC	\$175,000	0.3	\$52,500
Small Channel Maintenance (brush/debris removal)	LF	\$5	0	\$0
Large Channel Maintenance (debris removal, dredging)	LF	\$100	750	\$75,000
Streambank Stabilization	LF	\$200	750	\$150,000
Easement Purchasing	Each	\$100,000	32	\$3,200,000
Property Purchasing	Each	\$500,000	0	\$0
SUBTOTAL CONSTRUCTION COST				\$8,119,100
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$1,623,820
Contingency (Water Quality Requirements) (10%)				\$811,910
Design and Construction Engineering (15%)				\$1,217,865
TOTAL ESTIMATED COST				\$11,772,695
GENERAL IMPROVEMENT COST				
Rural Road Updating to Urban Roadways	LF	\$500	3,000	\$1,500,000
New Storm Sewer	LF	\$90	1,000	\$90,000
SUBTOTAL CONSTRUCTION COST				\$1,590,000
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$318,000
Contingency (Water Quality Requirements) (10%)				\$159,000
Design and Construction Engineering (15%)				\$238,500
TOTAL ESTIMATED COST				\$2,305,500
TOTAL CONSTRUCTION COST				\$14,078,195

Tables A1.3 & A1.3.1

Conceptual Engineer's Estimated Opinion of Probable Construction Cost

St. Joseph Creek South Watershed

Sub Watershed C

STORMWATER PROJECTS COST				
ITEM	Unit	Unit Cost	Quantity	Cost
12-inch Storm Sewer	LF	\$90	1,400	\$126,000
15-inch Storm Sewer	LF	\$100	0	\$0
18-inch Storm Sewer	LF	\$110	3,500	\$385,000
24-inch Storm Sewer	LF	\$120	2,300	\$276,000
27-inch Storm Sewer	LF	\$125	0	\$0
30-inch Storm Sewer, 6-10 ft deep	LF	\$125	350	\$43,750
30-inch Storm Sewer, 10-14 ft deep	LF	\$130	0	\$0
36-inch Storm Sewer, 6-10 ft deep	LF	\$140	1,000	\$140,000
36-inch Storm Sewer, 10-14 ft deep	LF	\$145	0	\$0
42-inch Storm Sewer, 6-10 ft deep	LF	\$170	0	\$0
42-inch Storm Sewer, 10-14 ft deep	LF	\$175	0	\$0
48-inch Storm Sewer, 6-10 ft deep	LF	\$190	0	\$0
48-inch Storm Sewer, 10-14 ft deep	LF	\$195	0	\$0
54-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
54-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
60-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
60-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
72-inch Storm Sewer, 6-10 ft deep	LF	\$300	0	\$0
72-inch Storm Sewer, 10-14 ft deep	LF	\$320	0	\$0
78-inch Storm Sewer, 10-14 ft deep	LF	\$350	0	\$0
Precast Manhole, 4-ft diameter, 4-10 ft deep	EA	\$2,850	65	\$185,250
Precast Manhole, 4-ft diameter, 10-14 ft deep	EA	\$3,100	0	\$0
Precast Manhole, 6-ft diameter, 4-10 ft deep	EA	\$4,000	0	\$0
Precast Manhole, 6-ft diameter, 10-14 ft deep	EA	\$4,950	0	\$0
Structure Cleaning	EA	\$150	0	\$0
Outfall Repair or Replace	EA	\$2,000	16	\$32,000
Storm Sewer Inlet Repair or Replace	EA	\$2,000	0	\$0
Pavement Patching	SY	\$45	0	\$0
Roadway Resurfacing	LF	\$220	900	\$198,000
Roadway Reconstruction	LF	\$1,000	0	\$0
Seeding and Surface Restoration	AC	\$3,000	0	\$0
Roadway Ditch	LF	\$0	0	\$0
Driveway Culvert Replacement	EA	\$2,000	0	\$0
Above Ground Stormwater Storage Facility	AC-FT	\$200,000	15	\$3,000,000
Underground Stormwater Storage Facility	AC-FT	\$500,000	0	\$0
Stormwater Storage Facility Retrofit	EA	\$12,000	0	\$0
Tideflex Check Valve	EA	\$10,000	0	\$0
Wetland Mitigation	AC	\$175,000	3.7	\$647,500
Small Channel Maintenance (brush/debris removal)	LF	\$5	0	\$0
Large Channel Maintenance (debris removal, dredging)	LF	\$100	2,000	\$200,000
Streambank Stabilization	LF	\$200	2,000	\$400,000
Easement Purchasing	Each	\$100,000	0	\$0
Property Purchasing	Each	\$500,000	0	\$0
SUBTOTAL CONSTRUCTION COST				\$5,633,500
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$1,126,700
Contingency (Water Quality Requirements) (10%)				\$563,350
Design and Construction Engineering (15%)				\$845,025
TOTAL ESTIMATED COST				\$8,168,575
GENERAL IMPROVEMENT COST				
Rural Road Updating to Urban Roadways	LF	\$500	13,600	\$6,800,000
New Storm Sewer	LF	\$90	6,100	\$549,000
SUBTOTAL CONSTRUCTION COST				\$7,349,000
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$1,469,800
Contingency (Water Quality Requirements) (10%)				\$734,900
Design and Construction Engineering (15%)				\$1,102,350
TOTAL ESTIMATED COST				\$10,656,050
TOTAL CONSTRUCTION COST				\$18,824,625

Tables A1.4 & A1.4.1

Conceptual Engineer's Estimated Opinion of Probable Construction Cost

St. Joseph Creek South Watershed

Sub Watershed D

STORMWATER PROJECTS COST				
ITEM	Unit	Unit Cost	Quantity	Cost
12-inch Storm Sewer	LF	\$90	0	\$0
15-inch Storm Sewer	LF	\$100	0	\$0
18-inch Storm Sewer	LF	\$110	0	\$0
24-inch Storm Sewer	LF	\$120	70	\$8,400
27-inch Storm Sewer	LF	\$125	0	\$0
30-inch Storm Sewer, 6-10 ft deep	LF	\$125	0	\$0
30-inch Storm Sewer, 10-14 ft deep	LF	\$130	0	\$0
36-inch Storm Sewer, 6-10 ft deep	LF	\$140	0	\$0
36-inch Storm Sewer, 10-14 ft deep	LF	\$145	0	\$0
42-inch Storm Sewer, 6-10 ft deep	LF	\$170	0	\$0
42-inch Storm Sewer, 10-14 ft deep	LF	\$175	0	\$0
48-inch Storm Sewer, 6-10 ft deep	LF	\$190	0	\$0
48-inch Storm Sewer, 10-14 ft deep	LF	\$195	0	\$0
54-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
54-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
60-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
60-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
72-inch Storm Sewer, 6-10 ft deep	LF	\$300	0	\$0
72-inch Storm Sewer, 10-14 ft deep	LF	\$320	0	\$0
78-inch Storm Sewer, 10-14 ft deep	LF	\$350	0	\$0
Precast Manhole, 4-ft diameter, 4-10 ft deep	EA	\$2,850	0	\$0
Precast Manhole, 4-ft diameter, 10-14 ft deep	EA	\$3,100	0	\$0
Precast Manhole, 6-ft diameter, 4-10 ft deep	EA	\$4,000	0	\$0
Precast Manhole, 6-ft diameter, 10-14 ft deep	EA	\$4,950	0	\$0
Structure Cleaning	EA	\$150	0	\$0
Outfall Repair or Replace	EA	\$2,000	3	\$6,000
Storm Sewer Inlet Repair or Replace	EA	\$2,000	0	\$0
Pavement Patching	SY	\$45	0	\$0
Roadway Resurfacing	LF	\$220	0	\$0
Roadway Reconstruction	LF	\$1,000	0	\$0
Seeding and Surface Restoration	AC	\$3,000	0	\$0
Roadway Ditch	LF	\$0	0	\$0
Driveway Culvert Replacement	EA	\$2,000	0	\$0
Above Ground Stormwater Storage Facility	AC-FT	\$200,000	0	\$0
Underground Stormwater Storage Facility	AC-FT	\$500,000	0	\$0
Stormwater Storage Facility Retrofit	EA	\$12,000	0	\$0
Tideflex Check Valve	EA	\$10,000	0	\$0
Wetland Mitigation	AC	\$175,000	0.9	\$157,500
Small Channel Maintenance (brush/debris removal)	LF	\$5	0	\$0
Large Channel Maintenance (debris removal, dredging)	LF	\$100	800	\$80,000
Streambank Stabilization	LF	\$200	0	\$0
Easement Purchasing	Each	\$100,000	0	\$0
Property Purchasing	Each	\$500,000	0	\$0
SUBTOTAL CONSTRUCTION COST				\$251,900
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$50,380
Contingency (Water Quality Requirements) (10%)				\$25,190
Design and Construction Engineering (15%)				\$37,785
TOTAL ESTIMATED COST				\$365,255
GENERAL IMPROVEMENT COST				
Rural Road Updating to Urban Roadways	LF	\$500	0	\$0
New Storm Sewer	LF	\$90	1,500	\$135,000
SUBTOTAL CONSTRUCTION COST				\$135,000
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$27,000
Contingency (Water Quality Requirements) (10%)				\$13,500
Design and Construction Engineering (15%)				\$20,250
TOTAL ESTIMATED COST				\$195,750
TOTAL CONSTRUCTION COST				\$561,005

Tables A1.5 & A1.5.1

Conceptual Engineer's Estimated Opinion of Probable Construction Cost

St. Joseph Creek South Watershed

Sub Watershed E

STORMWATER PROJECTS COST				
ITEM	Unit	Unit Cost	Quantity	Cost
12-inch Storm Sewer	LF	\$90	1,400	\$126,000
15-inch Storm Sewer	LF	\$100	0	\$0
18-inch Storm Sewer	LF	\$110	830	\$91,300
24-inch Storm Sewer	LF	\$120	0	\$0
27-inch Storm Sewer	LF	\$125	0	\$0
30-inch Storm Sewer, 6-10 ft deep	LF	\$125	0	\$0
30-inch Storm Sewer, 10-14 ft deep	LF	\$130	0	\$0
36-inch Storm Sewer, 6-10 ft deep	LF	\$140	0	\$0
36-inch Storm Sewer, 10-14 ft deep	LF	\$145	0	\$0
42-inch Storm Sewer, 6-10 ft deep	LF	\$170	0	\$0
42-inch Storm Sewer, 10-14 ft deep	LF	\$175	0	\$0
48-inch Storm Sewer, 6-10 ft deep	LF	\$190	0	\$0
48-inch Storm Sewer, 10-14 ft deep	LF	\$195	0	\$0
54-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
54-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
60-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
60-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
72-inch Storm Sewer, 6-10 ft deep	LF	\$300	0	\$0
72-inch Storm Sewer, 10-14 ft deep	LF	\$320	0	\$0
78-inch Storm Sewer, 10-14 ft deep	LF	\$350	0	\$0
Precast Manhole, 4-ft diameter, 4-10 ft deep	EA	\$2,850	21	\$59,850
Precast Manhole, 4-ft diameter, 10-14 ft deep	EA	\$3,100	0	\$0
Precast Manhole, 6-ft diameter, 4-10 ft deep	EA	\$4,000	0	\$0
Precast Manhole, 6-ft diameter, 10-14 ft deep	EA	\$4,950	0	\$0
Structure Cleaning	EA	\$150	0	\$0
Outfall Repair or Replace	EA	\$2,000	1	\$2,000
Storm Sewer Inlet Repair or Replace	EA	\$2,000	0	\$0
Pavement Patching	SY	\$45	0	\$0
Roadway Resurfacing	LF	\$220	1,150	\$253,000
Roadway Reconstruction	LF	\$1,000	0	\$0
Seeding and Surface Restoration	AC	\$3,000	0	\$0
Roadway Ditch	LF	\$0	0	\$0
Driveway Culvert Replacement	EA	\$2,000	0	\$0
Above Ground Stormwater Storage Facility	AC-FT	\$200,000	0	\$0
Underground Stormwater Storage Facility	AC-FT	\$500,000	0	\$0
Stormwater Storage Facility Retrofit	EA	\$12,000	0	\$0
Tideflex Check Valve	EA	\$10,000	0	\$0
Wetland Mitigation	AC	\$175,000	2.2	\$385,000
Small Channel Maintenance (brush/debris removal)	LF	\$5	600	\$3,000
Large Channel Maintenance (debris removal, dredging)	LF	\$100	670	\$67,000
Streambank Stabilization	LF	\$200	670	\$134,000
Easement Purchasing	Each	\$100,000	0	\$0
Property Purchasing	Each	\$500,000	0	\$0
SUBTOTAL CONSTRUCTION COST				\$1,121,150
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$224,230
Contingency (Water Quality Requirements) (10%)				\$112,115
Design and Construction Engineering (15%)				\$168,173
TOTAL ESTIMATED COST				\$1,625,668
GENERAL IMPROVEMENT COST				
Rural Road Updating to Urban Roadways	LF	\$500	0	\$0
New Storm Sewer	LF	\$90	1,100	\$99,000
SUBTOTAL CONSTRUCTION COST				\$99,000
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$19,800
Contingency (Water Quality Requirements) (10%)				\$9,900
Design and Construction Engineering (15%)				\$14,850
TOTAL ESTIMATED COST				\$143,550
TOTAL CONSTRUCTION COST				\$1,769,218

Tables A1.6 & A1.6.1

Conceptual Engineer's Estimated Opinion of Probable Construction Cost

St. Joseph Creek South Watershed

Sub Watershed F

STORMWATER PROJECTS COST				
ITEM	Unit	Unit Cost	Quantity	Cost
12-inch Storm Sewer	LF	\$90	390	\$35,100
15-inch Storm Sewer	LF	\$100	0	\$0
18-inch Storm Sewer	LF	\$110	905	\$99,550
24-inch Storm Sewer	LF	\$120	700	\$84,000
27-inch Storm Sewer	LF	\$125	0	\$0
30-inch Storm Sewer, 6-10 ft deep	LF	\$125	1,725	\$215,625
30-inch Storm Sewer, 10-14 ft deep	LF	\$130	0	\$0
36-inch Storm Sewer, 6-10 ft deep	LF	\$140	0	\$0
36-inch Storm Sewer, 10-14 ft deep	LF	\$145	0	\$0
42-inch Storm Sewer, 6-10 ft deep	LF	\$170	0	\$0
42-inch Storm Sewer, 10-14 ft deep	LF	\$175	0	\$0
48-inch Storm Sewer, 6-10 ft deep	LF	\$190	0	\$0
48-inch Storm Sewer, 10-14 ft deep	LF	\$195	0	\$0
54-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
54-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
60-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
60-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
72-inch Storm Sewer, 6-10 ft deep	LF	\$300	0	\$0
72-inch Storm Sewer, 10-14 ft deep	LF	\$320	0	\$0
78-inch Storm Sewer, 10-14 ft deep	LF	\$350	0	\$0
Precast Manhole, 4-ft diameter, 4-10 ft deep	EA	\$2,850	17	\$48,450
Precast Manhole, 4-ft diameter, 10-14 ft deep	EA	\$3,100	0	\$0
Precast Manhole, 6-ft diameter, 4-10 ft deep	EA	\$4,000	18	\$72,000
Precast Manhole, 6-ft diameter, 10-14 ft deep	EA	\$4,950	0	\$0
Structure Cleaning	EA	\$150	0	\$0
Outfall Repair or Replace	EA	\$2,000	1	\$2,000
Storm Sewer Inlet Repair or Replace	EA	\$2,000	0	\$0
Pavement Patching	SY	\$45	0	\$0
Roadway Resurfacing	LF	\$220	3,500	\$770,000
Roadway Reconstruction	LF	\$1,000	0	\$0
Seeding and Surface Restoration	AC	\$3,000	0	\$0
Roadway Ditch	LF	\$0	0	\$0
Driveway Culvert Replacement	EA	\$2,000	0	\$0
Above Ground Stormwater Storage Facility	AC-FT	\$200,000	0	\$0
Underground Stormwater Storage Facility	AC-FT	\$500,000	0	\$0
Stormwater Storage Facility Retrofit	EA	\$12,000	0	\$0
Tideflex Check Valve	EA	\$10,000	0	\$0
Wetland Mitigation	AC	\$175,000	0	\$0
Small Channel Maintenance (brush/debris removal)	LF	\$5	0	\$0
Large Channel Maintenance (debris removal, dredging)	LF	\$100	0	\$0
Streambank Stabilization	LF	\$200	0	\$0
Easement Purchasing	Each	\$100,000	0	\$0
Property Purchasing	Each	\$500,000	0	\$0
SUBTOTAL CONSTRUCTION COST				\$1,326,725
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$265,345
Contingency (Water Quality Requirements) (10%)				\$132,673
Design and Construction Engineering (15%)				\$199,009
TOTAL ESTIMATED COST				\$1,923,751
GENERAL IMPROVEMENT COST				
Rural Road Updating to Urban Roadways	LF	\$500	3,300	\$1,650,000
New Storm Sewer	LF	\$90	9,800	\$882,000
SUBTOTAL CONSTRUCTION COST				\$2,532,000
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$506,400
Contingency (Water Quality Requirements) (10%)				\$253,200
Design and Construction Engineering (15%)				\$379,800
TOTAL ESTIMATED COST				\$3,671,400
TOTAL CONSTRUCTION COST				\$5,595,151

Tables A1.7 & A1.7.1

Conceptual Engineer's Estimated Opinion of Probable Construction Cost

St. Joseph Creek South Watershed

Sub Watershed G

STORMWATER PROJECTS COST				
ITEM	Unit	Unit Cost	Quantity	Cost
12-inch Storm Sewer	LF	\$90	215	\$19,350
15-inch Storm Sewer	LF	\$100	0	\$0
18-inch Storm Sewer	LF	\$110	1,070	\$117,700
24-inch Storm Sewer	LF	\$120	400	\$48,000
27-inch Storm Sewer	LF	\$125	100	\$12,500
30-inch Storm Sewer, 6-10 ft deep	LF	\$125	195	\$24,375
30-inch Storm Sewer, 10-14 ft deep	LF	\$130	0	\$0
36-inch Storm Sewer, 6-10 ft deep	LF	\$140	60	\$8,400
36-inch Storm Sewer, 10-14 ft deep	LF	\$145	0	\$0
42-inch Storm Sewer, 6-10 ft deep	LF	\$170	0	\$0
42-inch Storm Sewer, 10-14 ft deep	LF	\$175	0	\$0
48-inch Storm Sewer, 6-10 ft deep	LF	\$190	0	\$0
48-inch Storm Sewer, 10-14 ft deep	LF	\$195	0	\$0
54-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
54-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
60-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
60-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
72-inch Storm Sewer, 6-10 ft deep	LF	\$300	0	\$0
72-inch Storm Sewer, 10-14 ft deep	LF	\$320	0	\$0
78-inch Storm Sewer, 10-14 ft deep	LF	\$350	0	\$0
Precast Manhole, 4-ft diameter, 4-10 ft deep	EA	\$2,850	16	\$45,600
Precast Manhole, 4-ft diameter, 10-14 ft deep	EA	\$3,100	0	\$0
Precast Manhole, 6-ft diameter, 4-10 ft deep	EA	\$4,000	4	\$16,000
Precast Manhole, 6-ft diameter, 10-14 ft deep	EA	\$4,950	0	\$0
Structure Cleaning	EA	\$150	0	\$0
Outfall Repair or Replace	EA	\$2,000	1	\$2,000
Storm Sewer Inlet Repair or Replace	EA	\$2,000	0	\$0
Pavement Patching	SY	\$45	0	\$0
Roadway Resurfacing	LF	\$220	1,865	\$410,300
Roadway Reconstruction	LF	\$1,000	0	\$0
Seeding and Surface Restoration	AC	\$3,000	0	\$0
Roadway Ditch	LF	\$0	0	\$0
Driveway Culvert Replacement	EA	\$2,000	0	\$0
Above Ground Stormwater Storage Facility	AC-FT	\$200,000	0	\$0
Underground Stormwater Storage Facility	AC-FT	\$500,000	0	\$0
Stormwater Storage Facility Retrofit	EA	\$12,000	0	\$0
Tideflex Check Valve	EA	\$10,000	0	\$0
Wetland Mitigation	AC	\$175,000	3.6	\$630,000
Small Channel Maintenance (brush/debris removal)	LF	\$5	0	\$0
Large Channel Maintenance (debris removal, dredging)	LF	\$100	2,000	\$200,000
Streambank Stabilization	LF	\$200	0	\$0
Easement Purchasing	Each	\$100,000	0	\$0
Property Purchasing	Each	\$500,000	0	\$0
SUBTOTAL CONSTRUCTION COST				\$1,534,225
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$306,845
Contingency (Water Quality Requirements) (10%)				\$153,423
Design and Construction Engineering (15%)				\$230,134
TOTAL ESTIMATED COST				\$2,224,626
GENERAL IMPROVEMENT COST				
Rural Road Updating to Urban Roadways	LF	\$500	0	\$0
New Storm Sewer	LF	\$90	2,500	\$225,000
SUBTOTAL CONSTRUCTION COST				\$225,000
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$45,000
Contingency (Water Quality Requirements) (10%)				\$22,500
Design and Construction Engineering (15%)				\$33,750
TOTAL ESTIMATED COST				\$326,250
TOTAL CONSTRUCTION COST				\$2,550,876

Tables A1.8 & A1.8.1

Conceptual Engineer's Estimated Opinion of Probable Construction Cost

St. Joseph Creek South Watershed

Sub Watershed H

STORMWATER PROJECTS COST				
ITEM	Unit	Unit Cost	Quantity	Cost
12-inch Storm Sewer	LF	\$90	0	\$0
15-inch Storm Sewer	LF	\$100	0	\$0
18-inch Storm Sewer	LF	\$110	0	\$0
24-inch Storm Sewer	LF	\$120	0	\$0
27-inch Storm Sewer	LF	\$125	0	\$0
30-inch Storm Sewer, 6-10 ft deep	LF	\$125	0	\$0
30-inch Storm Sewer, 10-14 ft deep	LF	\$130	0	\$0
36-inch Storm Sewer, 6-10 ft deep	LF	\$140	0	\$0
36-inch Storm Sewer, 10-14 ft deep	LF	\$145	0	\$0
42-inch Storm Sewer, 6-10 ft deep	LF	\$170	0	\$0
42-inch Storm Sewer, 10-14 ft deep	LF	\$175	0	\$0
48-inch Storm Sewer, 6-10 ft deep	LF	\$190	0	\$0
48-inch Storm Sewer, 10-14 ft deep	LF	\$195	0	\$0
54-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
54-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
60-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
60-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
72-inch Storm Sewer, 6-10 ft deep	LF	\$300	0	\$0
72-inch Storm Sewer, 10-14 ft deep	LF	\$320	0	\$0
78-inch Storm Sewer, 10-14 ft deep	LF	\$350	0	\$0
Precast Manhole, 4-ft diameter, 4-10 ft deep	EA	\$2,850	0	\$0
Precast Manhole, 4-ft diameter, 10-14 ft deep	EA	\$3,100	0	\$0
Precast Manhole, 6-ft diameter, 4-10 ft deep	EA	\$4,000	0	\$0
Precast Manhole, 6-ft diameter, 10-14 ft deep	EA	\$4,950	0	\$0
Structure Cleaning	EA	\$150	0	\$0
Outfall Repair or Replace	EA	\$2,000	0	\$0
Storm Sewer Inlet Repair or Replace	EA	\$2,000	0	\$0
Pavement Patching	SY	\$45	0	\$0
Roadway Resurfacing	LF	\$220	0	\$0
Roadway Reconstruction	LF	\$1,000	0	\$0
Seeding and Surface Restoration	AC	\$3,000	0	\$0
Roadway Ditch	LF	\$0	0	\$0
Driveway Culvert Replacement	EA	\$2,000	0	\$0
Above Ground Stormwater Storage Facility	AC-FT	\$200,000	0	\$0
Underground Stormwater Storage Facility	AC-FT	\$500,000	0	\$0
Stormwater Storage Facility Retrofit	EA	\$12,000	0	\$0
Tideflex Check Valve	EA	\$10,000	0	\$0
Wetland Mitigation	AC	\$175,000	0	\$0
Small Channel Maintenance (brush/debris removal)	LF	\$5	0	\$0
Large Channel Maintenance (debris removal, dredging)	LF	\$100	600	\$60,000
Streambank Stabilization	LF	\$200	2,300	\$460,000
Easement Purchasing	Each	\$100,000	0	\$0
Property Purchasing	Each	\$500,000	0	\$0
SUBTOTAL CONSTRUCTION COST				\$520,000
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$104,000
Contingency (Water Quality Requirements) (10%)				\$52,000
Design and Construction Engineering (15%)				\$78,000
TOTAL ESTIMATED COST				\$754,000
GENERAL IMPROVEMENT COST				
Rural Road Updating to Urban Roadways	LF	\$500	0	\$0
New Storm Sewer	LF	\$90	900	\$81,000
SUBTOTAL CONSTRUCTION COST				\$81,000
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$16,200
Contingency (Water Quality Requirements) (10%)				\$8,100
Design and Construction Engineering (15%)				\$12,150
TOTAL ESTIMATED COST				\$117,450
TOTAL CONSTRUCTION COST				\$871,450

Tables A1.9 & A1.9.1

Conceptual Engineer's Estimated Opinion of Probable Construction Cost

St. Joseph Creek South Watershed

Sub Watershed I

STORMWATER PROJECTS COST					
ITEM	Unit	Unit Cost	Quantity	Cost	
12-inch Storm Sewer	LF	\$90	70	\$6,300	
15-inch Storm Sewer	LF	\$100	70	\$7,000	
18-inch Storm Sewer	LF	\$110	120	\$13,200	
24-inch Storm Sewer	LF	\$120	0	\$0	
27-inch Storm Sewer	LF	\$125	0	\$0	
30-inch Storm Sewer, 6-10 ft deep	LF	\$125	0	\$0	
30-inch Storm Sewer, 10-14 ft deep	LF	\$130	0	\$0	
36-inch Storm Sewer, 6-10 ft deep	LF	\$140	110	\$15,400	
36-inch Storm Sewer, 10-14 ft deep	LF	\$145	0	\$0	
42-inch Storm Sewer, 6-10 ft deep	LF	\$170	0	\$0	
42-inch Storm Sewer, 10-14 ft deep	LF	\$175	0	\$0	
48-inch Storm Sewer, 6-10 ft deep	LF	\$190	0	\$0	
48-inch Storm Sewer, 10-14 ft deep	LF	\$195	0	\$0	
54-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0	
54-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0	
60-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0	
60-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0	
72-inch Storm Sewer, 6-10 ft deep	LF	\$300	0	\$0	
72-inch Storm Sewer, 10-14 ft deep	LF	\$320	0	\$0	
78-inch Storm Sewer, 10-14 ft deep	LF	\$350	0	\$0	
Precast Manhole, 4-ft diameter, 4-10 ft deep	EA	\$2,850	4	\$11,400	
Precast Manhole, 4-ft diameter, 10-14 ft deep	EA	\$3,100	0	\$0	
Precast Manhole, 6-ft diameter, 4-10 ft deep	EA	\$4,000	1	\$4,000	
Precast Manhole, 6-ft diameter, 10-14 ft deep	EA	\$4,950	0	\$0	
Structure Cleaning	EA	\$150	0	\$0	
Outfall Repair or Replace	EA	\$2,000	3	\$6,000	
Storm Sewer Inlet Repair or Replace	EA	\$2,000	0	\$0	
Pavement Patching	SY	\$45	0	\$0	
Roadway Resurfacing	LF	\$220	120	\$26,400	
Roadway Reconstruction	LF	\$1,000	0	\$0	
Seeding and Surface Restoration	AC	\$3,000	0	\$0	
Roadway Ditch	LF	\$0	0	\$0	
Driveway Culvert Replacement	EA	\$2,000	0	\$0	
Above Ground Stormwater Storage Facility	AC-FT	\$200,000	6	\$1,200,000	
Underground Stormwater Storage Facility	AC-FT	\$500,000	0	\$0	
Stormwater Storage Facility Retrofit	EA	\$12,000	0	\$0	
Tideflex Check Valve	EA	\$10,000	0	\$0	
Wetland Mitigation	AC	\$175,000	0	\$0	
Small Channel Maintenance (brush/debris removal)	LF	\$5	0	\$0	
Large Channel Maintenance (debris removal, dredging)	LF	\$100	0	\$0	
Streambank Stabilization	LF	\$200	0	\$0	
Easement Purchasing	Each	\$100,000	0	\$0	
Property Purchasing	Each	\$500,000	8	\$4,000,000	
SUBTOTAL CONSTRUCTION COST				\$5,289,700	
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$1,057,940	
Contingency (Water Quality Requirements) (10%)				\$528,970	
Design and Construction Engineering (15%)				\$793,455	
TOTAL ESTIMATED COST				\$7,670,065	
GENERAL IMPROVEMENT COST					
Rural Road Updating to Urban Roadways	LF	\$500	5,500	\$2,750,000	
New Storm Sewer	LF	\$90	2,500	\$225,000	
SUBTOTAL CONSTRUCTION COST				\$2,975,000	
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$595,000	
Contingency (Water Quality Requirements) (10%)				\$297,500	
Design and Construction Engineering (15%)				\$446,250	
TOTAL ESTIMATED COST				\$4,313,750	
TOTAL CONSTRUCTION COST				\$11,983,815	

Tables A1.10 & A1.10.1

Conceptual Engineer's Estimated Opinion of Probable Construction Cost

St. Joseph Creek South Watershed

Sub Watershed J

STORMWATER PROJECTS COST				
ITEM	Unit	Unit Cost	Quantity	Cost
12-inch Storm Sewer	LF	\$90	815	\$73,350
15-inch Storm Sewer	LF	\$100	0	\$0
18-inch Storm Sewer	LF	\$110	80	\$8,800
24-inch Storm Sewer	LF	\$120	0	\$0
27-inch Storm Sewer	LF	\$125	420	\$52,500
30-inch Storm Sewer, 6-10 ft deep	LF	\$125	0	\$0
30-inch Storm Sewer, 10-14 ft deep	LF	\$130	0	\$0
36-inch Storm Sewer, 6-10 ft deep	LF	\$140	0	\$0
36-inch Storm Sewer, 10-14 ft deep	LF	\$145	0	\$0
42-inch Storm Sewer, 6-10 ft deep	LF	\$170	715	\$121,550
42-inch Storm Sewer, 10-14 ft deep	LF	\$175	2,000	\$350,000
48-inch Storm Sewer, 6-10 ft deep	LF	\$190	0	\$0
48-inch Storm Sewer, 10-14 ft deep	LF	\$195	0	\$0
54-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
54-inch Storm Sewer, 10-14 ft deep	LF	\$210	0	\$0
60-inch Storm Sewer, 6-10 ft deep	LF	\$200	0	\$0
60-inch Storm Sewer, 10-14 ft deep	LF	\$210	1,300	\$273,000
72-inch Storm Sewer, 6-10 ft deep	LF	\$300	0	\$0
72-inch Storm Sewer, 10-14 ft deep	LF	\$320	0	\$0
78-inch Storm Sewer, 10-14 ft deep	LF	\$350	2,950	\$1,032,500
Precast Manhole, 4-ft diameter, 4-10 ft deep	EA	\$2,850	25	\$71,250
Precast Manhole, 4-ft diameter, 10-14 ft deep	EA	\$3,100	0	\$0
Precast Manhole, 6-ft diameter, 4-10 ft deep	EA	\$4,000	0	\$0
Precast Manhole, 6-ft diameter, 10-14 ft deep	EA	\$4,950	70	\$346,500
Structure Cleaning	EA	\$150	0	\$0
Outfall Repair or Replace	EA	\$2,000	1	\$2,000
Storm Sewer Inlet Repair or Replace	EA	\$2,000	0	\$0
Pavement Patching	SY	\$45	0	\$0
Roadway Resurfacing	LF	\$220	370	\$81,400
Roadway Reconstruction	LF	\$1,000	4,100	\$4,100,000
Seeding and Surface Restoration	AC	\$3,000	0	\$0
Roadway Ditch	LF	\$0	0	\$0
Driveway Culvert Replacement	EA	\$2,000	0	\$0
Above Ground Stormwater Storage Facility	AC-FT	\$200,000	0	\$0
Underground Stormwater Storage Facility	AC-FT	\$500,000	0	\$0
Stormwater Storage Facility Retrofit	EA	\$12,000	0	\$0
Tideflex Check Valve	EA	\$10,000	0	\$0
Wetland Mitigation	AC	\$175,000	1	\$175,000
Small Channel Maintenance (brush/debris removal)	LF	\$5	0	\$0
Large Channel Maintenance (debris removal, dredging)	LF	\$100	0	\$0
Streambank Stabilization	LF	\$200	0	\$0
Easement Purchasing	Each	\$100,000	0	\$0
Property Purchasing	Each	\$500,000	0	\$0
SUBTOTAL CONSTRUCTION COST				\$6,687,850
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$1,337,570
Contingency (Water Quality Requirements) (10%)				\$668,785
Design and Construction Engineering (15%)				\$1,003,178
TOTAL ESTIMATED COST				\$9,697,383
GENERAL IMPROVEMENT COST				
Rural Road Updating to Urban Roadways	LF	\$500	8,200	\$4,100,000
New Storm Sewer	LF	\$90	1,700	\$153,000
SUBTOTAL CONSTRUCTION COST				\$4,253,000
Contingency (Mobilization, Maintenance of Traffic, Ect.) (20%)				\$850,600
Contingency (Water Quality Requirements) (10%)				\$425,300
Design and Construction Engineering (15%)				\$637,950
TOTAL ESTIMATED COST				\$6,166,850
TOTAL CONSTRUCTION COST				\$15,864,233

Tables A1.11 & A1.11.1