

Appendix 4

A History of the Village's Water System and the Factors Influencing Milestone Decisions

“On December 12, 1885, 59 area residents, mostly Quakers, braved the wintry weather to assemble in the tiny railroad depot to consider the question of incorporating Western Springs. By a relatively narrow vote of 34 to 25, the referendum for incorporation was passed.”¹ At that time, the Village's water supply consisted of free running springs for which the town was named. The primary spring had a discharge rate of 40 gallons per minute (GPM). By 1890, the population had swelled to 451 and the springs were no longer adequate. In April of 1892 the village board awarded a contract for building a tower (with a 133,000 gallon tank), a well, well house, pumps, mains and fire hydrants. The total contract price was \$79,119.10. Site for the tower was deeded in January of 1892 with the expressed intent that the land be used as a site for the tower and village park.

In 1893, three shallow wells were dug in what is now Springrock Park. Eleven miles of main were laid between the reservoir under the pump house near 47th & Central, homes throughout the Village, and to the water tower at Hillgrove and Grand. Due to water quantity and quality issues, in 1912 the Village's Light and Water Committee recommended drilling a well to a depth of 1800'-1900' into the Potsdam Sandstone, which contained water softer than Lake Michigan. It was further recommended that the new well, pump house and power plant be located adjacent to the water tower north of the railroad tracks. That site was eventually rejected and in April of 1914, the first deep well was completed adjacent to the shallow well in what is now Springrock Park. The new well was 2,046' deep with a hardness of approximately 50 grains and a capacity of 100 to 125 gpm. The well, pump and pump house were constructed for under \$10,000.

Hardness continued to plague the Village's water system, and in March of 1917, the Village purchased its first municipal water softener for \$1,500. The “Dodge Automatic Water Softener” was a lime and soda boiler capable of softening 10 gpm.

In 1923, well #1 was drilled to a depth of 400 feet at the corner of Wolf and Burlington for a cost of \$5,837. It was constructed with a brick liner to resist corrosion. This well had a harness of 63 grains. This well remains in operation as of 2006.

From 1920 to 1930, the population of Western Springs tripled from 1,258 to 3,784. In April of 1928, residents voted 378 to 145 in favor of issuing \$25,000 in bonds to acquire land and drill a second well. In April of 1929 the Village contracted with Fairbanks-Morse to locate a well site capable of producing water with a maximum hardness of 15 grains. Fairbanks-Morse eventually found a site in the Forest Preserve north of Ogden Avenue which met the contract requirements. Additional tests determined the water was not of sufficient quality and the contract was terminated without a single cent ever paid to

Fairbanks-Morse. With no suitable water able to be located, it was proposed to drill a second shallow well and construct a water treatment plant.

The demand for water required the drilling of a second well at Johnson and Hillgrove in 1930. This well was drilled to 312 feet and drew water with a hardness of 59 grains. In June of 1931, the Village awarded contracts to Burnip Construction Co. in the amount of \$74,600 for the construction of a lime and soda ash treatment plant to be constructed on land adjacent to Well #2. The plant opened on January 10, 1932. In June of 1935 rates were established as follows:

First	2,700 gallons	\$2.22
Next	14,000	.55
Next	17,000	.45
Over	33,700	.35

The water system remained relatively unchanged until the mid-1950's. In the early 1950's the Village continued to face water shortages and was running an annual deficit of approximately \$21,000. In December of 1953 a Water Council was formed of "...several residents who were important engineers for large companies...who could make a survey which would be of more value than that of a consulting engineering firm."

In May of 1954, the Council submitted their report to the Village Board at a Special Workshop. The Council recommended the construction of a 300,000 to 500,000 gallon above ground reservoir adjacent to the water plant and a third well be dug to the Galesville strata 1,500 to 2,000 feet deep near the water plant yielding 1,000 gpm. This water would be 2/3rds softer than the shallow wells. It was estimated the cost of said improvements would be \$150,000 but could be paid for entirely in 15 to 20 years by the savings in treatment costs without raising water rates.

Plans to build a 500,000 above ground steel tank stirred controversy in the neighborhood. Several residents of Johnson Avenue near the proposed site filed suit against the Village to stop construction. In December of 1954, Judge McKinley stated that if the parties could not reach an agreement he would order a tank no more than 300,000 gallons, 60 feet in diameter and 15 feet above ground. After meeting with the protesting residents, it was agreed that a 500,000 gallon concrete reservoir would be constructed with eight feet above ground and 10 feet below grade. Although the community only needed 300,000 gallons of storage, the development of Springdale and Lyons Township High School prompted the Village to oversize the reservoir. In May of 1955, the Village awarded contracts in the amount of \$62,000 for Well #3 and \$133,000 for the 500,000 gallon reservoir.

It was originally planned to drill Well #3 adjacent to the water plant, yet concerns over the construction and the proximity to Well #1 resulted in the well being drilled south of the existing Village Offices at 4353 Wolf. Drilling began in August of 1955. In January, the Well had been drilled to its final depth of 1,600 feet with a water table of 430 feet. Unfortunately, it did not produce the desired production volume. On January 16th an eighth shot was made with 400 pounds of dynamite. In August of 1956, the well was put

in operation. The pump was set at 550 feet. It produced 1,100 gpm with a surface head of 50 pounds and 33 grains of hardness (mostly magnesium).

In March of 1958, just a few years into operating that well, as the aquifers continued to be depleted, the Village was required to lower the pump in well #3 an additional 120 feet to 670. In September of that year, the Village selected an engineer to make a preliminary layout and cost estimate on necessary water plant improvements. In December, the engineers presented a two-phase project consisting of an Accelerator, recarbonator, additional sand filters, building additions, construction of an elevated tank, and the sinking of an additional well. The total project was estimated at \$375,000. Due to outstanding bonds, the Village was only able to finance the first phase of the project. Rates were raised 15% in January of 1959 to finance alternate revenue bonds in the amount of \$155,000 for the construction of an accelerator, the reconstruction of the sand filters and the installation of new recarbonation equipment. This was the first rate increase since 1935. Rates were as follows:

First	2,700 gallons	\$2.56
Next	14,000	.63
Next	17,000	.52
Over	33,700	.45

The Board awarded the contract for said construction to W.T. Mahoney and Sons in March of 1959 for that work in the amount of \$93,506. In August of that year, the Village awarded additional work to W.T. Mahoney in the amount of \$89,320 for the construction of a second set of filters, extending the building.

In March of 1959 Western Springs and LaGrange installed a cross connection between the Villages at Hillgrove and Gilbert. This connection was essential in allowing Western Springs to shut down its treatment plant for improvements. The connection cost \$1,850 and was split by the two municipalities.

In March of 1961, bids were opened for the construction of a 1,000,000 gallon storage tank. Although alternate bids were received for an ornamental tank, the cost effective design of cross member supports was selected. On April 15, 1963, the tank was filled and placed into operation. There was a tremendous amount of disruption to the distribution system. Most of that was attributed to higher pressures, reversal of flow, and the new tank being higher than the tank in the historic water tower.

By July of 1963, the Village was again facing water emergencies. The first official ordinance to ban water usage was passed that year (Ord. 1260). Even though the Village was operating three wells, it still could not keep up with demand. In September of 1963, the Village began discussing the drilling of well #4. Sites were evaluated and narrowed to Linden and Hillgrove, and Western and Hillgrove. Due to the time and disturbance associated with drilling, it was determined the Western Avenue site was preferable with no immediately adjacent neighbors. Additionally, the Village already owned some land in that area, and there was ample space to dig a receiving pit for sludge. In May of 1964, bids were opened and a contract awarded to dig a deep well into the Galesville strata.

Later that year the Village discussed drilling a shallow well adjacent to the deep well then being drilled. It was thought this would be cost effective and would alleviate the need for any new wells in the foreseeable future. Water was to be tested at 400' for adequacy though it appears the idea was abandoned. On October 6, 1964 a drill bit became lodged in the well shaft and from there problems continued to plague the project. By February of 1965, the well had only been dug to 800' and there were questions of the adequacy of the shaft width. Ultimately, the contract was terminated and a second contractor picked up the project in September of that year. Meanwhile, the Village set yet another all time pumpage high on June 19, 1965 churning out 2,907,082 gallons in one day.

Continued Use of Well Water

Western Springs relies on two wells that draw from deep sandstone aquifers. In part, the decision as to whether or not to pursue Lake Michigan water must consider the long-term viability of the regional sandstone aquifers as a water supply.

The sandstone aquifers of interest underlie northern Illinois and southern Wisconsin and are generally recharged with water in Boone, Winnebago, DeKalb, Ogle and Lee Counties. During the past decade, the pumpage from these aquifers has been in fairly good balance with their practical sustainable yield of approximately 65 mgd and water levels in the aquifers have been generally steady.

This has not always been the case. Until the large Lake Michigan water allocation projects were completed in the early 1990s, pumpage from the aquifers had grown to be greater than 180 mgd; three times the safe yield. As a result, water levels were declining quickly and water quality was becoming poorer.

The projected growth of the Chicagoland area, particularly to the west, north and south of the Lake Michigan allocation areas, and the over pumping of the sandstone aquifers that could resume may put Western Springs' source of water into jeopardy over the long-term (50 years).

Based on information from NIPC and the Illinois Department of Transportation (IDOT), the populations of McHenry, Kane, Will and Kendall Counties are expected to grow from 1,221,000 persons in 2000 to a total of 2,381,000 persons in 2030; an increase of 1,160,000. Many of these people will have to rely on the same aquifers as Western Springs.

Assuming that water usage will be approximately 80 gallons per capita per day (including business uses), and that 60 percent of the new users will use the sandstone aquifers (the others will use local, shallow sand and gravel or limestone aquifers) water use to the west of Western Springs will likely increase by 56 mgd in the next 25 years, and growth is expected to continue after 2030.

The practical sustainable yield of the sandstone aquifers may soon be exceeded by the increasing demand thereby making the long-term sustainability of the aquifers as a source

of water to Western Springs questionable. It is possible that the use of the aquifers may be managed in the future in a manner that may mitigate this potential problem, but there is no assurance that this will be the case.

Lake Michigan Water

Lake Michigan, the second largest Great Lake by volume with just under 1,180 cubic miles of water, is the only Great Lake entirely within the United States. Approximately 118 miles wide and 307 miles long, Lake Michigan has more than 1,600 miles of shoreline. Averaging 279 feet in depth, the lake reaches 925 feet at its deepest point. The lake's northern tier is in the colder, less developed upper Great Lakes region, while its more temperate southern basin contains the Milwaukee and Chicago metropolitan areas. The drainage basin, approximately twice as large as the 22,300 square miles of surface water, includes portions of Illinois, Indiana, Michigan and Wisconsin.

Village Board Meeting minutes date discussions of obtaining water from Lake Michigan for the Village as far back as 1950. Even then, there was concern over the cost of constructing a main all the way to Chicago. In the mid-1950's the State legislature discussed creating an area wide water district to provide Lake Water to the towns around Chicago including Lake, Cook, DuPage and Will counties. In March of 1952 the "...Village was contacted by the Drainage, Sewerage and Water Supply Department of the Western Society of Engineers to ascertain the Village's desire to participate in a plan to bring water from Lake Michigan to the Western Suburbs." (Minutes of the Regular Meeting of the President and Board of Trustees of the Village of Western Springs March 17, 1952). Later that year the Suburban Water Conference was formed to study transmission of Lake Michigan water to the suburbs. The Village participated in the Conference. The Village's Water Council Report submitted to the Village Board in 1954 stated, "The possibility of securing Lake Michigan Water has also been investigated and the feeling is that it will be at least 10 years before this could be done."

No such large water entity was ever formed though many smaller local water commissions did develop. Had the Suburban Water Commission formed, the Village still likely may not have participated. The Village Board was concerned about "bondage" to another corporate authority. This fear was promulgated by the 50% water rate increase imposed by Chicago in 1956. The Village's rate on the other hand had not increased since 1931 and was only raised 15% in 1959 to fund additional plant improvements.

In October of 1958, the Village Manager reported to the Board that the Tri-City Water Commission (comprised of whom?) began selling bonds for their project to get Lake Water. At that time, the Commission was not interested in adding additional communities. The Village also contacted Lyons Township about their plans to build a transmission line to the Lake for the all Township communities to utilize. At that time, the Township indicated that plans were in the very preliminary stage and that nothing would come of the discussions for several years.

The Village continued to face water difficulties and shortages throughout the 1950's. In 1960, the Village continued to explore options. Lake Water was again raised and discounted citing the cost of purchasing water second-, third-, and forth-hand through

multiple jurisdictions. Moreover, water shortages throughout the suburbs caused concern among Village fathers that increased usage by Chicago or intervening towns could leave Western Springs with inadequate supply. Additionally, water disputes between Illinois and other states along the Great Lakes further diminished the appeal of lake water.

In 1967, a U.S. Supreme Court decree limited the amount of water that the State of Illinois could take from Lake Michigan. The General Assembly has since assigned the Illinois Department of Natural Resources (IDNR) with the task of allocating the supply of Lake Michigan water in Illinois. In 2004, there were 201 water allocations in Illinois, which summed to a total of 1260.645 mgd average daily flow. The current limit for removal from Lake Michigan is 3200 cubic feet per second (cfs) or 2068 mgd. However, this 3200 cfs is not limited to just municipal use but it is also allocated for navigational, leakage, lockage and discretionary diversions.

The utilization of Lake Michigan water has been investigated on multiple occasions by the Village staff, Board, and consultants. Each time it has been rejected because as it is not economical, nor does not offer any additional benefits in terms of water quality, supply, or reliability.

In 1972, Lindley & Sons *Water System Study* proposed the construction of a third deep well as Well #5. At that time, the closest source of Lake Water was the Brookfield Water Commission. The Village chose to stay with the aquifer system rather than incur the cost of the transmission main and the potential loss of control of water rates. Well #5 was also never constructed.

In 1983, the Village was granted a Lake water allocation of 1.2 million gallons per day. This issue of Lake Water was again studied with the same conclusion. The Lake Water allocation was renewed in 1988 although the Village had not utilized the allocation. In 1995 and 1998, the Lake Michigan water alternative was studied once again and determined not to be a viable long-term option for the Village.

The Village of Western Springs does not currently have an allocation for Lake Michigan water. In 1999 the allocation was revoked “without prejudice” which would allow the Village to reapply for an allocation in the future. The IDNR was contacted on behalf of the Village and it was discovered that it is possible for the Village to reinstate their allocation by following the application process and submitting a formal letter of petition, if this is the direction the Village chooses to pursue. It is common for villages that have deep wells, such as Western Springs, to receive a Lake Michigan allocation if the intention is serious. The IDNR is nearly finished paying off the water debt and the direction that the IDNR is now heading appears to have the flexibility to meet future water supply needs for Illinois communities such as Western Springs.