

Spring Creek Watershed Assessment

Introduction

Material presented in the following summary documents current stormwater management and flooding issues for the Spring Creek Watershed. Information presented is based on a review of available information related to current conditions in the drainage basin. No comprehensive analysis of stormwater management and flooding issues in the watershed has been performed in the last 20 years.

Watershed Description

Description and Land Use

The Spring Creek watershed is located in the northern part of the City of Rockford on the east side of the Rock River. The watershed drains approximately 3,545 acres at its mouth. Roughly 58% of the watershed is located within the City of Rockford. The remaining 42% of the watershed extends into the Village of Loves Park and unincorporated Winnebago and Boone Counties. The watershed is long and narrow, with the stream entering the Rock River just north of the commercial center of the City.

Watershed Statistics: Spring Creek	
Total Area:	3,545 ac.
Total Area within City:	2,058 ac.
% of City within Watershed:	5.2%
Other Stakeholders:	Loves Park
No. of Detention Facilities	30
No. of Outfalls	15

The Spring Creek watershed is about 70% developed. The majority of the current development has occurred in the south and central portions of the watershed. Though predominantly residential, the Spring Creek watershed also contains commercial developments and agricultural land, as well Rock Valley College and two high schools. Many homes within the watershed have been built adjacent to the creek so that it serves as a focal point for their lawns and yards. The City anticipates that development will extend to the relatively undeveloped northeastern corner of the watershed area within the City limits in the coming years.

Topography and Soils

The topography of the Spring Creek watershed is typical of the long, narrow watersheds within the eastern part of the City of Rockford. Ground elevations within the watershed range from about 900 feet NAVD near the Winnebago-Boone County Line, to about 700 feet NAVD near the creek's confluence with the Rock River. Variations in elevation across the watershed

(perpendicular to the stream) range from 875 feet in the relatively flat upper areas east of Mulford Road to 750 feet in the well-defined valley sections to the west.

Soils within the Spring Creek watershed consist primarily of type B soils, with thin pockets of type D soils surrounding the creek bed. Type B soils are soils with moderately low runoff potential when thoroughly wet. Water can be transmitted through these soils without impediment. Type B soils typically have less than 20 percent clay, and between 50 and 90 percent sand with a loamy sand or sandy loam textures. These soils have moderately fine to moderately coarse textures. Type D soils are characterized by properties that restrict water movement through the soil. Type D soils typically have greater than 40 percent clay, less than 50 percent sand, and have clayey textures. They have high runoff potential when thoroughly wet.¹ The predominance of type B soils in the Spring Creek watershed should facilitate infiltration of rainfall in pervious areas, thereby contributing to lower runoff volumes and rates than in basins with less pervious soil types.

Primary Receiving Stream

Spring Creek is the primary receiving stream for the Spring Creek watershed. The creek is approximately 25,500 feet (4.8 mi.) long and exists in essentially a natural state with certain areas having been reinforced with concrete bank walls and riprap bank stabilization to minimize erosion. Spring Creek has a stream bed elevation of 698 feet (NAVD) at its mouth, and 853 feet (NAVD) at its origin. The creek is relatively steep, with an average fall of 30 feet per mile. The profile of the stream is shown in the Flood Profile extracted from the 2006 Flood Insurance Study for Winnebago County and Incorporated Areas.

Spring Lake is the only significant on-stream impoundment of Spring Creek within the watershed. Spring Lake is an organizationally owned impoundment located west of Mulford Road. It is an on line regional detention facility operated by the Spring Lake Subdivision and is not open to the public.

The 1981 Corps of Engineers Study of the Rock River area references two USGS gauging stations in the Spring Creek watershed. The purpose of these stations was reported to be to monitor flow, water quality and sedimentation in Spring Creek at McFarland Road and downstream of Rock Valley College. However, a current search of USGS gauging stations shows no reference to either of these sites. As such, it is assumed that neither remains in operation.

¹ Burke, Christopher and Thomas Burke. HERPICC Stormwater Drainage Manual. West Lafayette, Indiana: Purdue Research Foundation, 1994.

Readily available flow data for the Spring Creek watershed is presently limited to calculated flood flows published in the Flood Insurance Study for Winnebago County and Incorporated Areas are summarized in Table SC-1 below. It is important to note that these flows are based on analyses performed more than 30 years ago and likely do not reflect current conditions in the watershed.

**Table SC-1
 FLOOD INSURANCE STUDY FLOWS (1976)
 SPRING CREEK WATERSHED, ROCKFORD, ILLINOIS**

Cross Section Location	50-year Flow		100-year Flow	
	Flow (cfs)	Flow (cfs/acre)	Flow (cfs)	Flow (cfs/acre)
At confluence w/ Rock River	1,300	0.308	1,560	0.369
Above Spring Creek Road	1,160	0.378	1,390	0.453

Source: Flood Insurance Study, Winnebago County and Incorporated Areas, Federal Emergency Management Agency. 2006. Flows based on 1976 analysis.

Given the character of the watershed, flooding within Spring Creek is of a flashy nature. Localized flooding along the creek is aggravated by the number of small bridges, vegetative debris and trees along the stream channel. As shown in Figure SC-1, the floodplain along Spring Creek is relatively narrow over most of the length of the stream. Areas where the mapped floodplain appears to include developed properties include:

- Fireside Rd
- McFarland

Records maintained by the Federal Emergency Management Agency (FEMA), indicate that no letters of map revision (LOMRs) have been issued for development projects in the Spring Creek watershed during the past 30 years.

Water Quality and NPDES Discharges

Spring Creek is a clear, spring-fed stream. The waters are generally cool and clear with thriving aquatic life. Sedimentation has occurred in certain portions of the creek, mostly near McFarland Road, indicating that the stream is susceptible to impacts resulting from erosion of upstream agricultural lands. Water quality in Spring Lake is subject to degradation resulting from animal

activity and sedimentation. A future dredging project is planned to address issues at Spring Lake (see Drainage Issues Matrix).

Within the Spring Creek watershed one site has been monitored under the SCORE sampling program. This site, T5, is located at Spring Creek at Starkweather Ave., and is the location of full water quality analyses and bioassessment (macroinvertebrate). Table SC-2 provides metadata for the sampling site. Figure SC-3 shows the location of the sampling site.

Figure SC-3
WATER QUALITY SAMPLING SITES
SPRING CREEK WATERSHED, ROCKFORD, ILLINOIS

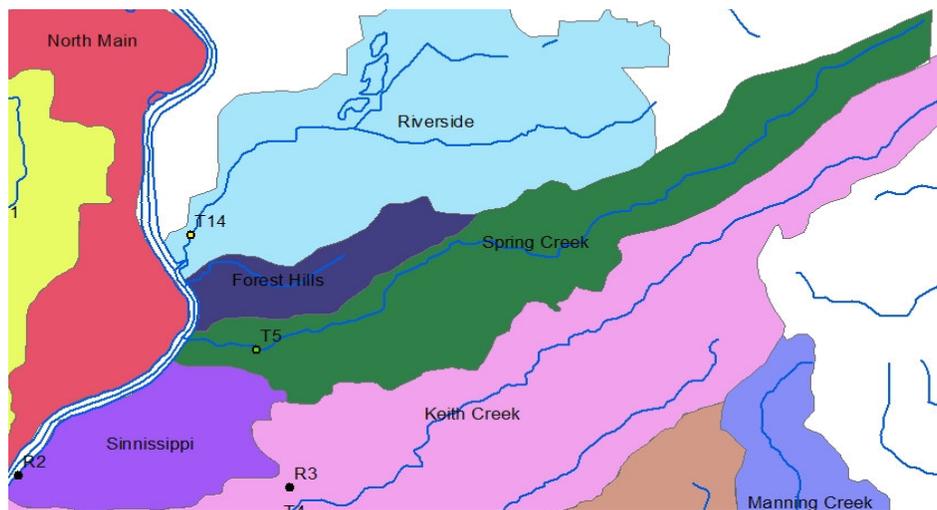


Table SC-2
SAMPLING SITES
SPRING CREEK WATERSHED, ROCKFORD, ILLINOIS

Station	Location	Station Type	Number of Samples (2003-2008)	Parameters Measured
T5	Starkweather Ave.	Full water quality analyses & bioassessment	44	DO, pH, Temp, Conductivity, Fecal Coliform, BOD, COD, TSS, TDS, Hardness, Ammonia-N, Nitrate-N, P, Discharge

Field measures at T5 show that Spring Creek is in compliance with General Use Water Quality Standards for DO, pH, TSS, and TDS. Nutrient concentrations are similar to the other MS4 tributaries for ammonia N and total phosphorus. Nitrate N concentrations are significantly lower than concentrations found in North and South Kent Creek (T1 and T2) and are similar to the concentrations found in Keith Creek (T3 and T4).

Physical habitat, as measured by SHAP, was highest at T5 indicating higher quality habitat. The benthic community, however, at this site appears to be similar to the communities found within the other MS4 tributaries indicating that other factors other than habitat may be influencing the benthic community within this watershed.

Figure 6 is a fecal coliform load duration curve for Spring Creek, T5². Coliform levels were monitored on 19 occasions; on all but six sampling events, the water quality standard was exceeded. While additional data are desirable for the site, the bacteria standard is clearly exceeded regularly during high flows, as well as during other hydrologic conditions. The median fecal coliform concentration at T5 is higher than the median concentration found in T1 and T2, North Kent Creek and South Kent Creek. Again, North Kent Creek and South Kent Creek were placed on the Illinois impaired waters list for fecal coliform in 2006. Near T5, field visits have noted that streamside residents feed waterfowl. These birds may be responsible for much of the bacterial load, especially during low flow and dry weather conditions.

² Streamflow measurements have been made along with the sample collections since October 2005. From this data, a load duration curve was prepared for Keith Creek. Flow data from Piscasaw Creek near Walworth, WI was used for the target load duration curve for T5.

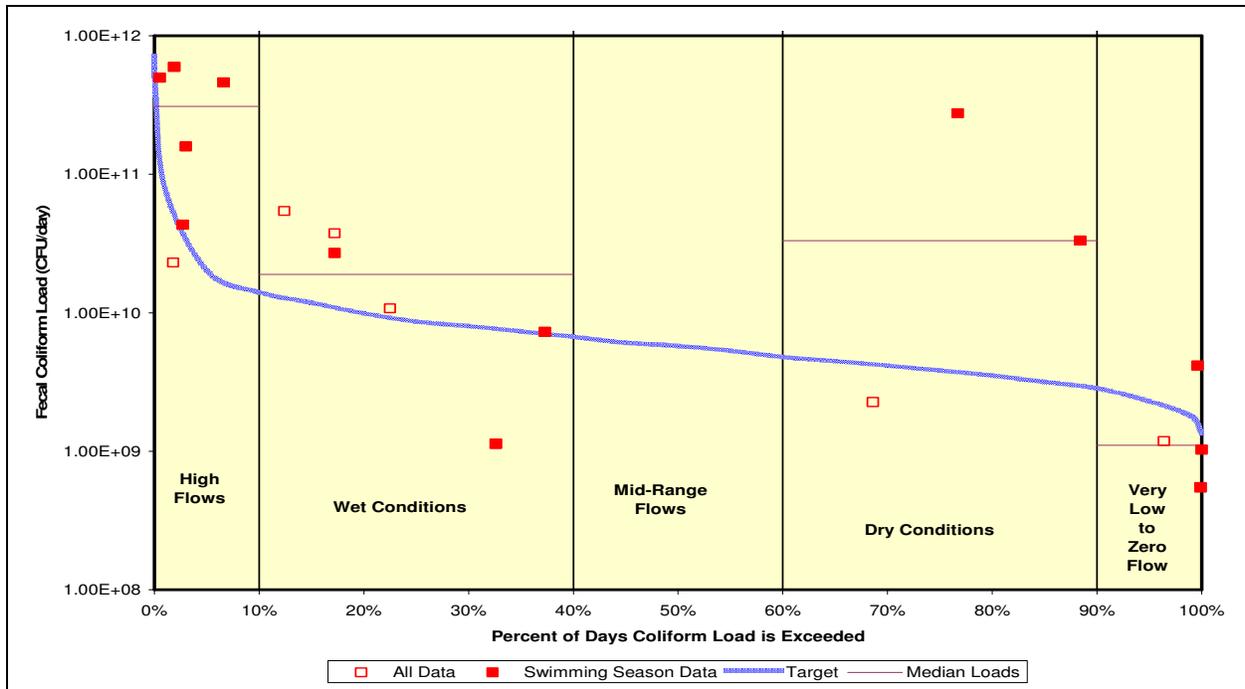


Figure SC-4. Fecal Coliform Bacteria Load Duration Curve, Site T5, Spring Creek, 2005-2007

Table SC-3 provides the NPDES-permitted point sources in the watershed.

**Table SC-3
 NPDES POINT SOURCES LOCATED WITHIN THE SPRING CREEK WATERSHED
 ROCKFORD, ILLINOIS**

NPDES Permit #	Facility Name	Receiving Water
IL0066729	Eisenhower Middle School	Spring Creek (to Rock River)
ILR400118	Rockford Township of	Not listed
ILR10H753	Guilford Crossing	Not listed
ILR10H716	College Center	Not listed
IL0067229	Allen Barry Livestock-Leaf Rvr.	Not listed

Runoff from industrial sites is a potential pollutant source for receiving waters. Table SC-4 lists the industrial sites within the Spring Creek watershed.

**Table SC-4
 INDUSTRIAL SITES LOCATED WITHIN THE SPRING CREEK WATERSHED
 ROCKFORD, ILLINOIS**

Name	Street	Land Use Code (LUC)	LUC Description
Anderson Gardens	Spring Creek Rd.	7000	Miscellaneous Services
Perryville Square	Perryville Rd.	5814	Fast Food/Short Order Restaurants
Rock Valley College	Mulford Rd.	8210	Educational Facilities – w/o Sp, FC.
YMCA of Rock River Valley	Orth Rd.	7991	Rcrtn. – Amsnt. Social- Rlgs. w/S-Fac.

Existing Drainage Network

Drainage within the Spring Creek watershed occurs through a mix of surface drainage paths, storm sewers, and creek channels. In the less developed northeastern part of the watershed, surface drainage is the primary mode of stormwater conveyance. The southwestern and central portions of the Spring Creek watershed are drained by extensive networks of storm sewers as shown in Figure SC-1. A secondary channel in this area also provides drainage through backyard swales and an underdrain system located between Jonquil Place and Brookview Road. These differences in drainage mechanisms are analogous with the respective development in these sections of the watershed.

Figure SC-2 also shows the general location of identified detention basins and storm sewer outfalls within the Spring Creek watershed. The Spring Creek watershed has 30 identified detention facilities including the regional Spring Lake impoundment. These facilities are distributed through the central and northeastern part of the watershed. The 15 identified storm sewer outfalls within the watershed are located generally west of Mulford Road with the largest number concentrated in the area between Alpine and Mulford Roads, along the Jonquil Road Drainage Ditch.

Available Data Resources

Previous Drainage Studies

A review of available data identified no recent, comprehensive studies of drainage issues within the Spring Creek watershed. Previous drainage studies that included consideration of the watershed are listed below:

“A Master Drainage Plan for the Rockford Regional Area: Rockford-Winnebago County Regional Drainage Plan and Study.” Espey, Huston & Associates, Inc. November 1981.

“Rock River, Rockford & Vicinity Final Report Technical Appendices.” US Army Corps of Engineers: Rock Island District. April 1981.

“City of Rockford Comprehensive Storm Drainage Plan and Report.” Warren & Van Praag, Inc. November 1955.

Historic Flow Data

No source of historic flow data has been identified for the Spring Creek watershed.

Historic Water Quality Data

No source of historic water quality data has been identified for the Spring Creek watershed. (pending input from David Pott)

Other

Floodplain and Floodway:

Flood Insurance Study: Winnebago County and Incorporated Areas, (FEMA, 2006)

Soil Characteristics:

“Soil Survey Geographic (SSURGO) database for Winnebago County, Illinois.”

Fort Worth: U.S. Department of Agriculture, Natural Resources Conservation Service, 2007.

[URL:<http://SoilDataMart.nrcs.usda.gov/>](http://SoilDataMart.nrcs.usda.gov/)

Drainage Issues

Table SC-5 (on the following page) provides a summary listing of current identified drainage issues and projects within the Spring Creek watershed. The general locations of these issues and projects are shown on Figure SC-1.

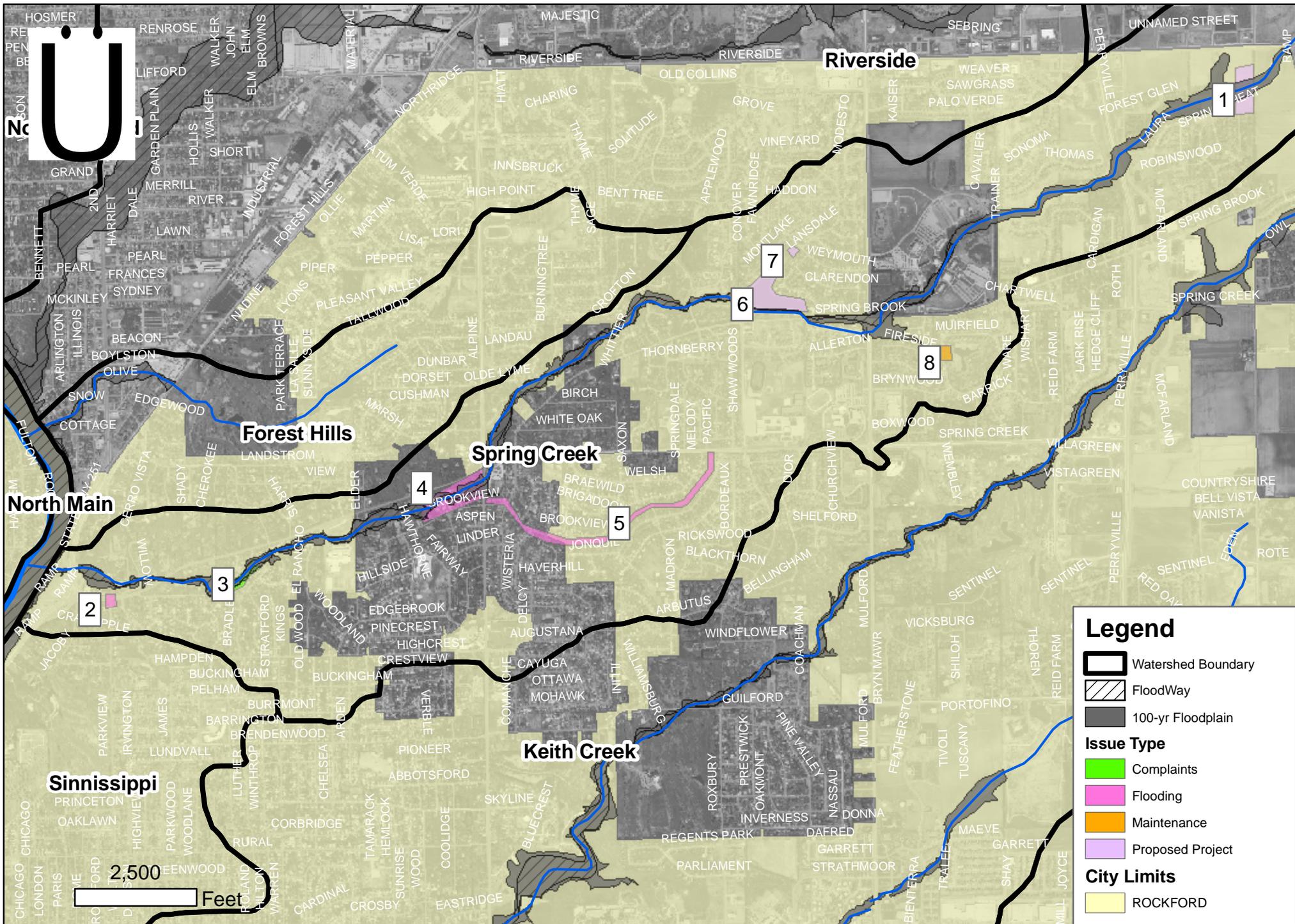
The most significant stormwater management/flood control problem in the Spring Creek Watershed seems to be the localized flooding of creek-side residences and creek erosion of private properties. With the opportunity for increased residential development upstream along the Creek, the City should be proactive in its efforts to preclude future development activities that would contribute to further flooding or property loss along the creek. The Ryebrook development provides a near-term opportunity for consideration of measures to reduce

stormwater runoff impacts and/or flooding vulnerability. It is imperative that residential and other vulnerable development not occur within the floodway or floodplain areas. Where construction within a floodplain is warranted, appropriate compensatory storage must be provided. Consistent application of these principles will reduce the potential for future increases in flooding and flood-related damages, and the need for costly flood control projects.

The City also receives backyard flooding complaints from the Spring Creek watershed in response to major storm events and responds to the best of their ability. Further evaluation of site-specific stormwater management/flood control improvement needs is required to provide a basis for effective planning, budgeting, and prioritization of potential projects.

Table SC-5
SUMMARY OF STORMWATER/FLOOD CONTROL ISSUES AND PROJECTS
SPRING CREEK WATERSHED, ROCKFORD, ILLINOIS
 Spring Creek Watershed

#	Brief Description of Issue	Issue Type				Action			
		Overbank Flooding	Major Surface Flooding	Localized/Nuisance Flooding	Water Quality Impacts	Improvements Completed	Maintenance Required	Future Project	Proposed Project
1	Ryebrook Street - Future development							•	
2	Parkview Avenue and Spring Creek Road - Localized flooding			•					
3	Camella Court - Streambank stabilization needed. This area is included as part of the Neighborhood Plan.						•		
4	SW of Spring Creek Road and Alpine Road - Residents experience backyard flooding.		•						
5	SE of Spring Creek Road and Alpine Road - Residents experience backyard flooding.		•						
6	SW of Weymouth and Spring Lake Drives - Pond has been identified as having a high fecal coliform count.				•				
7	NW of Weymouth and Spring Lake Drives - Dredging of the channel and the installation of a trash rack at the pond's outlet.						•		•
8	S of Muirfield Land and Fireside Drive						•		



Spring Creek Watershed Flooding Issues

City of Rockford, Illinois
Autumn 2008



Figure SC - 1