



Chapter 2 - Rochester's Water History

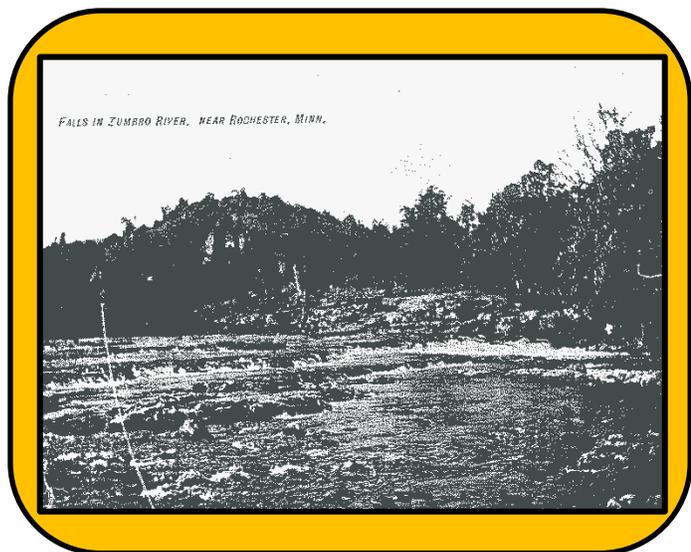
The City of Rochester's history is intertwined with that of water. Limited archeological and historical evidence records the presence of Native Americans along the banks of the Zumbro River before Rochester became a City. After the Treaty of Traverse des Sioux was signed in 1851, white settlers began moving here, as well. Minnesota became a territory on March 3, 1849. Five year later, John Head and his two sons, George and Jonathan, built a log house on the west shore of the Zumbro River near 4th Street SE. Rochester was official founded by George Head in 1854, although incorporation as a City with a formal government, would not occur until 1858. Head named the new settlement Rochester because the waterfalls in the river reminded him of his native Rochester, New York. Some early sources refer to the water feature as the "Falls of Wasioja"; others sources note it as the "Falls of Wazionja". The waterfalls were located close to what is now 4th Street SE.

The history behind the river name Zumbro is a bit of a mystery as well. The Minnesota Territory was part of President Jefferson's Louisiana Purchase from France that greatly expanded the boundaries of the United States in 1803. An early map, dated 1805 -1806, by famous cartographer Zebulon M. Pike, called the river "Riviere des embarrass". When this name is said out loud in the French dialect, it might sound a lot like "Riveer dezembra" to English speaking ears, which then became Zumbro. Riviere des embarrass means "river of difficulties" as it had many snags and dead trees at the mouth on the Mississippi so it was never a great river for

hauling supplies or furs in canoes during the fur trade era. Another map, dated 1836 by Major Stephen H. Long and Lieutenant Albert M. Lea, called the river "Embarrass". Joseph Nicolas Nicollet and his team were commissioned to map the upper regions of the Mississippi River. On their 1843 map, the river where the Head family built their home in Rochester is labeled as "Wazi Oju", meaning "place of pines", as it was called by members of the Dacotah Nation. (Today, the town of Wasioja is on the Middle Fork of the Zumbro River, northwest of Rochester.)

A July 21, 1854 plat from the

United States Surveyor General's Office uses the name "Embarrassa River". J.A. Leonard, in Last History of Olmsted County (1910), referred to the fact that newcomers in the Rochester area had difficulty with the pronunciations of local geographical names. Documents seem to support the metamorphosis of the name through the slurring of language. An 1856 map by J.H. Young uses the name "Zumbrea" for the river. A September 14, 1858 document refers to County Commissioners of Wabasha County building a



Source: History Center of Olmsted County



bridge over the “Zumbro River”. Another suggestion about the origin of the river’s name is that it may have been related to a French-Canadian explorer, Edward Zumbro, who travelled through the area in the latter part of the 18th century, although documentation is lacking.

The Zumbro River has been a part of life in Rochester since the City’s founding. In 1856, gold was discovered in the Zumbro from Rochester to Oronoco and further down river. On February 7, 1858, the First Baptist Church, Rochester’s first house of worship, held its first baptismal service in the Zumbro River. Holes had to be chopped through the ice to allow for the believer’s immersion into the cold water. Ice harvesting on the river during the winter provided

ice for the people of Rochester during the summer months. George Head built another cabin on the river that would turn into Rochester’s first hotel. After a tornado ripped through Rochester in 1883, new concerns for safety arose within the community. A system that provided safe drinking water and could be used for putting out fires was needed and built.

Rochester Daily Bulletin

Thursday January 7, 1915

THE ICE HARVEST IS BEING GATHERED IN ROCHESTER

No Need For Worry in 1915

The ice harvest in Rochester has started in earnest. The Zumbro river below Fifth street bridge has been attacked by the icemen in regular formations and on all sides the ice king has been flanked. One portion is being utilized by George DeWitt while the State hospital has a crew of employes busy gathering the season's harvest. The ice is of a good quality and escaped injury at the hands of the warm weather which the country experienced during the past two days.

Just as soon as occasion permits, Mr. DeWitt will start another crew of men on the upper Zumbro, south of Rommel's Dam and efforts will then be directed toward filling the new ice house recently completed by Mr. DeWitt. With the interior of the big ice houses taxed to their capacity and the distribution of manufactured ice by The Rochester Artificial Ice Company there is no need for worry over the ice crop supply during the hot days of nineteen hundred and fifteen.

Source: History Center of Olmsted County – Original Source: Rochester Daily Bulletin

Water Supply

The issue of a private versus a public water supply system was the center of much debate, petition, and apparent fraud. Finally in 1887, the City decided to contract with the firm Hodgkins, Moffet, and Clark from Waterville, New York to operate a water system. It was a franchise contract with a 30 year lease,



whereby Rochester would rent the water structures, but the water itself would be free. Rochester was charged \$3,900 per year for the water system that included 120 hydrants for fire protection and 8 miles of water main. A standpipe that held 225,000 gallons of water was built in 1887 on College Hill, where St. Mary's Park is currently located. The standpipe remained in service until it was taken down in 1995, 108 years after it was built! Pumps to distribute the water and other operations were in a "Water Works" building that was located where Bear Creek joined the Zumbro River, close to where the Mayo Civic Center is now located. The water company had difficulty turning a profit, however, and declared bankruptcy in March of 1896. Burt W. Eaton, the Rochester City Clerk, was appointed president to run the company while new buyers were being sought. At that time, the company name was changed to the Rochester Water Company. Money was tight. The system was aging and floods in 1903 and 1908 caused damage. Financial matters stabilized enough in 1910 for the company to drill its first Rochester well into the Jordan sandstone. When the City's lease with the company ended in 1916, the City decided to purchase the company instead of renting the water structures, thus forming the Public Utilities Water Department. Funds for the purchase needed voter approval, however, and the bond issue for \$175,000 passed on May 25, 1916, by a vote of 612 to 17. The first municipal system included 1,700 customers, 17.5 miles of main with hydrants, and the Water Works (pumping station, wells, workshop, and a bay horse named, Dick.) Part of the bond, \$50,000, was set aside for needed improvements. The "Saint Mary's" water tower was constructed in 1924 and was functional until 2000. It is now being preserved as a historic landmark. (See Chapter 5 – Rochester's Water Supply, for information on the City's current system.)

Hydroelectric Generating Plant

As the village grew into a town and then a city, so did the population's needs. To decrease their dependence on burning coal for electricity, the citizens of Rochester voted to construct a municipal electrical power dam 12 miles upstream at the cost of about a million dollars. The contract to build the dam was signed on April 6, 1917, the same day that the United States declared war with Germany (World War I). Hugh Lincoln Cooper was hired to design and oversee the construction of the dam. Cooper later earned worldwide recognition for his engineering of dam structures. The Toronto Power Plant at Niagara Falls was designed by Cooper and he was the first foreigner to be awarded the Order of

Homes Powered by the Lake Zumbro Hydroelectric Generating Plant:

- 2012 = 7,549 MWH
 - 968 homes (lowest water year since 1989)
- 2011 = 15,797 MWH
 - 2,025 homes
- 2010 = 13,241 MWH
 - 1,698 homes

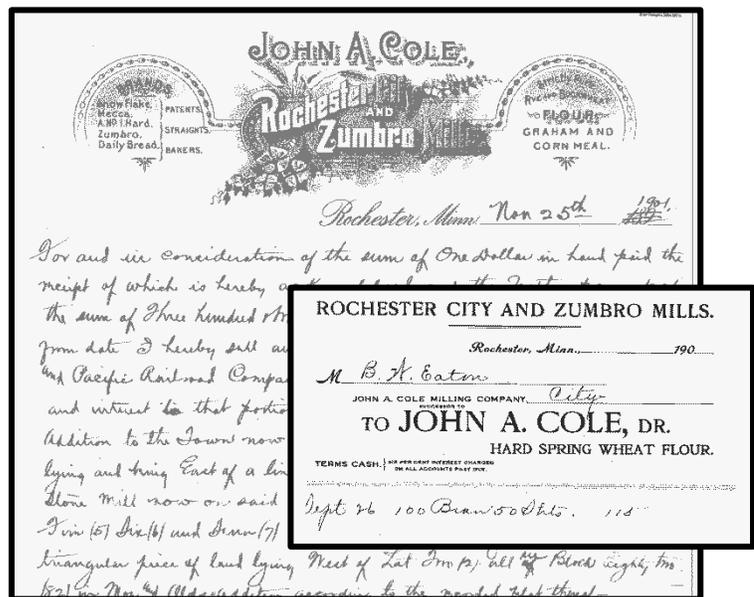
NOTE: Each home uses about 7.8 megawatts per hour of electricity produced by renewable water energy.



the Red Star, the highest honor given by the Soviet government. The Lake Zumbro Hydroelectric Generating Plant began operation on November 7, 1919 to supply the electrical needs of the growing City. It could only operate cost-effectively during the spring months when water levels were the highest. The system is still owned and operated by Rochester Public Utilizes and water levels still affect the amount of electricity produced by the plant.

Industrial Mills

The rapid drop in elevation at the Falls of Wasioja attracted the attention of mill owners. Throughout the 1950's an assortment of flour mills dotted the banks of the Zumbro in Rochester. Rochester Milling Company was Rochester's oldest industry, having been opened by Mr. F. A. Olds in 1854. It produced 250 barrels of flour a day and was located on 3rd Street by the Zumbro River. The Rochester City and Zumbro Mill (Cole's flour mill) operated at 7th Street NE, near today's location of the Silver Lake Fire Station. Tondro Mills was built in 1863 on Cascade Creek. Canals or "mill runs" or "mill races" were created to direct water from the rivers to the mill foundations, where the current would turn large wheels that would then turn the milling stones to grind flour. At one time, there were four mill runs in Rochester, with the largest running near Broadway Avenue. Electrical power gradually replaced the need for running water and the mill runs were filled with dirt.



Source: History Center of Olmsted County

Milling was not limited to just flour. The first saw mill in Rochester was owned by Joseph Alexander and produced 500 foot-boards of lumber per day. In 1857, the Steam Millwork and Sash Factory open on the east side of the Zumbro River.

Just as the former mills depended on water flowing from higher elevations to lower elevations, the delivery of sanitary sewage to today's water treatment plant also relies on the topography of Rochester's river valleys again. Sanitary sewers also use gravity to do the work (see Chapter 6 – Rochester's Wastewater Treatment System).



Rochester Post Bulletin Friday June 7, 1929

Old Mill Race is Filled Up

Part of that which made Rochester in the beginning has begun to disappear, the old mill race, north of Fourth Street SE. Workmen this week began filling the trench which for many years carried water for power to operate the flour mill. This is part of the program of development now under way in that vicinity, including the laying out of a public alley between Fourth and Third streets.

Dirt from the alley excavation is being dumped into the mill race and it is the ultimate intention to close it entirely so as to add land to the holding of the milling company.

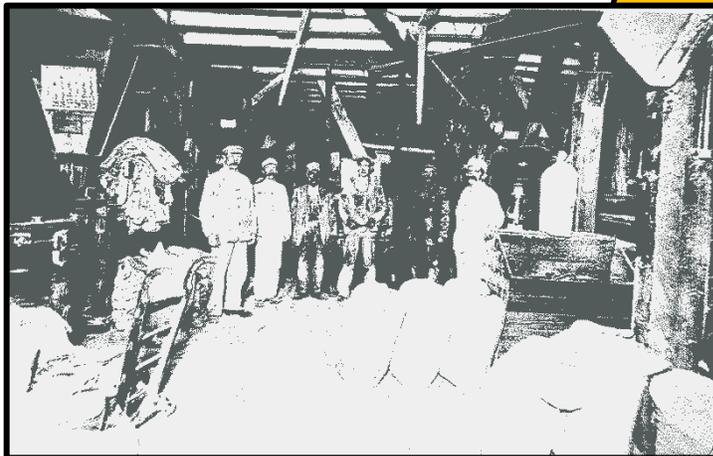
This land and the old private roadway, which led to the mill and which served as a semi-public road during the entire history of Rochester, may be later used for a parking space, Spencer Knapp of the milling company, has intimated.

The Falls of Wasioja at the bridge caused Rochester to be established because it showed that there was water power here. The mill was built because of the power. The race was dug so as to provide a flowage of water for the turning of the old mill wheels.

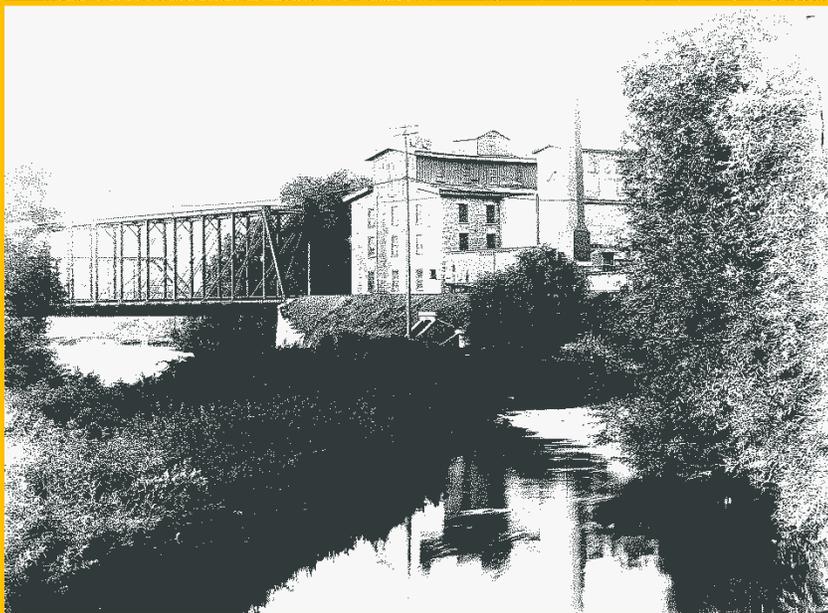
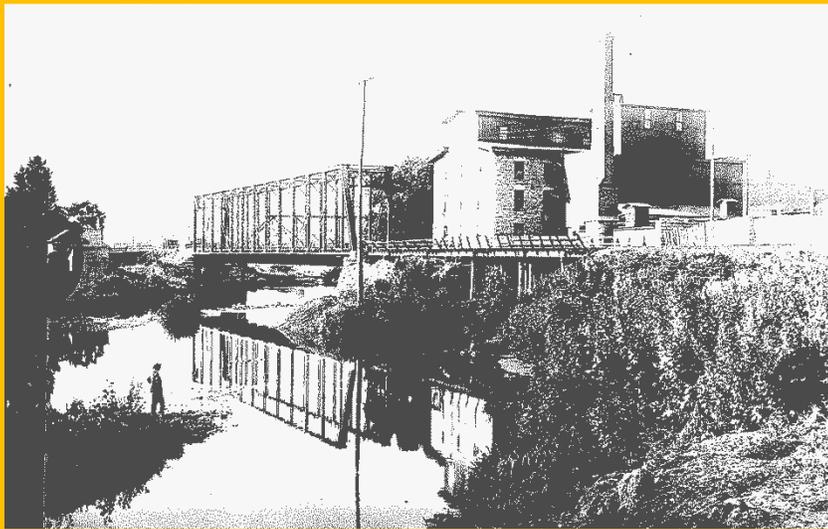
Today the mill is operated by electricity. The water power has not been needed for a long time. The mill race is being abandoned and obliterated.

Source: History Center of Olmsted County

Rochester Milling Company



Source: History Center of Olmsted County



1880 - MILLS: Zumbro Flouring Mill



STONE BRIDGE ON THE ZUMBRO RIVER ROCHESTER, MINN.

The two photos on the top left are of the Rochester Milling Company (Olds and Fishback) Mill. The others are the Rochester and Zumbro (Cole) Mill. The stone bridge was the foundation of the Cole Mill. Find the Zumbro River, the mill run and the railroad bridge.

Source: History Center of Olmsted County (All)



As the land uses changed, the Highway Department was called upon to straighten the river channel and improve Highway 63 (also known as Broadway Avenue). Two mill dams within the Zumbro, Rommel and Strawberry, were removed and the channel of the Zumbro was straightened. The riverbed along Highway 63 was also blasted to add depth and, in doing so, the original Wasioja Falls of Rochester were destroyed. The Highway 63/Broadway Avenue bridge over the Zumbro River was dedicated in 1932.

Recreation/Dams

In addition to its industrial uses, the river was also important for recreation. While many people would travel north of Rochester to Lake Shady and Cedar Beach on Lake Zumbro to cool off during the summer months, the residents of Rochester wanted a nearby City park on the river. Mayo Park, formed in 1904 where the Civic Center stands today, was the City's first park along the Zumbro River. Later, an architect, Hugh Vincent Feehan, was hired by the City to design another park with an artificial lake that came to be known as Silver Lake Park, which housed a municipal zoon until 1940. This lake was formed by digging a basin and installing a dam. (See Chapter 4 – Rochester's Constructed Water Bodies for more information on its construction.)

Even today, Rochester has many parks located on creeks and rivers (see the next page). Silver Lake is still part of the Zumbro River. Silver Creek runs through Quarry Hill Park. Cook and Kutzky Parks are located along Cascade Creek. Bear Creek has a park named after it. Slatterly Park is also on the banks of Bear Creek. On Sunday evenings in July and August, thousands of people enjoy "Down by the Riverside" free concerts in Mayo Park.

Canoeing the Zumbro River in Rochester

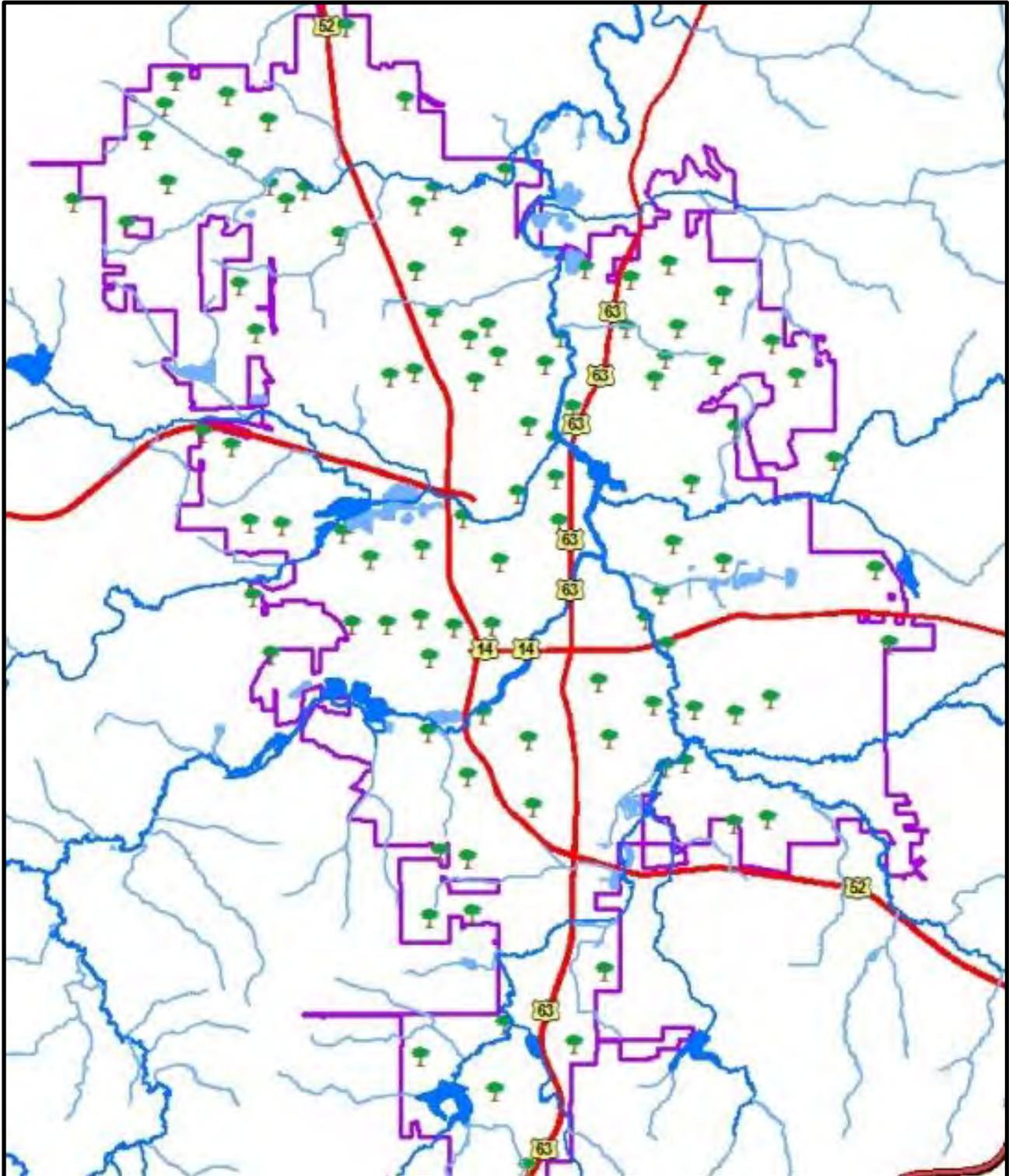


Source: Deb Las

While the Silver Lake dam is perhaps the most well-known dam in Rochester, other dams have had an important part in Rochester's water history. In 1911, Dr. Charles Mayo added a dam to his Mayowood Estate, creating Mayowood Lake. It had a tailrace to operate a generator. Twenty years later it became obstructed with silt and a new dam was needed. The second dam did not have a generator.



Rochester City Parks: How many are located along rivers?



Source: Rochester Public Works

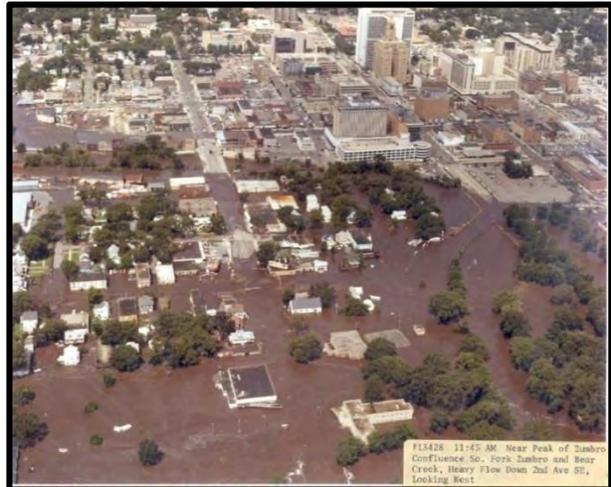
Flooding

The need for controlling the flow of water through Rochester went beyond industry and recreation, however. Controls were also installed along the rivers for flood protection. Rochester was built on the floodplain created by the South Fork of the Zumbro River and its tributaries. Since early settlers depended on water for many of their daily needs, the City's location next to the rivers seemed perfect for a growing community. But all the new construction was ignored by naturally flooding rivers. The conflict between a river's need to flood into its floodplain and people's desire to be next to water became a battle that is still fought today.

The first recorded flood in Rochester was either in 1855 or 1859 (records conflict); it destroyed bridges with its crest 15 feet above normal water levels. A prominent Rochester publisher perished in the flood waters. In August of 1866, three homes were destroyed and three families were rescued by boat. On June 23, 1882, another noted Rochester flood resulted in the loss of livestock and property. Parks were flooded and destroyed in 1908. Flooding in Rochester continued through the subsequent years. The U.S. Army Corps of Engineers, in cooperation with the City of Rochester and Olmsted County, began taking a serious look at trying to prevent flooding in Rochester in 1962, long before the historic 1978 flood.

The 1978 flood was Rochester's worst flood disaster since its founding. The rains started on July 5, 1978 and by July 6th the flood waters were rising. At the time, over one-third of the City,

Rochester's 1978 Flood





including 2,000 homes and businesses, lay in the flood plain. Evacuation of 5,000 residents, some by boat, took place during the rainy night and continued the next day. Damage was over \$58 million (\$250 million in today's economy). Five people lost their lives.

Volunteer Joins Rescue 'Navy'

Boater Helps Stranded Victims

By STEVE SCHULTZE
Post-Bulletin Staff Writer

Gordan Holmes was listening to his police scanner radio Wednesday night as Zumbro River and Bear Creek waters kept rising, forcing Rochester residents out of their homes.



A message crackled over the scanner that sent Holmes out into the stormy night. Officials handling the emergency effort needed boats. Holmes, who lives on higher ground at 521 18th St. NW, hitched his 18-foot Alumacraft boat and trailer to his car and drove down to the banks of the swollen Zumbro in southeast Rochester.

He was immediately pressed into service, assisting two city policemen to a rescue at the Tropic Bowl at 400 Fifth Ave. S.E., where five persons were stranded. Approaching the building, one of the policemen threw the boat's anchor through a window to provide an escape route. The marooned persons were then ferried to safety.

Holmes had helped with four rescues, nudging floating debris in the murky, swift waters, when his 25-horsepower outboard motor became a total casualty. He was transporting a cargo of nine near Slattery Park when the motor hit a submerged obstruction and ceased to run.

But Holmes, a Post-Bulletin circulation department employee, was not deterred.

He and his policeman comrades hopped into the waist-high water and towed the boatload of rescued persons to land.

He and the officers continued to rescue people by this means until dawn Thursday.

"Oh boy, they really worked," Holmoe said of the policemen, whose names he never had time to learn.

"We were in water most of the time up to our hips."

Holmes wasn't the only volunteer

boatman offering assistance.

"There were a lot of them there; inboards, outboards, small boats," Holmes readily responded.

Some people want to be rescued, but they don't usually reach it. Some people want to be rescued, but they don't usually reach it. Some people want to be rescued, but they don't usually reach it.

City Sewer Plant To Be Bypassed With Raw Sewage

Raw sewage will be dumped into the Zumbro River for about a month because of flood damage to the Rochester municipal sewage treatment plant, it was reported today.

Plant Supt. Marvin Skodje said he doesn't see how all repairs can be made and the plant restored to operation for at least 30 days, even if work starts now.

Skodje, who estimated damage to the plant at half-a-million dollars, said sewage will be bypassed raw into the river, but will be first heavily chlorinated.

Public health officials here said the chlorinated sewage poses no health hazard to city drinking water.

Flood waters submerged the plant,

severely damaging electrical equipment, including pumps, motors and meters, Skodje said.

Mayor Alex Smekta is expected to order immediate repairs without going through normal bidding or price quoting, a delay he can avoid through his executive emergency powers of office.

"We couldn't ask for estimates," Skodje said, "because no one could tell how much will need repair or replacement until instrument panels and such are removed."

He said, ironically, the plant is even without water today to wash down mud left by floodwaters. He said water would be trucked in to get the job done.

4 Nursing Home Deaths Confirmed As Drownings

By MARY VITCENDA
Post-Bulletin Staff Writer

The four women trapped in an elevator at Nat...
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A city inspector said the elevator automatically descends to the basement when there is a malfunction or trapped persons could have done nothing to save them, he said.

State officials who handle elevator inspection and licensing could not be reached for comment this morning. Authorities said the four were trapped about 1:15 a.m. and their bodies recovered about 6 a.m. Rochester firemen reached the four at the top of the elevator shaft, authorities said.

Nursing home employees continued their cleanup of the building today. They returned late Thursday morning to find their offices on the basement floor filled with mud. "We didn't even get to them," said Marilyn Godes, one of them, said Marilyn Godes, one of the aides.

When it started raining, the fire department went off and scared everyone, said nursing home resident Gorath. He dashed to get everybody to the second floor. The power went on and he was unable to walk, but he

Source: History Center of Olmsted County, Rochester Post Bulletin

Flood Control

The historic 1978 flood happened while a flood control bill for Rochester was waiting in Congress for approval. The flood control plan had two distinctive parts: the river project by the U.S. Army Corps of Engineers (the Corps) and the reservoir project by the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), formerly the Soil Conservation Service. Congress approved the NRCS



project in 1983 and it was completed in 1996. The Corps project was approved in 1986 by Congress and it was completed in 1995. The plan was for six NRCS flood reservoirs plus one flood reservoir that would also become a recreational area (Chester Lake). The Corps was to widen and deepen the river channel to add more water capacity in and improve flows through the City. The flood control project cost \$114 million dollars: \$96 million for the Corps portion and \$18 million for the NRCS part. The City was responsible for 25% of the Corps project cost (\$24 million) and 92.8% of the NRCS costs (\$16.704 million), for a total City bill of \$40.704 million. The funds were raised through a voter-approved, 1% addition to the local sale tax that was collected between 1983 and 1992.

The flood control project used a multiple faceted approach that combined water storage in reservoirs located in the upper portions of the watershed, stream bank stabilization, channel improvements, and levees. Together, these structures control the amount of water moving through the City and the rate it is discharged. The engineered design protects most of the flood prone lands within the flood control project area from significant flooding, up to a 220 year storm event (that is, a large rainfall event whose probability that it will occur is once every 220 years). Basically, that means that the flood risk has been lowered to less than 0.5% in any given year. In addition to managing floods, the structures were built to provide recreational uses with a pleasing community aesthetic. Pedestrian bridges and bike trails were included along with distinctive railings and lighting throughout the flood control corridor.

Key Flood Control Components:

- Over 7 miles of channel modifications and bank stabilization
- Rehabilitation of a low-head dam
- 1.3 miles of flood levees
- 4 grade control structures
- 13 pedestrian bridges
- Relocation of 1 railroad and 2 roadway bridges
- Minor modifications of 13 additional bridges
- Relocation and removal of 19 homes from the floodplain
- Visual innovations such as riprap covered with topsoil and sod



Source: Deb Las



Because Rochester’s flood control project uses seven upstream reservoirs, water is held back instead of flowing immediately through the watershed after a large rain event. Not only does this protect the City of Rochester, the upstream water storage helps downstream property to some degree, as well.

100 Year Flow Rate Comparison* (in cubic feet per second, or cfs)

Waterway in Rochester	Before Flood Control	After Flood Control
Cascade Creek	6,500 cfs	4,400 cfs
Bear Creek	13,500 cfs	8,900 cfs
Silver Creek	5,200 cfs	3,400 cfs
Zumbro River (37 th St. NW)	23,900 cfs	20,900 cfs

*Currently, a 100-year rainfall event is defined as 6.15” of rainfall in a 24 hour period.

The first true test of Rochester’s flood control project came in 2007. On August 18-19, a heavy rainstorm in the South Zumbro Watershed was greater than a 500 year rainfall event, far higher than the designed flood protection level of the flood control project. Total measurements varied from 6 to 12 inches across the landscape that flows into Rochester; the City itself received a record rainfall of 7.05 inches. There were problems reported with storm system flooding, basement flooding caused by surface and groundwater, and some slope failures. Significant sanitary sewer back-up problems were also noted, particularly in the Slatterly Park and Kutzky Park neighborhoods. (See Chapter 6 case study.) Despite these localized impacts, Rochester was largely protected from surface flooding, proving the effectiveness of flood control project.

In 2010, Rochester experienced another major flood event. That year, the City received a record 6.22 inches of rain in a 48 hour (September 22nd -23rd) period. Other locations in the watershed received even higher rainfall amounts. The South Fork of the Zumbro River crested 3 feet above flood stage at 17.16 feet. Each major storm event proves that the City’s investment in the flood control project was a good one.

A local resident recorded the 2010 flooding in Rochester and shared the event on YouTube:
<http://www.youtube.com/watch?v=4otPn9Xk0Y8>



Rochester Flood Severity

Date	River Level (Zumbro River Flood Stage at 37 th St is 14 feet)
July 6, 1978	23.00 ft.
September 21, 1986	20.77 ft.
March 1, 1965	19.12 ft.
March 29, 1962	18.46 ft.
October 18, 1955	18.00 ft.
June 23, 1908	18.00 ft.
July 21, 1951	17.50 ft.
September 23, 2010	17.08 ft.
June 21, 1974	16.86 ft.
August 19, 2007	16.68 ft.
September 15, 2004	15.57 ft.
March 26, 1952	15.43 ft.
March 11, 1973	15.34 ft.
March 4, 1906	14.64 ft.
April 6, 2001	~14.00 ft
February 9, 1966	13.93 ft.
April 6, 1965	13.55 ft.
June 4, 1958	13.54 ft.
May 1, 1973	13.36 ft.
March 31, 1952	13.26 ft.
March 11, 1967	12.45 ft.
June 24, 1952	11.60 ft.
March 27, 1967	11.45 ft.

Source: USGS

Cascade Confluence 2001



Source: Rochester Public Works

Silver Lake Dam 2007



Source : Rochester Public Works

As the flood control reservoirs were constructed, the stored and slowly released floodwaters lessened river level heights during flood events. Therefore, post-1986 flood levels cannot be compared equally to pre-1986 rainfall events. So, when about 7 inches of rain fell one day in April 2001, it was hardly noticed in comparison to the 7+ inch rainfall event of July 1978. High waters still flowed, but their extent was mostly limited to undeveloped or smaller, localized areas. Today, climate changes are creating more significant snowmelt and rainfall events that cause flooding. However, because of the flood control project, impacts of even larger events are minimized.



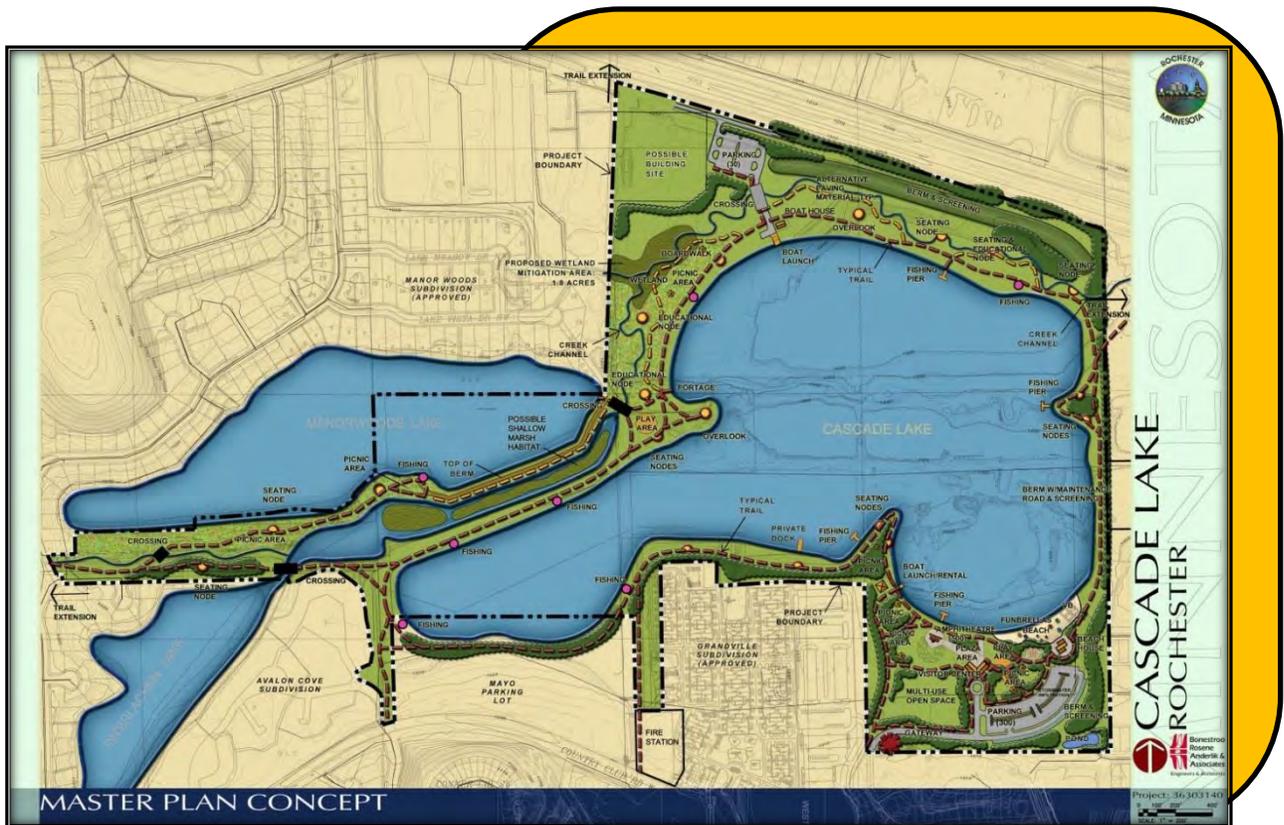
Rochester is connected to its waterways even through its City logo, which features a river and the Giant Canada Goose. At one time these birds were thought to have disappeared from the United States. Harold C. Hanson of the Illinois Natural History Survey discovered a remnant flock at Silver Lake in 1962. The geese were attracted by the open water caused by discharge of warm water used to cool the Silver Lake Power Plant's boiler. After the discovery, governmental agencies began monitoring and protecting the species. In the 1960's the fall/winter population of the giant Canada geese rose to about 6,000. By the 1970's, around 19,500 geese were calling Rochester home during the winter months.



GEESE: AN ASSET OR A LIABILITY? Did you know that too many geese in one area can cause water quality problems? Each goose produces about 3 pounds of droppings per day that are rich in bacteria and nutrients. When excess phosphorus and nitrogen reach surface water, unwanted algae growth can result. If large algae mats form, they use up the water's oxygen when they decompose, robbing fish and insects of the oxygen they need to live.

Looking to the Future

For many years, gravel pits have been turned into recreational water bodies or aesthetic features in Rochester. (See Chapter 4 – Rochester’s Constructed Water Bodies.) The City of Rochester is following that practice with the eventual formation of Cascade Lake in NW Rochester by merging several pits that have been mined for sand and gravel. The City has already begun park improvements, the most important of which was relocating Cascade Creek so it now flows around the lake instead of through it. This will help keep pollutants found in surface water out of the lake. A weir structure controls flow rates into the creek. The northern part of the park will be a natural area containing the creek and wetlands, along with a trail through a restored prairie area. Once mining is finished in 2015, the City will be able to begin development of the southern portion of the lake. That area will have trails, fishing and non-motorized boating access, and a swimming beach.



Source: Rochester Park Department Cascade Lake Master Plan

The surface elevation of Cascade Lake represents the top of the groundwater table. Since the lake water will consist primarily of groundwater, its clarity will be much better than with surface water.

Mine Pit Filled Primarily with Groundwater (7/03)

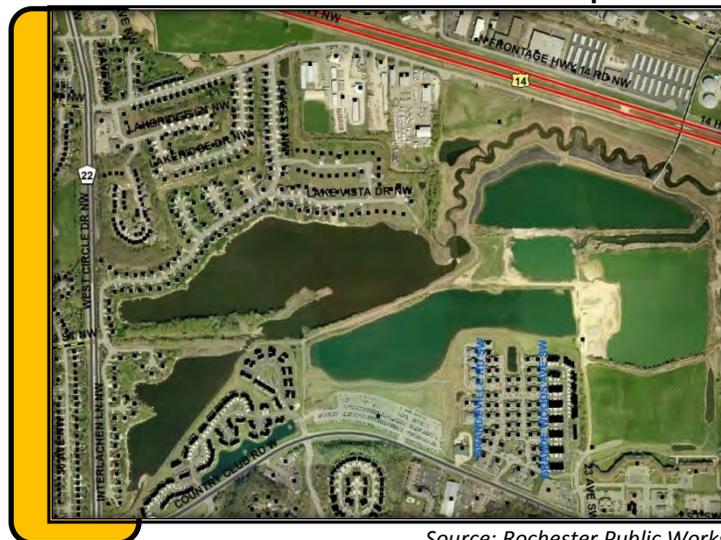


Mine Pit Filled Primarily with Surface Water (7/03)

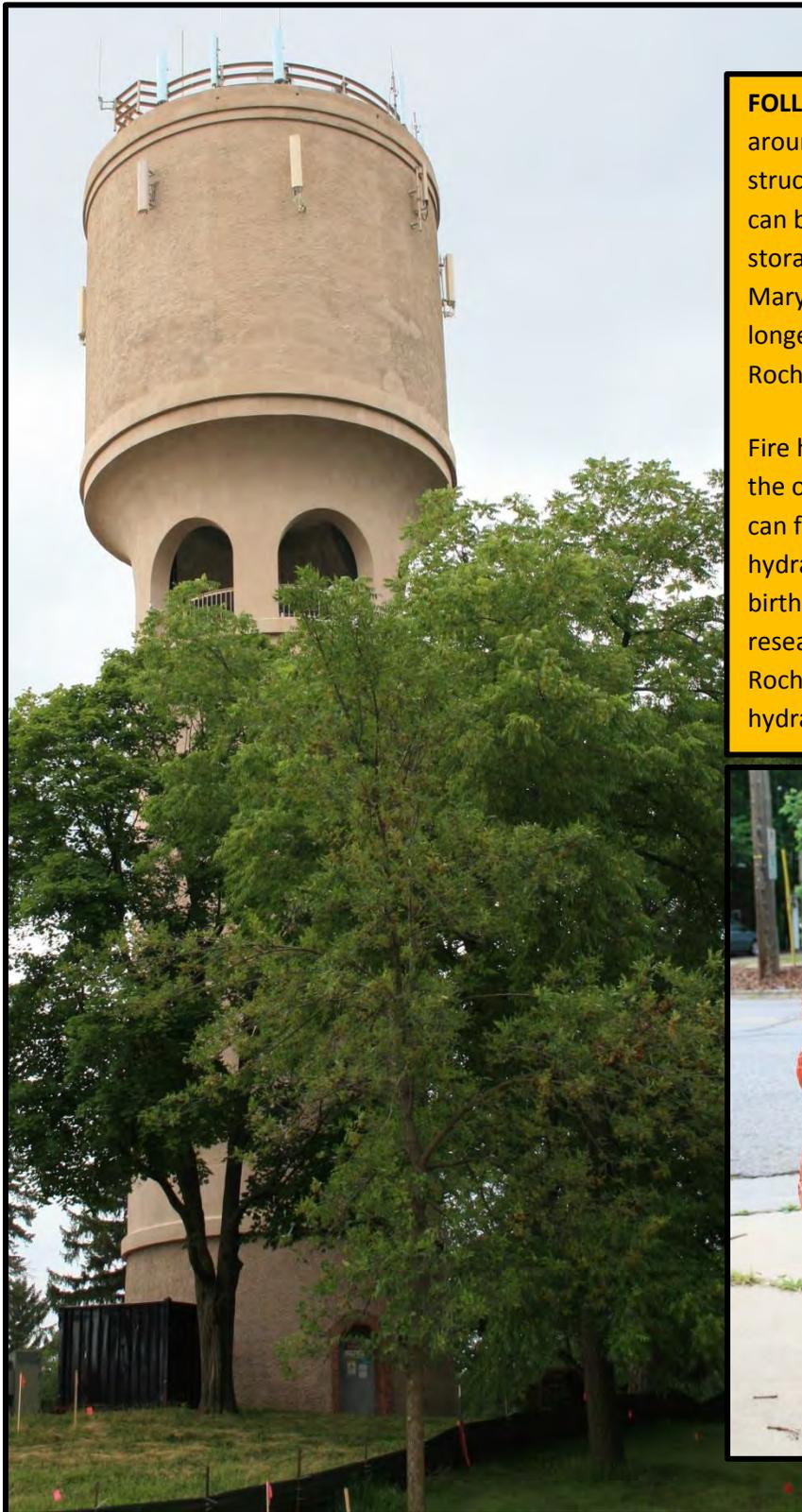


Source: Rochester Park and Recreation Department, Cascade Lake Master Plan

Aerial View of the Cascade Lake Area – April 2012



Source: Rochester Public Works



FOLLOWING HISTORY: All around Rochester water structures from the City's past can be found. The water storage facility behind St. Mary's hospital, although no longer in service, was part of Rochester's early water system.

Fire hydrants are dated. What is the oldest fire hydrant that you can find? Can you find a fire hydrant from the year of your birth? Select a fire hydrant and research what was happening in Rochester the year the fire hydrant was installed.



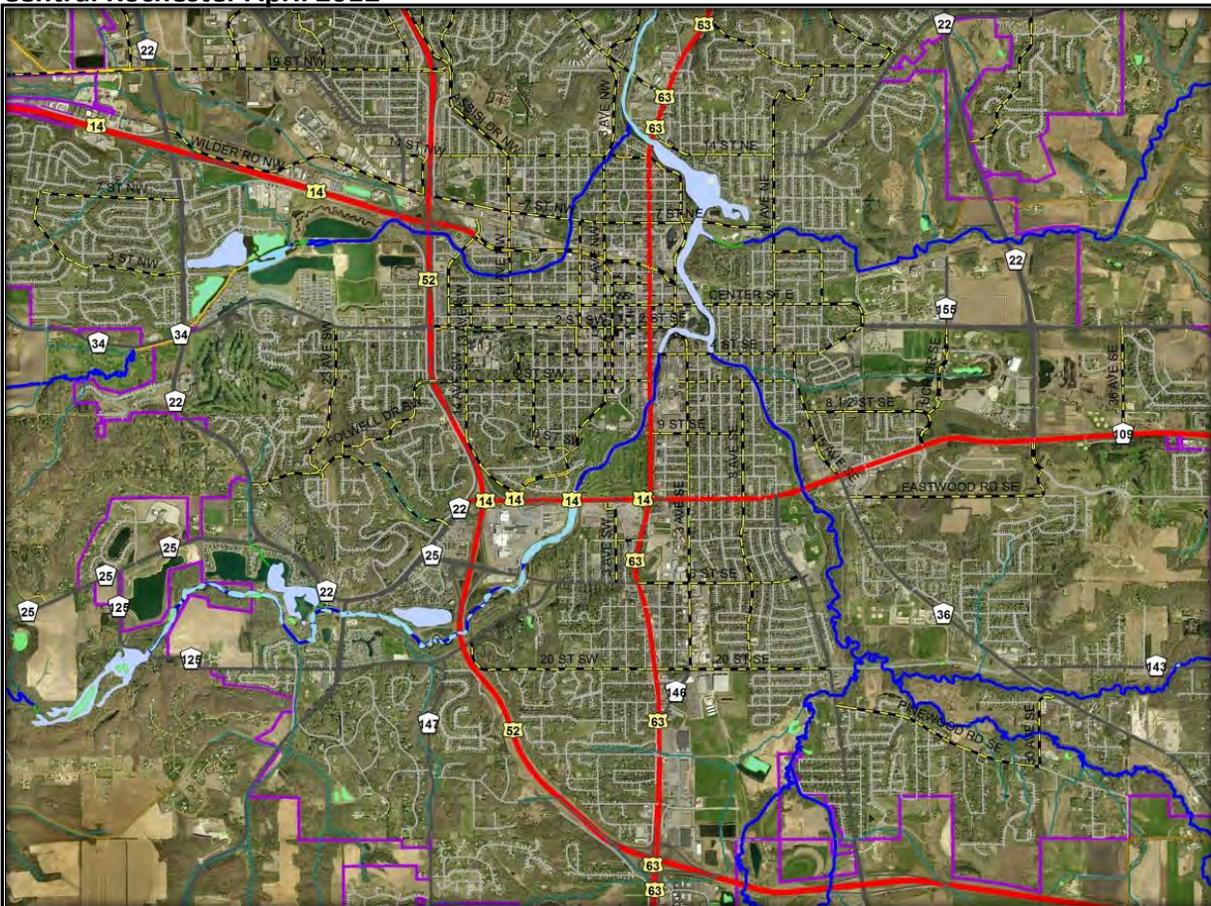
Source: Deb Las

Case Study: Rochester's Mill History

Rochester's first businesses, the flour and saw mills, were powered by running water supplied by the Zumbro River and its tributaries. Mill runs were built to redirect water to the mill foundations where large wheels could then be turned by the water currents. These wheels provided the mechanical energy needed to grind grains into flour or move saws to produce lumber. The mill runs are no longer present, but evidence of their locations still exists.

Below you will find a series of maps from different periods in Rochester's history, along with photos of Rochester's current street scene near 4th Street SE and the Zumbro River. These are arranged from current years to oldest years, so you will be going back in time as you proceed. When you look at them, make inferences about Rochester's mill run history. Where has the path of the Zumbro River changed? Why were the changes made? When were the runs active? What is now located where the runs were once located? State the evidence upon which the inferences are based.

Central Rochester April 2012



Source: Rochester Public Works

The yellow line on the aerial photo below shows the approximate location of a former mill run. The number on each of the eight labels matches a photo number on the following pages. By following the numbers and the photos, you will see what exists today along the former mill run alignment. Why would the mill run end in the middle of an intersection? (Hint: Look at the 1920 Sanborn map.)

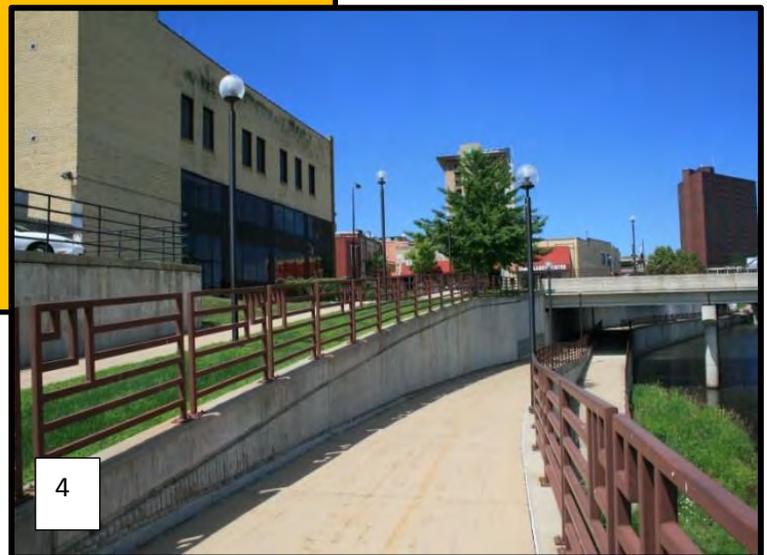
Former Mill Run

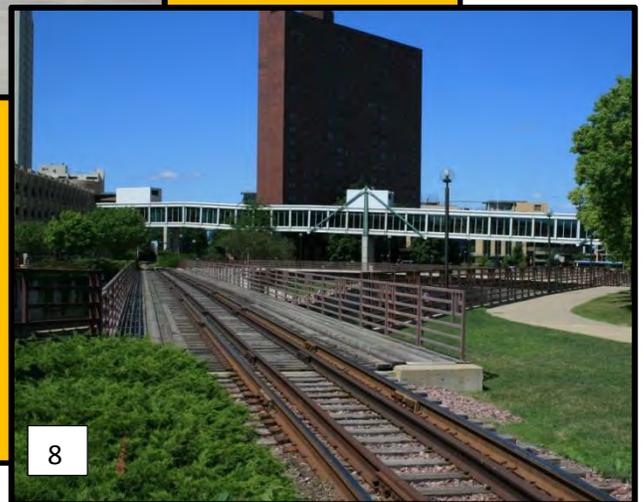




2013 Photos Taken Along the Path of the Former Mill Run
(See map on previous page)

Source: Deb Las





This railroad bridge was not on the mill run, but it once served the Rochester Milling Company flour mill. Can you see it on the Sanborn maps and in the old mill photos?



Rochester in 1958: 4th Street South and Broadway Area



Source: Olmsted County Soil and Water Conservation District



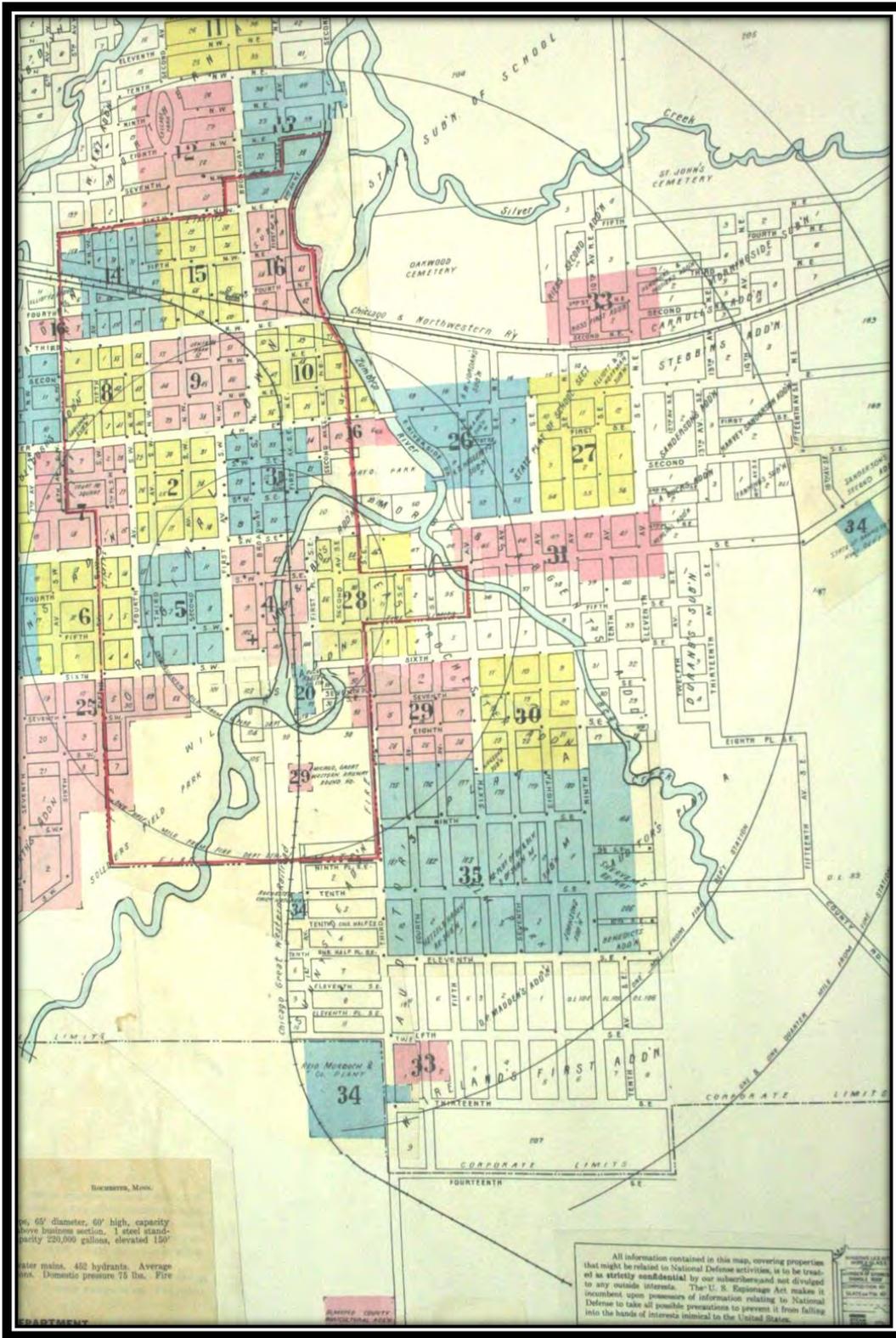
Rochester in 1940: 4th Street South and Broadway Area



Source: Olmsted County Soil and Water Conservation District



Rochester 1928



Source: Sanborn Map Company



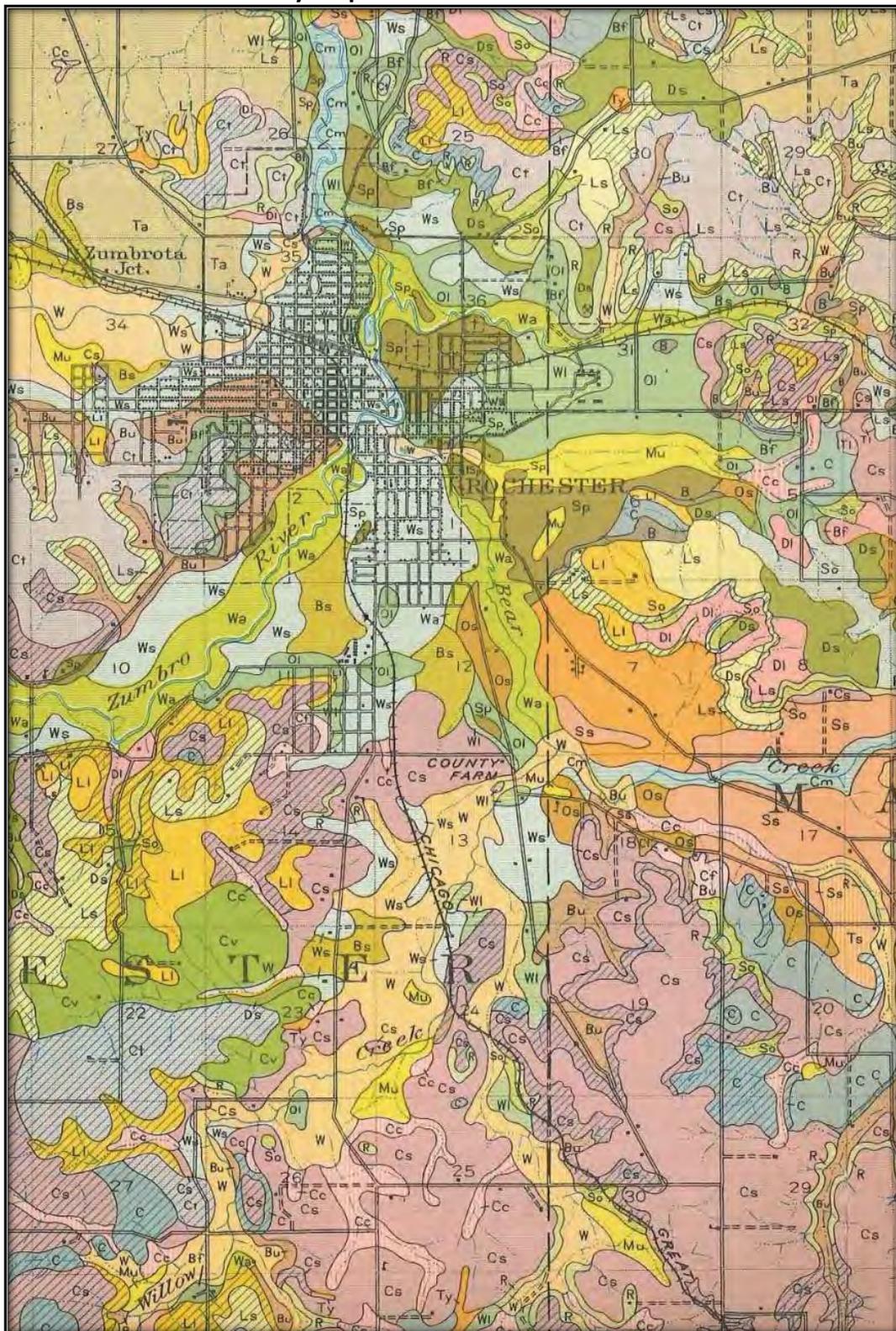
Rochester 1928



Source: Sanborn Map Company



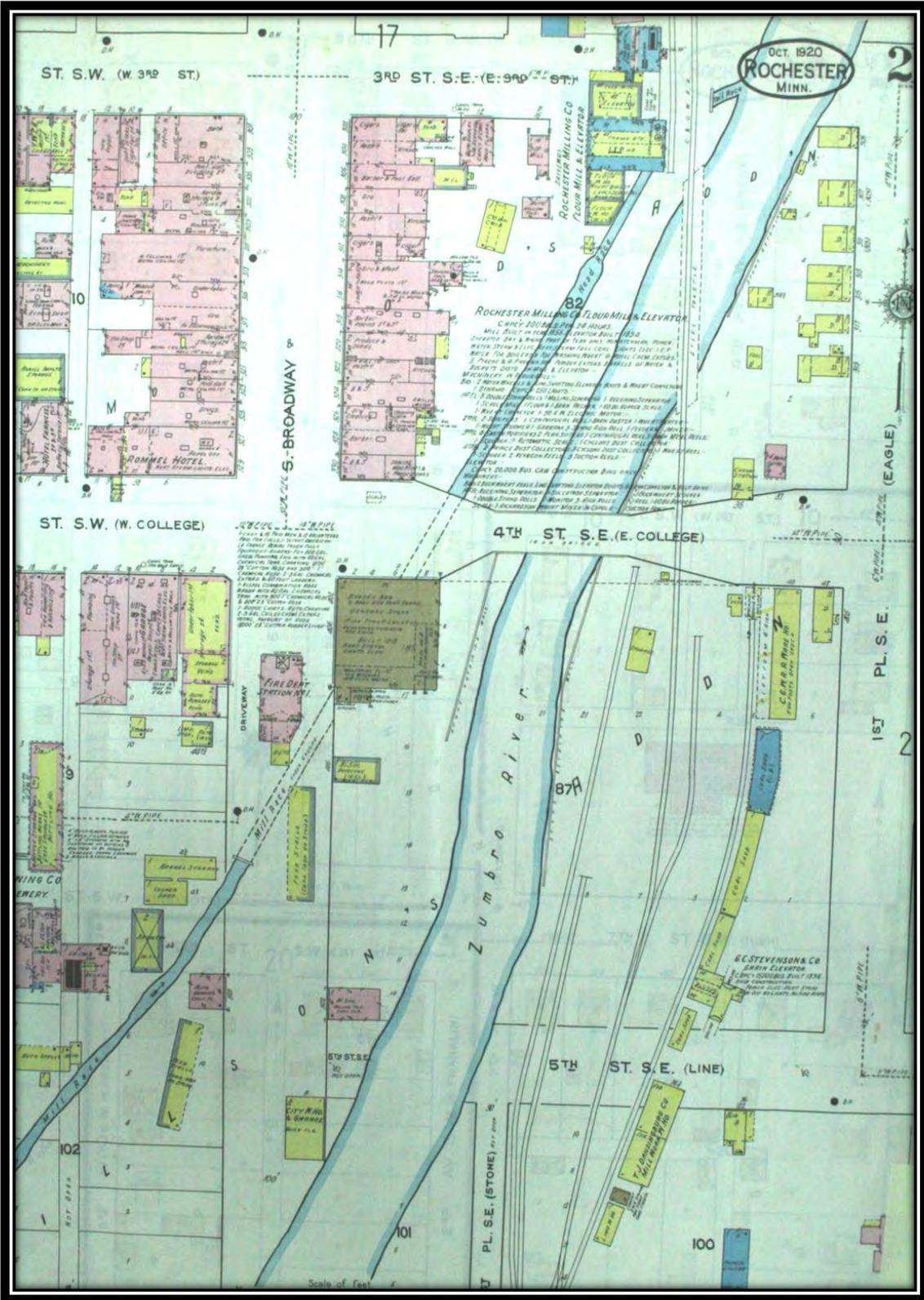
Rochester 1923 Soil Survey Map



Source: Soil Survey of Olmsted County, Minnesota by J. Ambrose Elwell, G. B. Shivery, B.H.Hendrickson, Mark Baldwin, and A. T. Sweet



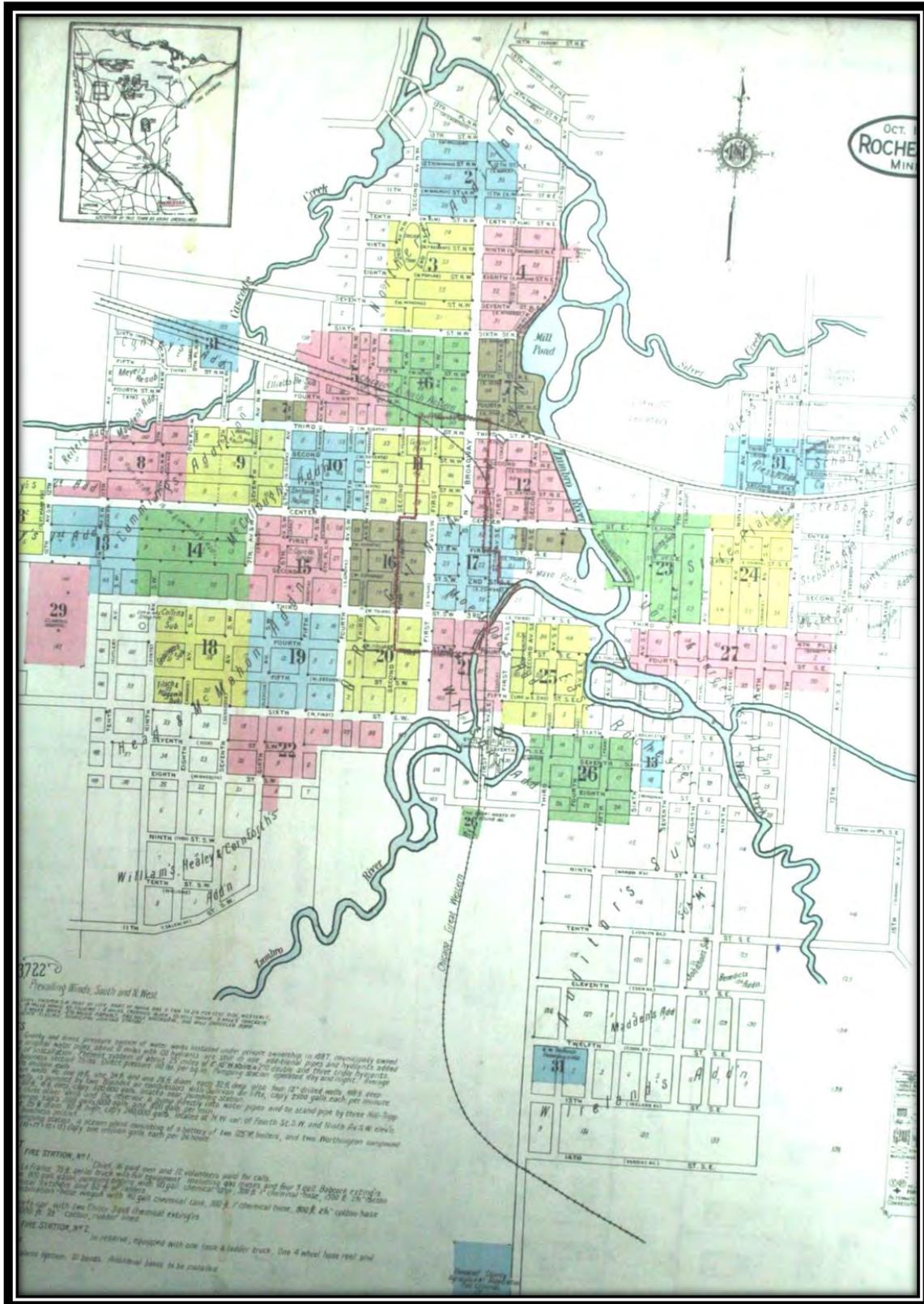
Rochester 1920



Source: Sanborn Map Company



Rochester 1920



Source: Sanborn Map Company



Rochester in 1857



Source: Rochester Public Works



Important Water Dates in Rochester's History

- 1855 or 1859(records conflict) First recorded severe flood in Rochester
- 1858 Rochester incorporated as a city
- 1873 Elevated water tower and wind mill pump installed (4th Street SE & Broadway)
- 1874 Four underground cisterns built
- 1887 Waterworks constructed by Hodgkins, Moffet, and Clark for the City lease
- 1895 Sanitary sewers installed
- 1903 Rochester Water Company flooded
- 1906 (March 4th) Record flood
- 1908 (June 23rd) Fourth Street Bridge in Rochester destroyed by flood and the Rochester Water Company was again flooded
- 1919 Lake Zumbro Hydropower Plant constructed
- 1924 Beginning of an extended dry period that continued intermittently through 1940
- 1925 Chlorinator installed to treat water
- 1926 Rochester's first wastewater treatment plant constructed
- 1929 Beginning of severe drought in Midwest peaks in 1934 (Dust Bowl Period)
- 1940 Upper Zumbro Soil Conservation District is formed (now the Olmsted SWCD)
- 1942 (June 4th) Cascade Creek floods resulting in 1 death
- 1951 (July 21st-22nd) First of 15 record floods from 1951 through 1974 (see Rochester Flood Severity Table)
- 1958 Rochester's second wastewater treatment plant constructed
- 1960 Fluoride used in water system
- 1962 Planning for South Zumbro Flood Control Project begun
- 1976 Drought in Midwest
- 1978 (July 5th and 6th) Worst recorded flood in Rochester history
- 1983 NRCS flood control reservoir project approved
- 1986 Corps flood control river channel project approved
- 1986 (September 21st) Rochester floods
- 1988 Record setting drought in Midwest
- 1990 Olmsted County's First Water Management Plan adopted
- 1995 Corps flood control river channel project completed
- 1996 NRCS flood control reservoir project completed
- 2001 (April 6th) First post-flood control project record rainfall event; minimal flooding
- 2003 Rochester obtains its first storm water management permit
- 2004 (September 15th) Record rainfall event, minimal flooding
- 2007 (August 18th – 19th) Record rainfall event – minimal flooding
- 2010 (September 23rd) Record rainfall event, minimal flooding