VILLAGE OF GLENWOOD

ALTERNATIVE WATER SUPPLY ANALYSIS

WELL WATER

REL PROJECT 12-583

Prepared By:

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Village of Glenwood
Alternative Water Supply Source Analysis
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1.0 Introduction

The residents of the Village of Glenwood are currently supplied Lake Michigan water from a pipeline from the City of Hammond, Indiana. Recent contract negotiations have shown that Hammond is raising their wholesale water rate by more than 4 times what they currently charge. As such, Robinson Engineering, Ltd. (REL) has been tasked with providing cost estimates and alternatives to receiving Lake Michigan Water from the City of Hammond. Because of the well-publicized rate increase recently imposed by the City of Chicago, simply switching suppliers of Lake Michigan water is not a feasible option as it will likely not reduce costs for the Village of Glenwood; therefore, this option was not studied.

The only other wholesale supplier of Lake Michigan quality water in the vicinity is Illinois American which treats water from the Kankakee River and distributes it to several southern municipalities. The closest this treated water is to the Village of Glenwood is currently University Park. Because of the likely treatment and transmission costs to get this water to the Village of Glenwood, this option was also not explored.

The contents of this report primarily focus on supplying potable water through wells. The Village of Glenwood used to be supplied by well water before switching to Lake Michigan Water in the 1980s. The best available information regarding these wells (most of which were drilled in the 1960's) was obtained through research of Robinson Engineering archived files as well as historical information obtained from the Illinois State Water Survey.

REL was retained to develop recommendations, preliminary design information, and cost estimates for providing safe water in sufficient volume as an alternative to Lake Michigan water. Contained in this report is an evaluation of the options available to Glenwood for locally sourcing potable water from wells as a supplement or alternative to receiving Lake Michigan Water from the City of Hammond, Indiana in order to allow Glenwood to analyze the costs of transferring all or parts of its water distribution system to well water.

These options include:

- Wells only, no water treatment necessary
- Wells and water treatment plant construction to remove the assumed iron and hardness from the well water

The costs that are presented in this study are for water infrastructure that are capable of meeting the water demands up to the year 2040 as forecasted by the Chicago Metropolitan Area Planning Agency (CMAP) as well as the Illinois Department of Natural Resources (IDNR) Water Allocation Data discussed in Section 2 of this report.

2.0 Estimate of Water Usage

The current population of Glenwood is approximately 9,300. The CMAP projection for Glenwood is 10,521 for the year 2040 (see Appendix 1). This study will use this projected population as the basis of design for the water system capacity.

Based on the IDNR's Annual Water Use Audit Form (LMO-2), Glenwood's net annual pumpage for 2010 and 2011 was 930,000 gallons per day and 990,000 gallons per day, respectively (see Appendix 1 for full LMO-2 reports). .

The Illinois Department of Natural Resources (IDNR) publishes the Lake Michigan Water Allocations per community on a regular basis. The current allocations for the Village of Glenwood are:

Year	Allocation (Million Gallons Per Day)
2009	1.122
2010	1.138
2011	1.155
2012	1.171
2013	1.187
2014	1.204
2015	1.220
2016	1.237
2017	1.253
2018	1.270
2019	1.286
2020	1.303
2021	1.319
2022	1.336
2023	1.352
2024	1.369
2025	1.385
2026	1.401
2027	1.418
2028	1.434
2029	1.451
2030	1.467

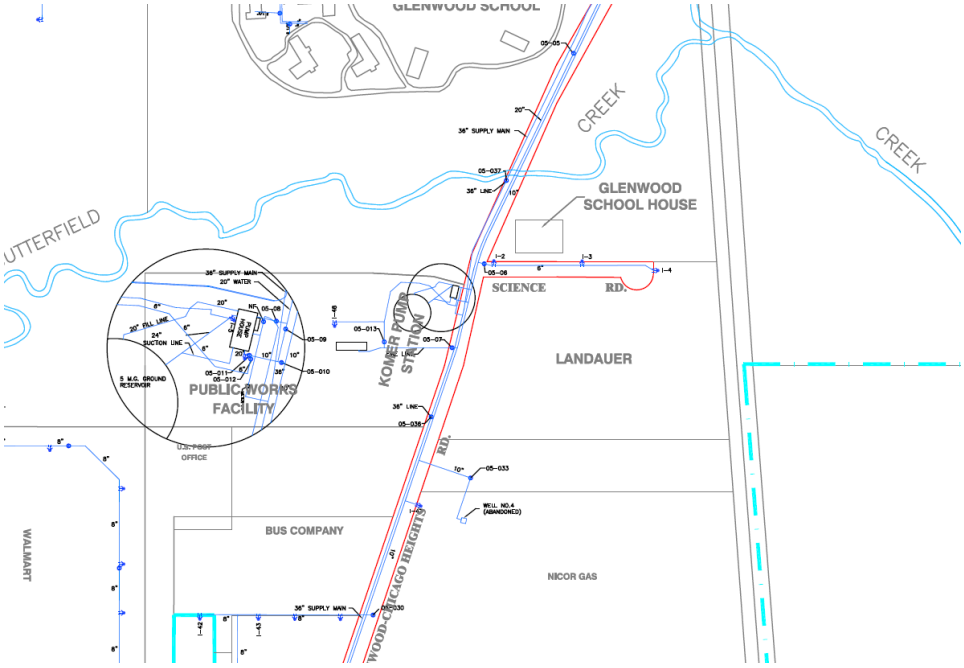
Based on the LMO-2 net annual pumpage data, Glenwood's current average water usage is 106 gallons per day per person (990,000 gallons per day/9,300 population). With this usage rate and using the CMAP population projections rather than the IDNR allocations, the projected average day water demand for the Village of Glenwood in the year 2040 is 1.115 million gallons per day (10,521 population multiplied by 106 gallons per day per person). The projected peak day water demand for the year 2040 is 2.230 million gallons per day (two times average day demand). For the purposes of this report, including the analyses and cost estimates, this is the water usage that will be used throughout.

Not included in this evaluation are the costs for additional facilities such as water storage towers that may be necessary to meet the projected water demand in 2040 as these costs will only be necessary as development occurs (for fire flow) or to meet any contractual obligations for Lake Michigan water (some contracts require a specified storage amount for emergencies).

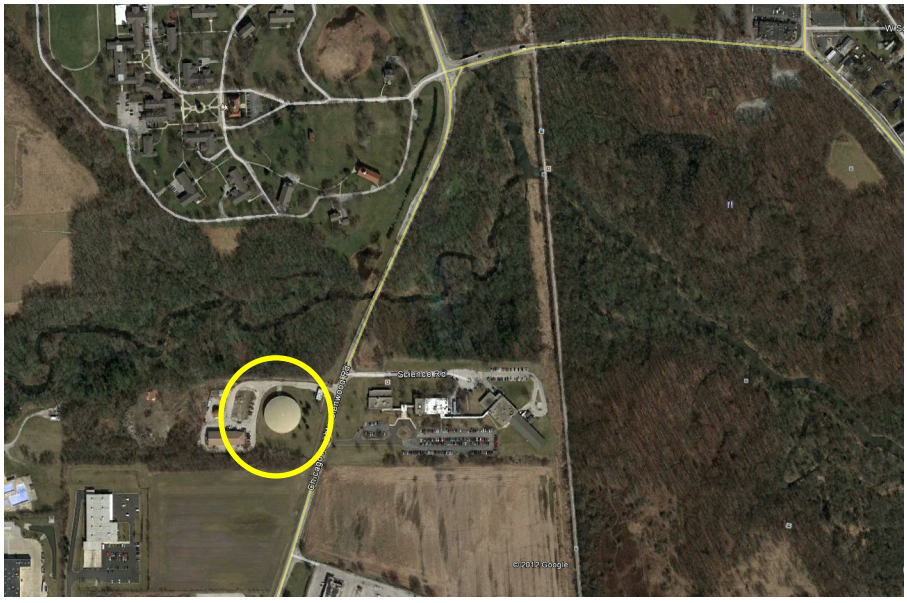
3.0 Existing Water Facilities

3.1 Existing Public Water Supply

The Village of Glenwood pumps and treats Lake Michigan water for their municipal water supply. Lake Michigan water is received from a meter vault and 20-inch water main fed by the 36-inch transmission main on Glenwood - Chicago Heights Road near Science Road. The 36-inch transmission line supplies Lake Michigan water from the City of Hammond, Indiana.

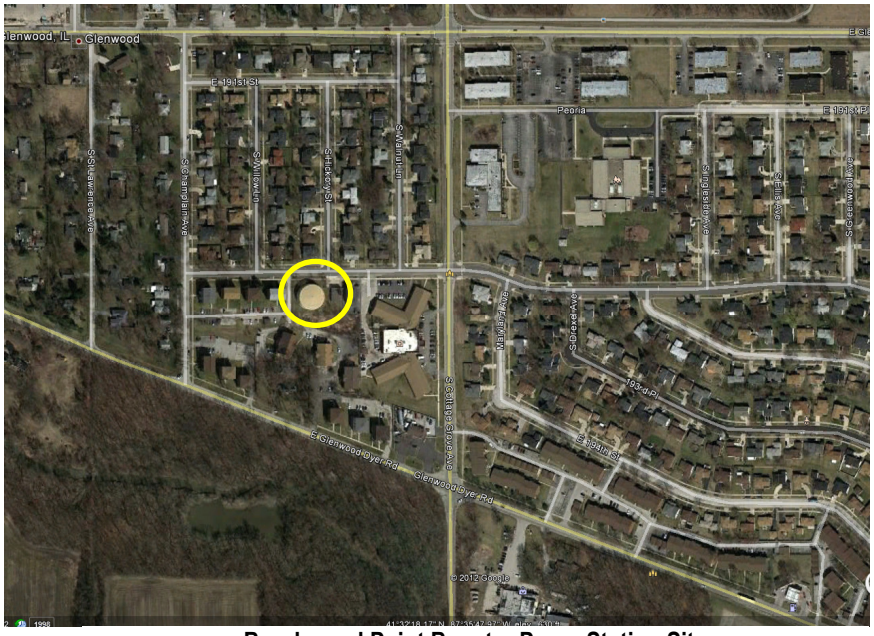


Water Atlas Excerpt



Komer Booster Pump Station Site

The Village has two booster stations which are then used to pump the Lake Michigan water through the water distribution system. The first booster station is at the Komer Booster Station site located at Glenwood Chicago Heights Road and Science Road



The second booster station is located in the Brookwood Point subdivision located at 192nd Street and Hickory Street.

Brookwood Point Booster Pump Station Site

Lake Michigan water is stored at these locations and then distributed through the system as necessary.

3.2 Existing Water Storage Facilities

The Village currently has two elevated tanks and two ground storage reservoirs within the community with a total storage capacity of 6,400,000 gallons.

Site	Type of Storage	Capacity (gallons)
Arquilla Drive	Spheroid Elevated Tank	200,000
Rose and Rebecca	Legged Elevated Tank	200,000
Komer Booster Station	Ground Storage Reservoir	5,000,000
Brookwood Point Booster Station	Ground Storage Reservoir	1,000,000

To maintain adequate capacity for firefighting and system demands, the American Water Works Association (AWWA) typically recommends that systems have a minimum amount of storage equal to a minimum of 25 percent of the system's firm capacity. However, this does not take into account the specific needs of each community, such as increased firefighting requirements, peak demand patterns, and large volume water users. At a total storage capacity of 6,400,000 gallons, the Village has storage equal to almost three times the projected 2040 peak demand. For Lake Michigan water communities, it is typically recommended that the community have at least two days of average day demand in storage. Under both of these scenarios the Village of Glenwood's storage capacity exceeds the requirements for population projections through 2040. While the system appears to have adequate storage capacity for meeting peak day demands and any increased firefighting needs, additional storage may be required in the future to help maintain system pressures, depending on system development.

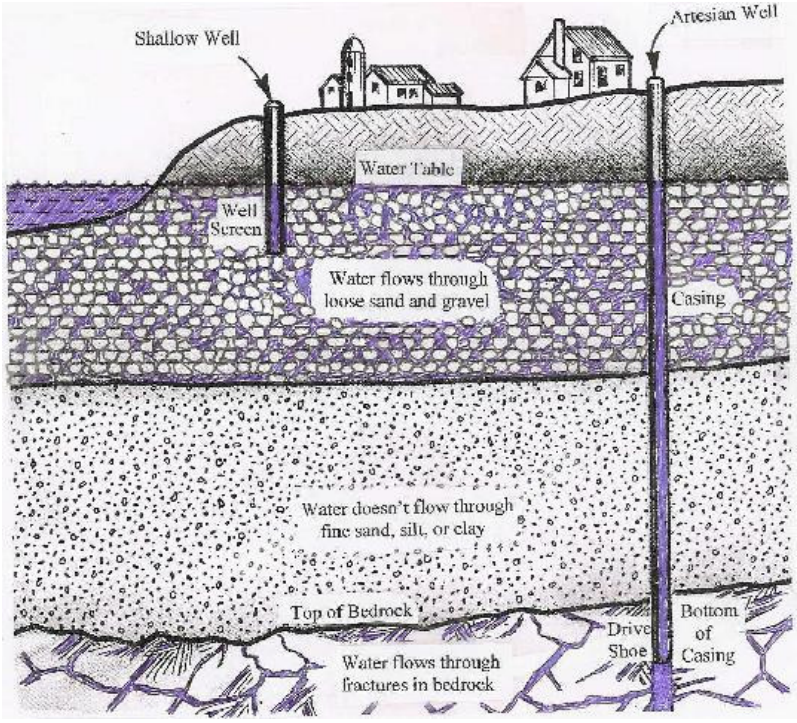
3.3 Existing Water Distribution Mains

The Village has approximately 43 miles of water main providing service to residential and commercial customers. The water main sizes range from 6-inches to 20-inches. Water is distributed throughout the system by the two booster stations while system pressure is stabilized by the elevated tanks.

3.4 Identification of Previous Wells

There are typically two types of wells used to supply a municipal system with water; shallow wells and deep wells or bedrock wells. Shallow wells rely on water that travels through spaces in loose sands and gravels. Because they are not very deep, they may be fitted with either surface-mounted or submersible pumps or motors. With this type of well, the depth to the water table and the type of soil encountered will determine how much water, if any, can be pumped from the ground.

Deep wells are generally deeper and fitted with submersible pumps and motors. With this type of well, a drilling rig is used to bore through the soil and rocks and into bedrock until the borehole intersects with fractures that exist naturally in the bedrock. This factor determines how much water, if any, can be pumped from the ground.



Based on archived file research, the Village of Glenwood owned and operated at least five wells for locally sourced water before switching to Lake Michigan Water in the 1980's. Archived file information as well as research through the Illinois State Water Survey shows that several wells were drilled within the Village limits as long ago as 1927 and as late as 1969. The research primarily indicates Glenwood had a total of five wells, three wells (Wells 1, 2 and 4) were shallow wells and two wells (Wells 3 and 5) were deep wells. Once Glenwood started introducing treatment (iron removal with pressure filters and softening) in the

Village, Well 3 became the primary well and a new deep well, Well 5, was drilled with the intention of providing iron removal at that well also. Wells 1, 2 and 4 which had experienced diminished flow, were maintained but were to only be used during emergency situations as needed. Records show the deep well produced about 950 GPM. All of the information found regarding the wells is contained in Appendix 2.

The following table summarizes the Village's water quality as found in Well 3 which was the first deep well (1789 feet) drilled in the Village.

GLENWOOD WATER QUALITY

Water Quality Parameter	Actual Tested Value (1965)	Normal Range	Lake Michigan Water	Comments
Total Dissolved Solids (TDS)	1,731 mg/l	Less than 500 mg/l	170 mg/l	High TDS may cause pipe corrosion, deposits, colored water, salty taste
pH Units	7.6	8 to 8.5	7.4	Low pH may cause corrosion
Hardness (Calcium and Magnesium)	773 mg/l	Less than 120 mg/l	135 mg/l	High hardness may cause scaling of water piping and increased soap consumption
Iron	2.1 ppm	Less than 1.0 mg/L	0 mg/l	High iron may cause staining and deposits, rusty colored water
Manganese	0.5 ppm	Less than 0.15 mg/L	0 mg/l	High iron may cause staining and deposits, rusty colored water, unpleasant taster and odor

Based on the information contained in the above table, it is evident that Glenwood's well water was not of the same quality of water as Lake Michigan; therefore treatment would be warranted in order for the well water to be considered a viable option for residential consumption. What is not known is if the water quality in the aquifer today is the same as it was when the wells were in service. For the purposes of this report, it is the only assumption that can be made until an actual test well is drilled.

3.5 Proposed Treatment Process Overview

Iron and Manganese

Next to hardness, the presence of iron is probably the most common water problem faced by well operators. Iron and manganese in excess of the suggested range usually results in discolored water, laundry, and plumbing fixtures, as well as taste and odor problems.

Well water from the faucet or tap is usually clear and colorless. However, when water containing colorless, dissolved iron is allowed to stand in a cooking container or comes in contact with a sink or bathtub, the iron combines with oxygen from the air to form reddish-brown particles (commonly

called rust). Manganese forms brownish-black particles. These impurities can give a metallic taste to water or to food.

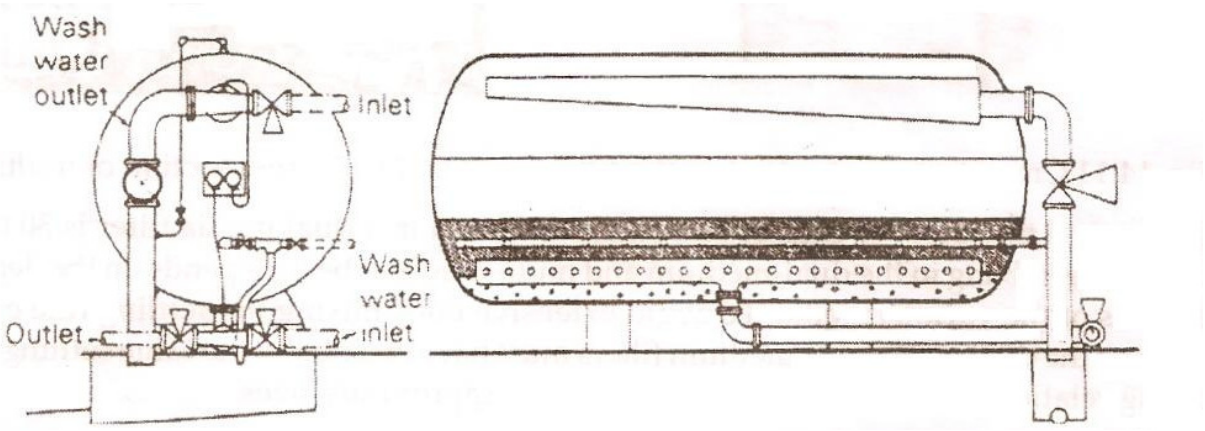
The rusty or brown stains on plumbing fixtures, fabrics, dishes, and utensils cannot be removed by soaps or detergents. Bleaches and alkaline builders (often sodium phosphate) can make the stains worse. Over time, iron deposits can build up in pressure tanks, water heaters, and pipelines, reducing the quantity and pressure of the water supply. There are three main forms of iron:

Iron Type	Characteristics	Treatment Method
Ferrous Iron	Often called "clear water iron" since it is not visible in poured water. It is found in water which contains no oxygen, such as water from deep wells or groundwater.	Ion exchange and Oxidation / filtration
Ferric Iron	Known as "red water iron". This type of iron is basically ferrous iron which has been exposed to oxygen (oxidized), usually from the air. These oxidized particles are generally visible in poured water.	Coagulation combined with filtration
Bacterial Iron	Ferrous iron which has been exposed to oxygen (oxidized), usually from the air. As carbon dioxide leave the water, oxygen combines with the iron to form ferric ions which are generally visible in poured water.	Chlorination, retention, filtration. Activated carbon is usually used as the filter material so the excess chlorine can also be removed.

Ion Exchange (Water Softening) involves the use of synthetic resins where an adsorbent (usually sodium) is exchanged for the unwanted ions in the water. One of the major difficulties in using this method for controlling iron and manganese is that if any oxidation of the media occurs during the process, the resulting precipitate can coat and foul the media.

Oxidation followed by **filtration** is often needed when the concentration of iron is relatively high, or when there is both dissolved and precipitated iron or manganese in the water. Oxidation followed by filtration is a relatively simple process. The oxidant chemically oxidizes the iron or manganese (forming a particle), and kills iron bacteria and any other disease-causing bacteria that may be present. The filter then removes the iron or manganese particles. Oxidation methods fall into two groups: those using additives like chlorine, ozone or air; or those using an oxidizing filter media (manganese greensand, birm or pyrolox). Each of these methods has their advantages and disadvantages.

For purposes of this report, filtration using a greensand horizontal pressure filter with aeration and chlorine injection to improve iron removal was used to estimate costs.



Typical Horizontal Pressure Filter

Unfortunately, filters have no effect on the TDS (total dissolved solids) or the hardness of water. Filtration was previously employed at Glenwood for iron and manganese removal. The existing equipment was installed in the 1970s.

For this application, filtration technology is the recommended approach to remove iron and manganese. Filtration can function as pretreatment for the additional advanced water treatment technology that can be used to remove hardness and TDS.

The **Reverse Osmosis (RO)** process is a membrane filtration process that is used for the removal of TDS from groundwater. In the RO process, raw water is pressurized and then forced though a membrane. Hardness and TDS will not penetrate through the membrane with the water, but will be rejected by the membrane, and then wasted to a sanitary sewer as a reject brine stream. Typical RO plants will waste 15-25% of the raw water as the reject brine stream. However, the RO process significantly removes water hardness having a removal efficiency that exceeds 90%.

The RO process has found widespread applications over the last 40 years, especially in potable water applications. Recent advances in the RO process include low-pressure membranes that allow energy savings because the process can operate economically at lower water pressures.

The RO process is the only water treatment process that is capable of improving the water quality of the Village's well water to the equivalent of Lake Michigan water once the actual water quality is known. If the Village wishes to explore this option to soften the water, a supplemental cost estimate can be performed.

Although water quality data that was on file from 1965 is being used, there is the potential for other contaminants to be present in the water supply that could alter the treatment method. Based on other Illinois municipalities that have both deep and shallow wells, those contaminants can include, arsenic, radium and vinyl chloride. All of these contaminants can be effectively treated with readily available and proven treatment technologies.

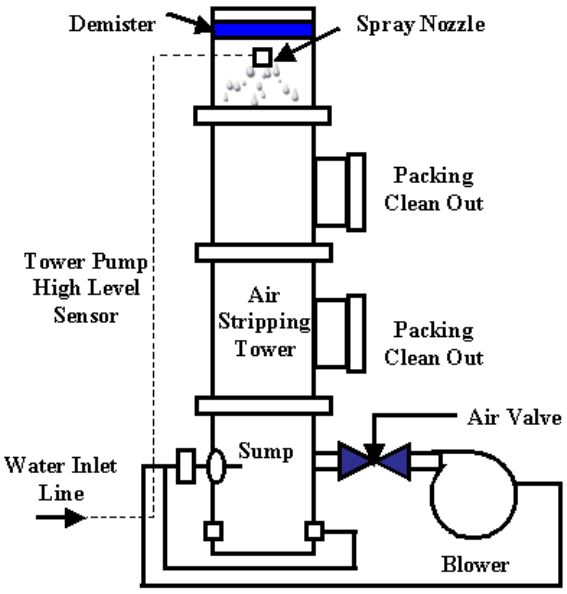
Arsenic

Arsenic naturally occurs in the environment as an odorless, tasteless, semi-metal element. It can get into drinking water supplies drawn from groundwater that contains arsenic from natural deposits in the earth or from agricultural and industrial practices. In January 2006, the United States Environmental Protection Agency lowered the acceptable limit for arsenic from 50 ppb (parts per billion) to 10 ppb, and arsenic water filtration applications had to comply with the new arsenic removal standards. Arsenic removal can be removed by aeration, conventional filtration, ion exchange, membrane filtration and separation, and separation and clarification.

Vinyl Chloride

A neighboring community has shallow wells that are currently contaminated with vinyl chloride which is a volatile organic compound that is regulated by the Illinois Environmental Protection Agency. Although we have no reason to believe this contamination could migrate to the Village of Glenwood, the possibility of this contaminant being in a shallow well in the Village does exist. Contamination of groundwater supplies with vinyl chloride is not uncommon and as a consequence neither is treatment for its removal. Ultraviolet oxidation and air stripping are two available treatment technologies for the removal of vinyl chloride.

Ultraviolet (UV) oxidation has been used hundreds of times to address the destruction of various organic chemical compounds such as vinyl chloride. Hydrogen peroxide is used in the process as a catalyst and reacts with the UV to break into hydroxyl radicals which in turn react with the contaminant, vinyl chloride. A rapid oxidative cascade of reactions follows until the contaminant is fully oxidized or until the reaction is halted by removing either the UV source or exhausting the hydrogen peroxide. With UV treatment, there are often considerable costs for pilot testing and hydrogen peroxide usage.



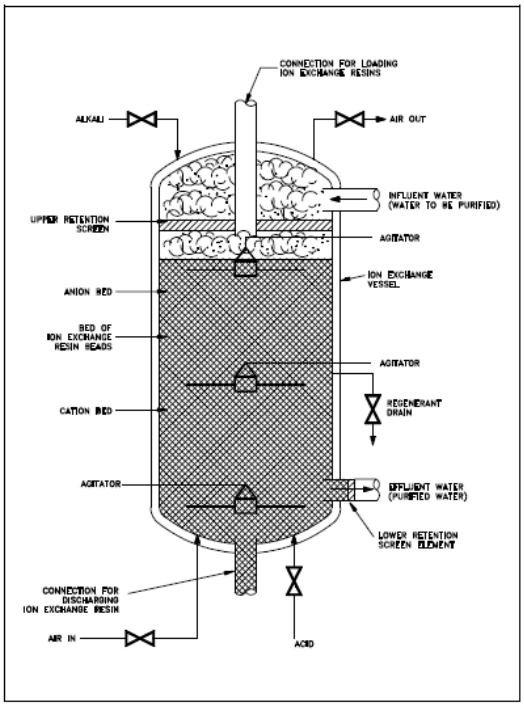
Air Stripping Tower

Air stripping is a process used to remove volatile compounds (usually organics) from groundwater. The basic concept of air stripping is to bring the contaminated water into contact with air so that the volatile compounds undergo a change from liquid phase to vapor phase.

An air stripper usually consists of a large tank filled with a packing material made of plastic, steel, or ceramic. The contaminated water is pumped into the tank and sprayed over the packing material. The water trickles down through the spaces between the packing materials toward the bottom of the tank. At the same time a fan at the bottom blows air upward. As the air passes upward through the trickling water, it causes the chemicals to evaporate.

Radium

In some Illinois communities, the deep wells contain radium which must be removed using a different treatment process. A number of treatment methods are available to remove radium from water. Ion exchange, lime softening, and reverse osmosis are the most common and can remove up to 90 percent of radium present. Ion exchange (i.e. water softeners) can often remove 90 percent of radium present along with water hardness. For some people, an undesired effect of ion exchange is the addition of sodium to the treated water. Reverse osmosis does not add sodium to the water.



Typical Ion Exchange

Radium was not regulated until 1976, so it is unclear if radium was not present in Glenwood's water supply or if it was simply not tested for in 1965. The file research shows no additional information on aquifer characteristics or indication that radium was an issue in Glenwood's wells.

Until a test well is drilled and water quality samples are taken, the final treatment process needed for a proposed well in the Village of Glenwood is unknown. For purposes of this report it is assumed the water quality will be near the same as it was for the previously existing wells within the Village and iron removal and softening will be needed as treatment.

4.0 Water Well Supply and Capacity

In order to adequately supply well water throughout the community, the Illinois Environmental Protection Agency requires that a community be able to provide firm capacity during a historical maximum day. Firm capacity is defined as the sum of all well supplies without the largest well supply in service. Maximum day is defined as the day of the year on which maximum amount of water is pumped. The maximum day normally occurs during a dry summer period when lawn sprinkling is at a maximum. A typical maximum day to average day ratio for suburban communities without large industrial demands is typically 1.8 to 2. The ratio will vary based on climate, rainfall and future development.

Using the 106 gallons per person usage rate based on the 2011 net annual pumpage of Lake Michigan water, the projected average day water demand for the Village of Glenwood in the year 2040 is 1.115 MGD and the conservative projected maximum day is twice that or 2.230 MGD.

Based on a projected maximum day of 2.230 MGD, the Village of Glenwood would need to be able to produce about 1550 gallons per minute (GPM) with the largest well out of service. Based on the historical records for the deep wells in Glenwood, we will assume that a deep well could produce a minimum of 800 GPM; therefore a total of three (3) deep wells producing at least 800 GPM will be needed to meet the firm capacity requirements.

5.0 Alternative Analysis

Two alternatives for utilizing locally sourced well water in Glenwood were evaluated. Variations of each alternative were considered to determine the most cost-effective approach. These are presented below and described more thoroughly in the following sections:

Alternative Scenario 1: Well Infrastructure Improvements with No Water Treatment

- *1A – Wells at Komer Booster Station Site Only*
- *1B – Wells at Komer Booster Station Site and Brookwood Point Booster Station Site*
- *1C – Well at the Komer Booster Station Site, Brookwood Point Booster Station Site and the Business Park*

Alternative Scenario 2: Well Infrastructure Improvements with Water Treatment - Iron Removal and Softening

- *2A – Construct a Treatment Plant and Wells at Komer Booster Station Site Only*
- *2B – Construct a Treatment Plant and Wells at Komer Booster Station Site and Brookwood Point Booster Station Site*
- *2C – Construct a Treatment Plant and Wells at Komer Booster Station Site, Brookwood Point Booster Station Site and the Business Park*

5.1 Alternative Scenario 1: Well Infrastructure Improvements with No Water Treatment

Alternative 1A – Wells at Komer Booster Station Site Only

For this option the Village would construct wells at the Komer Booster Station only for the well water to be distributed throughout the water distribution system similar to how it occurs today. The Komer Booster Station site is where Lake Michigan water is currently received from the transmission main.

The equipment needs for the facility would consist of: three deep wells capable of pumping at least 800 GPM each, associated piping and valves required to connect to the existing system; new building to house the well equipment, new motor control center, SCADA system upgrades; HVAC and dehumidification equipment as well as a new standby engine generator.

There is an abundance of open space in this area to situate a well; however, the major unknown would be the cost of transmitting the well water from the drilled well sites to the booster pump station. It is unlikely the wells would end up adjacent to each other on the same site.

The estimated cost for this alternative is $ 4,690,000. A detailed cost estimate is presented in Appendix 4.

Alternative 1B – Wells at Komer Booster Station Site and Brookwood Point Booster Station Site

For this option the Village would construct two deep wells at the Komer Booster Station and one deep well at the Brookwood Point Booster Station for the water to be distributed throughout the water distribution system.

The equipment needs for the facility would consist of: three wells capable of pumping at least 800 GPM each (two wells at Komer and one well at Brookwood Point), associated piping and valves required to connect to the existing system; two new buildings to house the well equipment at each booster pump station site, new motor control center, SCADA system upgrades; HVAC and dehumidification equipment as well as a new standby engine generator at each well site.

There is not an abundance of open space at Brookwood Point to site a well; the major unknown would be the cost of transmitting the well water from the drilled well sites to the booster pump stations. If a well is drilled near the Catholic Cemeteries property or in the school area, this cost could be relatively high. For the purposes of this report, it is assumed a site adjacent to the pump station will be used for the well and land acquisition costs are included.

The estimated cost for this alternative is $ 4,880,000. A detailed cost estimate is presented in Appendix 4.

Alternative 1C – Wells at Both Booster Station Sites and the Business Park

For this option the Village would construct a deep well at the Komer Booster Station, a deep well at the Brookwood Point Booster Station, and a deep well in the Business Park for the water to be distributed throughout the water distribution system.

Because the business park used to be primarily industrial in nature, the well placement at this location would need to be carefully analyzed for the appropriate setback and well head protection requirements as mandated by the Environmental Protection Agency. Because the Business Park area has larger diameter mains, there is a possibility the well could pump directly into the distribution system if it is set at the correct hydraulic grade and is interconnected with the Village's SCADA system.

The equipment needs for the facility would consist of: three deep wells capable of pumping at least 800 GPM each, associated piping and valves required to connect to the existing system; three new buildings to house the well equipment at each well site, new motor control center, SCADA system upgrades; HVAC and dehumidification equipment as well as a new standby engine generator at each well site.

The estimated cost for this alternative is $ 5,090,000. A detailed cost estimate is presented in Appendix 4.

5.1.1 Alternative Scenario 1 Cost Summary

The following table summarizes the estimated costs for the various alternatives for providing three deep wells without treatment.

Well Infrastructure Improvements with No Water Treatment	Total Capital Cost	Total O&M Cost ($/1,000 gal)	Total Cost ($/1,000 gal)
1A - Wells at Komer Booster Station Site Only	$4,690,000	$0.90	$1.94
1B - Wells at Komer Booster Station Site and Brookwood Point Booster Station Site	$4,880,000	$0.90	$1.98
1C - Wells at Both Booster Station Sites and the Business Park	$5,090,000	$0.90	$2.03

Assuming a debt repayment of 5% over a 20-year period, an annual debt repayment was calculated and then converted to a cost per 1,000 gallons.

5.2 Alternative Scenario 2: Well Infrastructure Improvements with Water Treatment - Iron Removal and Softening

Alternatives were investigated and evaluated in order to develop groundwater treatment facilities. The alternatives included construction of groundwater treatment plants to serve each well site and construction of a centralized ground-water treatment plant.

Alternative 2A – Construct Wells and Treatment Plant at Komer Booster Station Site Only

For this option the Village would construct wells and a centralized water treatment plant at the Komer Booster Station only for the water to be distributed throughout the water distribution system.

The equipment needs for the facility would consist of a central treatment plant to house iron removal and softening equipment as well as the wells, associated piping and valves required to connect to the existing system, water treatment plant equipment, new motor control center, SCADA system upgrades; HVAC and dehumidification equipment as well as a standby engine generator.

There is plenty of open space in this area to site wells and water treatment plant; however, the major unknown would be the cost of transmitting the treated well water from the water treatment

plant site to the booster pump station. In addition, the soils in this area may be problematic where there is floodplain as well as bedrock in the area that could make construction difficult and must be considered when siting the water treatment plant.

The estimated cost for this alternative is $ 9,460,000. A detailed cost estimate is presented in Appendix 5.

Therefore, this alternative is eliminated from consideration.

Alternative 2B – Construct Wells and Treatment Plant at Komer Booster Station Site and Brookwood Point Booster Station Site

For this option the Village would construct a treatment plant at the Komer Booster Station site and the Brookwood Point Booster station site.

The equipment needs for the facility would consist of two separate treatment plant to house iron removal and softening equipment as well as the well or wells at each site, associated piping and valves required to connect to the existing system, water treatment plant equipment, new motor control center, SCADA system upgrades; HVAC and dehumidification equipment as well as a standby engine generator.

There is not a significant amount of open space in this area to situate a water treatment plant; therefore land acquisition costs are included in the estimate.

The estimated cost for this alternative is $ 10,060,000. A detailed cost estimate is presented in Appendix 4.

Alternative 2C – Construct Wells and Treatment Plant at Both Booster Station Sites and the Business Park Well in the Business Park

For this option the Village would construct a treatment plant at all three separate well sites.

The equipment needs for the facility would consist of three separate treatment plants to house iron removal and softening equipment and the well or wells at each site, associated piping and valves required to connect to the existing system, water treatment plant equipment, new motor control center, SCADA system upgrades; HVAC and dehumidification equipment as well as a standby engine generator.

The estimated cost for this alternative is $ 14,020,000. A detailed cost estimate is presented in Appendix 5.

5.2.1 Alternative Scenario 2 Cost Summary

The following table summarizes the costs for treating the water to Lake Michigan water quality identified above.

Well Infrastructure Improvements with Water Treatment- Iron Removal and Softening	Total Capital Cost	Total O&M Cost ($/1,000 gal)	Total Cost ($/1,000 gal)
2A - Construct Wells and Treatment Plant at Komer Booster Station Site Only	$9,460,000	$0.90	$3.00
2B - Construct Wells and Treatment Plant at Komer Booster Station Site and Brookwood Point Booster Station Site	$10,600,000	$0.90	$3.25
2C - Construct Wells and Treatment Plant at Both Booster Station Sites and the Business Park	$14,020,000	$0.90	$4.01

Assuming a debt repayment of 5% over a 20-year period, an annual debt repayment was calculated and then converted to a cost per 1,000 gallons.

6.0 Conclusions

This report contains information the Village of Glenwood can use in order to evaluate the cost effectiveness of remaining with Lake Michigan water.

That being said, things like resident dissatisfaction with water quality, challenges to individual plumbing fixtures with untreated water, and training of current staff to accommodate new treatment technologies were not analyzed in this report as they are difficult to quantify until the well and pump sizes, new facility location and water quality are identified.

If the Village chooses to aggressively pursue a locally sourced well water alternative, we recommend the Village commission a well siting study. In this study the regional geology and hydrogeology of the area will be studied by a hydrogeologist who will consider geologic formations and their properties to identify potential fracture traces. These linear features in fractured bedrock often represent zones of higher permeability. Fracture zones are potential pathways for enhanced movement in ground water, and wells drilled on those fracture traces are often more productive wells. In addition to the fracture trace analysis (FTA), an environmental analysis that will be used in conjunction with the FTA to identify potential well sites

should be conducted. With this information the Village will be able to prioritize and locate potential well sites for test drilling in order to determine volume and quality of water. The estimated cost for an FTA for the entire Village and proposed planning area is about $12,000. If a smaller area is identified, these costs will decrease.

Once these potential well sites are determined from the FTA, the Village can review these areas from a logistical stand point such as:

1. The likelihood of annexation into the Village of Glenwood and becoming part of the Facility Planning Area
2. The proximity to existing adequately sized water distribution mains to decrease the capital cost of construction
3. Land availability and acquisition costs
4. Environmental impact analysis of selected sites

Once it is determined which sites can be pursued further from a logistical standpoint, the Village has a choice to do the following:

1. Continue the investigation with geophysical surveying of the selected sites at an estimated cost of $25,000 per site
2. Proceed with test wells at the selected sites. The estimated cost for a test well will vary per site.

Drilling a test well will require drilling equipment and some construction in order to be able to test pump the well to determine well volume as well as water quality characteristics. This will require permission for access from the current property owner. With this pumpage data and the water quality tests, more refined cost estimates can be developed as well as the preferred water treatment method necessary.

Appendix 1

CMAP Population Projections

Illinois Department of Natural Resources LMO2 2010 Summary

Illinois Department of Natural Resources LMO2 2011 Summary

IDNR Lake Michigan Water Allocation Summary

Robinson ENGINEERING 75

Municipal Expertise. Community Commitment.

Chicago Metropolitan Agency for Planning

Worksheets	
by County	2010 Census, 2010 Previous Estimate & 2040 data summarized by county
by MCD	2010 Census, 2010 Previous Estimate & 2040 data summarized by Minor Civil Division (Political Townships)
by Municipality	2010 Census, 2010 Previous Estimate & 2040 data summarized by Municpality, includes a record for the unincorporated portion of each county, highlighted in red. ***Municipal summaries are approximate and follow quartersection (subzone) boundaries.*** Refer to map to see how they line up.

A note concerning township (MCD) and municipal summaries:

Aggregation of forecast data to the municipal and township level was created through a GIS-based exercise, where whole subzones were assigned to municipalities and townships based on the proximity of each subzone's central point (centroid) to current municipality/township boundaries. Therefore, these summaries do not exactly account for population residing within existing municipal boundaries; they are approximate. Refer to the PDF maps available on the CMAP website for depictions of "assigned" municipal and township boundaries used to generate these summaries. These subzone aggregations were created for tabulation purposes only, and are not intended to suggest or predict the future extent of any community.

Link to map Municipal subzone assignment map (PDF, 7 MB)
Link to map Township subzone assignment map (PDF, 6 MB)

Variables	
2010 Census, Summarized to Subzone	
HH10	2010 Census households
PHH10	2010 Census population in households
PNGQ10	2010 Census population in group quarters
EMP10	Current total employment (2012 update)
RET10	Current retail employment (2012 update)
2010 Pre-Census Estimates Used as Forecast Base	
HH10_FB	2010 households as ESTIMATED in 2010 and used as basis for 2040 Projections
PHH10_FB	2010 population in households as ESTIMATED in 2010 and used as basis for 2040 Projections
PNGQ10_FB	2010 population in group quarters as ESTIMATED and used as basis for 2040 Projections
EMP10_FB	2010 total employment as ESTIMATED in 2010 and used as basis for 2040 Projections
RET10_FB	2010 retail employment as ESTIMATED in 2010 and used as basis for 2040 Projections
2040 Forecast	
HH40	2040 households
PHH40	2040 population in households
PNGQ40	2040 population in group quarters
EMP40	2040 employment
RET40	2040 retail employment

Questions? Contact David C. Clark
DCClark@cmap.illinois.gov
Sepember 10,2012

	2010 Census				2010 Pre-Census Estimates Used as Forecast Base				2040 Forecast			
Municipality	**HH10**	**PHH10**	**PNGQ10**	**EMP10**	**HH10_FB**	**PHH10_FB**	**PNGQ10_FB**	**EMP10_FB**	**HH40**	**PHH40**	**PNGQ40**	**EMP40**
Des Plaines	27,178	69,683	68	44,124	24,881	65,133	251	46,767	29,394	79,389	186	47,004
Diamond	31	90	-	37	7	21	-	-	57	174	-	16
Dixmoor	1,349	4,282	-	708	1,653	4,200	-	452	2,018	5,306	-	878
Dolton	7,712	22,743	17	3,841	7,427	22,578	-	2,883	9,396	27,560	-	3,677
Downers Grove	22,414	55,607	372	49,397	22,910	59,282	352	52,637	29,670	76,822	278	70,921
East Dundee	1,257	3,298	-	5,207	1,964	5,232	-	6,834	3,383	9,154	-	8,216
East Hazel Crest	621	1,599	-	949	560	1,472	21	1,131	587	1,516	83	1,535
Elburn	2,113	6,197	-	1,231	2,014	5,729	8	1,801	4,471	12,620	8	3,106
Elgin	37,729	113,250	956	54,742	40,157	117,885	772	54,815	57,097	168,207	909	90,283
Elk Grove Village	14,568	36,080	36	53,446	13,651	36,028	57	68,544	15,598	41,745	28	95,654
Elmhurst	16,334	44,380	929	30,679	16,803	44,729	774	37,229	21,392	57,840	855	37,686
Elmwood Park	8,496	22,085	2	3,386	8,004	20,359	3	2,621	8,923	22,507	-	2,630
Elwood	933	2,411	-	1,515	867	2,333	-	448	1,918	4,960	-	19,026
Evanston	30,234	68,322	5,727	55,594	32,181	71,301	6,764	42,530	37,332	83,057	7,915	42,695
Evergreen Park	7,285	19,916	7	8,179	6,802	18,744	40	9,255	8,194	21,815	67	9,959
Flossmoor	3,389	9,240	19	3,175	2,916	8,272	-	3,371	3,940	11,097	-	3,619
Ford Heights	639	2,517	-	340	988	3,439	-	350	1,456	4,809	-	1,263
Forest Park	7,159	13,992	19	7,260	6,980	14,509	10	15,462	7,954	16,669	14	16,867
Forest View	1,551	4,874	8	2,469	1,485	4,108	-	2,297	1,677	4,608	-	2,516
Fox Lake	6,556	15,170	-	3,610	5,580	13,777	3	4,432	7,257	18,063	-	5,175
Fox River Grove	1,764	4,775	-	979	2,005	5,761	9	1,160	2,495	6,913	6	1,561
Frankfort	7,597	22,523	35	11,458	8,303	25,646	44	12,423	18,002	54,907	37	24,788
Franklin Park	6,163	18,921	17	18,053	6,120	18,390	22	18,420	6,972	21,817	22	18,627
Geneva	8,391	23,032	52	15,237	9,397	26,151	28	17,137	12,860	34,654	38	20,185
Gilberts	2,222	6,908	-	993	1,839	5,584	-	1,915	4,717	14,106	-	5,059
Glen Ellyn	12,702	33,116	5	18,313	12,537	33,042	88	22,928	14,710	38,489	94	23,359
Glencoe	2,954	8,430	4	2,501	3,088	8,891	3	3,141	3,810	11,078	3	3,230
Glendale Heights	12,191	36,840	1	10,574	11,718	35,030	13	11,143	13,310	41,162	-	12,216
Glenview	21,344	55,690	33	34,825	20,718	55,298	232	43,925	26,349	73,270	280	50,203
Glenwood	3,407	9,293	188	2,281	3,135	8,851	-	2,022	3,803	10,521	-	5,152
Godley	193	552	-	3	259	715	-	1	260	706	-	1
Golf	211	625	33	1	241	667	-	4	247	683	-	4
Grayslake	8,012	21,521	15	8,635	9,205	26,358	3	10,348	12,669	35,964	-	22,361
Green Oaks	1,673	5,338	152	5,664	2,162	5,879	76	7,084	2,514	6,923	141	7,521
Greenwood	135	389	-	56	501	1,545	1	94	1,668	4,867	2	971
Gurnee	14,603	39,455	48	17,649	14,397	40,296	57	20,156	17,516	49,201	54	28,130
Hainesville	1,454	4,445	8	202	1,452	4,708	9	442	2,197	6,800	9	1,046
Hampshire	2,193	6,246	-	2,740	2,685	7,338	-	3,865	4,713	13,042	-	8,463
Hanover Park	11,291	38,669	-	7,302	11,809	38,806	40	10,479	13,688	45,305	40	12,996
Harvard	3,238	9,954	-	2,485	3,861	11,283	16	3,107	6,383	18,964	16	4,839
Harvey	6,660	20,758	60	8,509	7,234	23,643	235	9,627	8,803	28,227	371	10,650
Harwood Heights	3,059	7,533	2	6,738	3,361	7,807	4	8,858	3,793	8,901	1	9,098
Hawthorn Woods	3,624	10,797	-	2,041	3,388	10,834	104	2,457	3,989	12,602	99	3,099
Hazel Crest	5,242	14,743	21	5,087	5,142	14,983	-	3,366	6,369	18,113	-	3,812
Hebron	514	1,333	28	452	488	1,325	-	662	710	1,885	-	663
Hickory Hills	6,187	16,600	15	2,967	5,913	16,031	5	2,523	7,072	18,904	5	3,000
Highland Park	11,063	28,754	72	15,129	11,454	30,862	227	21,424	16,955	46,507	347	21,613
Highwood	1,894	5,578	5	1,249	2,136	5,769	6	1,738	2,408	6,952	6	1,803
Hillside	2,517	6,871	4	4,866	2,430	6,510	11	4,311	2,939	8,187	2	6,039
Hinsdale	6,076	18,269	76	13,209	6,548	18,811	61	16,372	7,975	22,912	70	16,373
Hodgkins	894	2,191	-	11,623	1,012	2,518	-	4,894	1,407	3,483	-	6,235
Hoffman Estates	19,076	52,344	263	27,694	16,968	48,533	-	19,412	20,976	60,189	-	32,467
Holiday Hills	547	1,341	-	58	535	1,543	-	86	612	1,782	-	122
Homer Glen	8,690	26,153	30	4,542	8,925	29,062	9	5,339	17,224	54,592	6	11,501
Hometown	1,995	4,580	4	401	1,896	4,418	-	294	2,284	4,990	-	327

Water Year 2010: Lake Michigan Water Allocation, Pumpage, and Unaccounted-For-Flow Summary

System Name	Allocation (mgd)	Net Annual Pumpage (mgd)	% Net Annual Pumpage To Allocation	Net Annual Lake Pumpage (mgd)	Unaccounted For Flow (mgd)	% Unaccounted For Flow To Net Annual Pumpage
Addison	4.230	3.315	78.4	3.315	0.013	0.4
Alsip	4.332	3.596	83.0	3.596	0.093	2.6
Arlington Heights	9.596	8.310	86.6	8.310	0.393	4.7
Bannockburn	0.369	0.345	93.5	0.345	0.034	9.9
Beach Park	0.983	0.425	43.2	0.425	0.000	0.0
Bedford Park	12.561	10.120	80.6	10.120	0.937	9.3
Bellwood	2.100	1.798	85.6	1.798	0.085	4.7
Bensenville	2.571	2.230	86.7	2.230	0.409	18.3
Berkeley	0.831	0.718	86.4	0.718	0.058	8.1
Berwyn	6.103	5.370	88.0	5.370	0.005	0.1
Bloomingdale	2.767	2.196	79.4	2.196	0.030	1.3
Blue Island	2.794	2.356	84.3	2.356	0.130	5.5
Bombardier Motor Corporation of America	0.020	0.010	50.0	0.010	0.000	0.0
Bridgeview	2.482	2.000	80.6	2.000	0.116	5.8
Broadview	1.473	1.058	71.8	1.058	0.073	6.9
Brookfield	2.188	2.005	91.6	2.005	0.177	8.8
Buffalo Grove	4.783	4.297	89.8	4.297	0.320	7.5
Burnham	0.496	0.519	104.6	0.519	0.025	4.7
Burr Ridge	2.165	1.783	82.4	1.783	0.078	4.4
Calumet City	4.902	3.914	79.8	3.914	0.083	2.1
Calumet Park	1.014	0.830	81.9	0.830	0.114	13.7
Carol Stream	4.213	3.290	78.1	3.290	0.018	0.6
Central Lake County Joint Action Water Agency	0.100	0.301	301.0	0.301	0.000	0.0
Central Stickney Sanitary District	0.196	0.157	80.3	0.157	0.000	0.0
Chicago	594.387	482.017	81.1	482.017	11.262	2.3

Water Year 2010: Lake Michigan Water Allocation, Pumpage, and Unaccounted-For-Flow Summary

System Name	Allocation (mgd)	Net Annual Pumpage (mgd)	% Net Annual Pumpage To Allocation	Net Annual Lake Pumpage (mgd)	Unaccounted For Flow (mgd)	% Unaccounted For Flow To Net Annual Pumpage
Chicago Heights	5.814	5.817	100.1	5.817	0.876	15.1
Chicago Ridge	1.523	1.303	85.6	1.303	0.057	4.4
Cicero	7.313	7.335	100.3	7.335	0.369	5.0
Clarendon Hills	0.832	0.704	84.6	0.704	0.000	0.0
Country Club Hills	1.447	1.204	83.2	1.204	0.001	0.1
Countryside	0.978	0.951	97.2	0.951	0.050	5.3
Crestwood	1.394	1.221	87.6	1.221	0.056	4.5
Darien	2.934	2.400	81.8	2.400	0.191	7.9
Deerfield	2.917	2.535	86.9	2.535	0.204	8.1
Delmar Woods Water Company	0.022	0.017	77.3	0.017	0.000	0.0
Des Plaines	7.928	6.294	79.4	6.294	0.561	8.9
Dixmoor	0.629	0.514	81.7	0.514	0.012	2.4
Dolton	3.141	1.720	54.8	1.720	0.005	0.3
Downers Grove	6.589	5.411	82.1	5.411	0.181	3.3
DuPage-Glen Ellyn Heights	0.210	0.199	94.8	0.101	0.006	2.8
DuPage-Hobson Valley	0.051	0.070	137.3	0.041	0.001	0.8
DuPage-Southeast	0.643	0.592	92.1	0.592	0.000	0.0
DuPage-Steeple Run	0.183	0.161	88.0	0.000	0.012	7.5
East Hazel Crest	0.205	0.184	89.8	0.184	0.011	6.2
Elk Grove Village	7.703	4.993	64.8	4.993	0.143	2.9
Elmhurst	4.699	4.086	87.0	4.086	0.194	4.7
Elmwood Park	2.810	2.000	71.2	2.000	0.103	5.2
Evanston	9.344	7.574	81.1	7.574	0.198	2.6
Evergreen Park	2.643	2.268	85.8	2.268	0.363	16.0
Flossmoor	1.191	1.102	92.5	1.102	0.080	7.2
Ford Heights	0.385	0.532	138.2	0.532	0.055	10.2
Forest Park	2.125	1.732	81.5	1.732	0.122	7.1

Water Year 2010: Lake Michigan Water Allocation, Pumpage, and Unaccounted-For-Flow Summary

System Name	Allocation (mgd)	Net Annual Pumpage (mgd)	% Net Annual Pumpage To Allocation	Net Annual Lake Pumpage (mgd)	Unaccounted For Flow (mgd)	% Unaccounted For Flow To Net Annual Pumpage
Forest View	0.156	0.134	85.9	0.134	0.004	2.8
Franklin Park	4.994	3.223	64.5	3.223	0.227	7.0
Garden Homes Sanitary District	0.086	0.063	73.3	0.063	0.000	0.0
Glen Ellyn	2.985	2.724	91.3	2.724	0.167	6.1
Glenbrook Sanitary District	0.140	0.113	80.7	0.113	0.000	0.0
Glencoe	1.880	1.488	79.1	1.488	0.095	6.4
Glendale Heights	2.869	2.498	87.1	2.498	0.120	4.8
Glenview	10.810	8.725	80.7	8.725	0.654	7.5
Glenwood	1.138	0.930	81.7	0.930	0.000	0.0
Golf	0.086	0.060	69.8	0.060	0.004	6.5
Grayslake	1.780	1.414	79.4	1.414	0.060	4.2
Green Oaks	0.281	0.133	47.3	0.133	0.001	0.6
Gurnee	4.516	3.750	83.0	3.750	0.000	0.0
Hanover Park	3.066	2.665	86.9	2.594	0.000	0.0
Harvey	4.027	3.264	81.1	3.264	0.294	9.0
Harwood Heights	0.962	0.823	85.6	0.823	0.041	5.0
Hazel Crest	1.539	1.308	85.0	1.308	0.104	7.9
Hickory Hills	1.400	1.180	84.3	1.180	0.065	5.5
Highland Park	5.705	5.178	90.8	5.178	0.501	9.7
Highwood	0.654	0.641	98.0	0.641	0.042	6.5
Hillside	1.224	0.980	80.1	0.980	0.138	14.1
Hinsdale	2.762	2.454	88.8	2.454	0.143	5.8
Hodgkins	0.634	0.495	78.0	0.495	0.005	1.0
Hoffman Estates	6.101	4.984	81.7	4.984	0.254	5.1
Hometown	0.430	0.360	83.7	0.360	0.023	6.4
Homewood	1.980	1.630	82.3	1.630	0.078	4.8
Illinois American Water Company - Alpine	0.065	0.047	72.3	0.047	0.000	0.0

Water Year 2010: Lake Michigan Water Allocation, Pumpage, and Unaccounted-For-Flow Summary

System Name	Allocation (mgd)	Net Annual Pumpage (mgd)	% Net Annual Pumpage To Allocation	Net Annual Lake Pumpage (mgd)	Unaccounted For Flow (mgd)	% Unaccounted For Flow To Net Annual Pumpage
Illinois American Water Company - Arbury	0.167	0.143	85.6	0.000	0.005	3.8
Illinois American Water Company - Arrowhead	0.190	0.139	73.2	0.139	0.000	0.0
Illinois American Water Company - Chicago Suburban	1.958	1.753	89.5	1.753	0.102	5.8
Illinois American Water Company - Country Club Highland	0.105	0.087	82.9	0.087	0.000	0.0
Illinois American Water Company - Derby Meadows	2.543	1.828	71.9	1.828	0.041	2.3
Illinois American Water Company - DuPage Utility	0.555	0.474	85.4	0.474	0.012	2.5
Illinois American Water Company - Fernway	0.591	0.501	84.8	0.501	0.000	0.0
Illinois American Water Company - Liberty Ridge East	0.042	0.023	54.8	0.023	0.000	0.0
Illinois American Water Company - Liberty Ridge West	0.305	0.247	81.0	0.247	0.000	0.0
Illinois American Water Company - Lombard Heights	0.065	0.047	72.3	0.047	0.000	0.0
Illinois American Water Company - Moreland	0.064	0.051	79.7	0.051	0.000	0.6
Illinois American Water Company - Valley View	0.700	0.549	78.4	0.549	0.008	1.5
Illinois American Water Company - Waycinden	0.705	0.469	66.5	0.469	0.019	4.0
Illinois American Water Company -West Suburban/Santa Fe	6.934	6.190	89.3	6.190	0.271	4.4
Illinois Beach State Park	0.080	0.093	116.3	0.093	0.000	0.0
Indian Head Park	0.336	0.268	79.8	0.264	0.007	2.5
Itasca	1.666	1.280	76.8	1.280	0.072	5.7
John G. Shedd Aquarium	0.023	0.013	55.2	0.013	0.000	0.0
Justice	1.497	1.258	84.0	1.258	0.047	3.7
Kenilworth	0.482	0.382	79.3	0.382	0.031	8.2
La Grange	1.915	1.573	82.1	1.573	0.220	14.0
La Grange Park	1.270	1.142	89.9	1.142	0.020	1.7
LaGrange Highlands Sanitary District	0.623	0.470	75.4	0.470	0.012	2.5
Lake Bluff	0.820	0.603	73.5	0.603	0.053	8.7
Lake County - Knollwood-Rondout	0.716	0.634	88.5	0.634	0.005	0.7
Lake County - Vernon Hills	3.081	2.749	89.2	2.749	0.179	6.5
Lake County - Wildwood	1.211	1.050	86.7	1.050	0.013	1.2

Water Year 2010: Lake Michigan Water Allocation, Pumpage, and Unaccounted-For-Flow Summary

System Name	Allocation (mgd)	Net Annual Pumpage (mgd)	% Net Annual Pumpage To Allocation	Net Annual Lake Pumpage (mgd)	Unaccounted For Flow (mgd)	% Unaccounted For Flow To Net Annual Pumpage
Lake County Public Water District	0.075	0.080	106.7	0.080	0.000	0.0
Lake Forest	4.408	3.581	81.2	3.581	0.243	6.8
Lansing	3.925	3.207	81.7	3.207	0.213	6.6
Leyden	0.959	0.821	85.6	0.821	0.046	5.6
Libertyville	2.962	2.570	86.8	2.570	0.206	8.0
Lincolnshire	1.533	1.262	82.3	1.262	0.035	2.8
Lincolnwood	2.324	1.809	77.8	1.809	0.004	0.2
Lisle	3.024	2.316	76.6	2.316	0.024	1.0
Lockport	3.443	2.660	77.3	0.000	0.401	15.1
Lombard	4.770	3.978	83.4	3.978	0.183	4.6
Loyola University Medical Center	0.520	0.457	87.9	0.457	0.000	0.0
Lynwood	1.089	0.671	61.6	0.671	0.001	0.1
Lyons	1.025	1.115	108.8	1.115	0.284	25.4
Madden Health Center	0.040	0.020	49.3	0.020	0.000	0.0
Markham	1.390	1.320	95.0	1.320	0.291	22.1
Matteson	2.209	1.713	77.5	1.713	0.000	0.0
Maywood	3.396	3.000	88.3	3.000	0.187	6.2
McCook	1.638	1.010	61.6	1.010	0.251	24.9
Melrose Park	3.910	3.749	95.9	3.749	0.280	7.5
Merrionette Park	0.233	0.185	79.4	0.185	0.011	5.8
Midlothian	1.594	1.348	84.6	1.348	0.180	13.4
Mission Brook Sanitary District	0.275	0.204	74.2	0.204	0.005	2.5
Mokena	2.293	1.674	73.0	1.674	0.000	0.0
Morton Grove	3.399	2.709	79.7	2.709	0.203	7.5
Mount Prospect	4.477	3.597	80.3	3.597	0.105	2.9
Mundelein	2.916	2.484	85.2	2.484	0.000	0.0
Naperville	18.803	15.276	81.2	15.276	0.579	3.8

Water Year 2010: Lake Michigan Water Allocation, Pumpage, and Unaccounted-For-Flow Summary

System Name	Allocation (mgd)	Net Annual Pumpage (mgd)	% Net Annual Pumpage To Allocation	Net Annual Lake Pumpage (mgd)	Unaccounted For Flow (mgd)	% Unaccounted For Flow To Net Annual Pumpage
New Lenox	2.594	2.023	78.0	2.023	0.105	5.2
Niles	4.932	4.576	92.8	4.576	0.826	18.1
Norridge	1.914	1.472	76.9	1.472	0.105	7.1
North Chicago	4.979	3.400	68.3	3.400	0.000	0.0
North Riverside	1.005	0.990	98.5	0.990	0.079	8.0
Northbrook	6.002	5.130	85.5	5.130	0.316	6.2
Northfield	1.053	1.045	99.2	1.045	0.206	19.7
Northlake	2.889	2.123	73.5	2.123	0.099	4.6
Oak Brook	4.205	3.004	71.4	2.997	0.095	3.1
Oak Forest	2.981	2.486	83.4	2.486	0.145	5.8
Oak Forest Hospital	0.300	0.311	103.7	0.311	0.000	0.0
Oak Lawn	7.082	5.701	80.5	5.701	0.370	6.5
Oak Park	5.881	5.287	89.9	5.287	0.026	0.5
Oakbrook Terrace	0.281	0.179	63.7	0.179	0.018	10.1
Olympia Fields	0.828	0.568	68.6	0.568	0.000	0.1
Orland Park	8.099	6.853	84.6	6.853	0.365	5.3
Palatine	7.807	6.499	83.2	6.499	0.000	0.0
Palos Heights	2.043	1.677	82.1	1.677	0.075	4.5
Palos Hills	1.967	1.557	79.2	1.557	0.034	2.2
Palos Park	0.572	0.447	78.1	0.447	0.000	0.0
Park City	0.593	0.501	84.5	0.501	0.004	0.9
Park Ridge	4.898	4.409	90.0	4.409	0.436	9.9
Phoenix	0.198	0.140	70.7	0.140	0.000	0.0
Plainfield	5.950	3.025	50.8	3.025	0.000	0.0
Posen	0.495	0.430	86.9	0.430	0.001	0.2
Prospect Heights	0.407	0.160	39.3	0.160	0.010	6.2
River Forest	1.635	1.342	82.1	1.342	0.115	8.6

Water Year 2010: Lake Michigan Water Allocation, Pumpage, and Unaccounted-For-Flow Summary

System Name	Allocation (mgd)	Net Annual Pumpage (mgd)	% Net Annual Pumpage To Allocation	Net Annual Lake Pumpage (mgd)	Unaccounted For Flow (mgd)	% Unaccounted For Flow To Net Annual Pumpage
River Grove	1.268	1.032	81.4	1.032	0.126	12.3
Riverdale	1.622	1.677	103.4	1.677	0.013	0.8
Riverside	0.985	0.728	73.9	0.728	0.003	0.4
Riverwoods	0.528	0.392	74.2	0.392	0.004	1.0
Robbins	1.755	1.600	91.2	1.600	0.167	10.4
Rolling Meadows	3.019	2.301	76.2	2.299	0.053	2.3
Rosalind Franklin University	0.024	0.017	70.8	0.017	0.000	0.0
Roselle	2.206	1.731	78.5	1.731	0.005	0.3
Rosemont	2.414	1.525	63.2	1.525	0.095	6.2
Round Lake	1.753	1.136	64.8	1.136	0.039	3.4
Round Lake Beach	2.128	1.814	85.2	1.814	0.154	8.5
Round Lake Heights	0.201	0.156	77.6	0.156	0.005	3.3
Round Lake Park	0.418	0.329	78.7	0.329	0.024	7.3
Schaumburg	10.500	8.536	81.3	8.536	0.095	1.1
Schiller Park	2.167	1.477	68.2	1.477	0.000	0.0
Shorewood	1.748	1.250	71.5	0.000	0.047	3.8
Skokie	10.283	7.948	77.3	7.948	0.626	7.9
South Chicago Heights	0.527	0.357	67.7	0.357	0.000	0.0
South Holland	2.816	2.876	102.1	2.876	0.216	7.5
South Palos Township	0.130	0.104	80.0	0.104	0.000	0.0
South Stickney Sanitary District	2.940	2.820	95.9	2.820	0.217	7.7
Stickney	1.356	1.540	113.6	1.540	0.071	4.6
Stone Park	0.381	0.370	97.1	0.370	0.000	0.0
Streamwood	3.548	3.130	88.2	3.130	0.078	2.5
Summit	1.211	1.074	88.7	1.074	0.032	3.0
Thornton	0.285	0.334	117.2	0.334	0.027	8.2
Tinley Park	6.572	5.400	82.2	5.400	0.000	0.0

Water Year 2010: Lake Michigan Water Allocation, Pumpage, and Unaccounted-For-Flow Summary

System Name	Allocation (mgd)	Net Annual Pumpage (mgd)	% Net Annual Pumpage To Allocation	Net Annual Lake Pumpage (mgd)	Unaccounted For Flow (mgd)	% Unaccounted For Flow To Net Annual Pumpage
Villa Park	2.146	1.733	80.8	1.733	0.011	0.6
Waukegan	8.897	7.408	83.3	7.408	0.381	5.1
Westchester	2.100	1.656	78.9	1.656	0.186	11.3
Westmont	2.945	2.367	80.4	2.367	0.017	0.7
Wheaton	5.821	4.616	79.3	4.616	0.000	0.0
Wheeling	5.153	4.200	81.5	4.200	0.615	14.6
Willow Springs	0.658	0.551	83.7	0.551	0.006	1.1
Willowbrook	1.267	1.005	79.3	1.005	0.011	1.1
Wilmette	3.866	3.208	83.0	3.208	0.409	12.7
Winfield	1.011	0.826	81.7	0.826	0.000	0.0
Winnetka	2.548	2.521	98.9	2.521	0.479	19.0
Winthrop Harbor	0.604	0.460	76.2	0.460	0.012	2.6
Wood Dale	1.613	1.214	75.3	1.214	0.048	4.0
Woodridge	3.876	2.842	73.3	2.842	0.123	4.3
Worth	1.106	0.977	88.3	0.977	0.087	8.9
Zion	2.509	2.101	83.7	2.101	0.095	4.5
Sum	**1101.348**	**898.648**		**894.222**	**34.172**	
Average	**5.425**	**4.427**	**83.229**	**4.405**	**0.168**	**4.758**

Water Year 2011: Lake Michigan Water Allocation, Pumpage, and Unaccounted-For-Flow Summary

System Name	Allocation (mgd)	Net Annual Pumpage (mgd)	% Net Annual Pumpage To Allocation	Net Annual Lake Pumpage (mgd)	Unaccounted For Flow (mgd)	% Unaccounted For Flow To Net Annual Pumpage
Addison	4.252	3.508	82.5	3.508	0.130	3.7
Alsip	4.356	3.474	79.7	3.474	0.127	3.7
Antioch	0.000	1.179	0.0	0.000	0.062	5.3
Arlington Heights	9.626	7.890	82.0	7.890	0.124	1.6
Bannockburn	0.370	0.326	88.1	0.326	0.016	4.9
Beach Park	1.001	0.436	43.6	0.436	0.000	0.0
Bedford Park	12.562	9.920	79.0	9.920	0.782	7.9
Bellwood	2.102	1.871	89.0	1.871	0.105	5.6
Bensenville	2.575	2.240	87.0	2.240	0.609	27.2
Berkeley	0.831	0.701	84.4	0.701	0.021	3.0
Berwyn	6.125	5.213	85.1	5.213		
Bloomingdale	2.795	2.202	78.8	2.202	0.000	0.0
Blue Island	2.803	2.327	83.0	2.327	0.159	6.8
Bombardier Motor Corporation of America	0.020	0.011	55.0	0.011	0.000	0.0
Bridgeview	2.484	2.010	80.9	2.010	0.158	7.9
Broadview	1.474	1.152	78.2	1.152	0.136	11.8
Brookfield	2.190	1.885	86.1	1.885	0.212	11.3
Buffalo Grove	4.802	4.090	85.2	4.090	0.072	1.8
Burr Ridge	2.190	1.848	84.4	1.848	0.092	5.0
Calumet City	4.912	3.948	80.4	3.948	0.358	9.1
Calumet Park	1.016	0.741	72.9	0.741	0.024	3.2
Carol Stream	4.270	3.230	75.6	3.230	0.048	1.5
Central Lake County Joint Action Water Agency	0.100	0.372	372.0	0.372	0.000	0.0
Central Stickney Sanitary District	0.196	0.157	79.8	0.157	0.000	0.0
Chicago	596.282	479.032	80.3	479.032	7.268	1.5

Water Year 2011: Lake Michigan Water Allocation, Pumpage, and Unaccounted-For-Flow Summary

System Name	Allocation (mgd)	Net Annual Pumpage (mgd)	% Net Annual Pumpage To Allocation	Net Annual Lake Pumpage (mgd)	Unaccounted For Flow (mgd)	% Unaccounted For Flow To Net Annual Pumpage
Chicago Heights	5.844	5.745	98.3	5.745	0.884	15.4
Chicago Ridge	1.524	1.385	90.9	1.385	0.132	9.6
Cicero	7.299	7.324	100.3	7.324	0.378	5.2
Clarendon Hills	0.838	0.707	84.4	0.707	0.000	0.0
Country Club Hills	1.458	1.233	84.6	1.233	0.000	0.0
Countryside	0.981	0.973	99.1	0.973	0.078	8.0
Crestwood	1.402	1.222	87.2	1.222	0.064	5.2
Darien	2.965	2.235	75.4	2.235	0.035	1.6
Deerfield	2.935	2.569	87.5	2.569	0.160	6.2
Delmar Woods Water Company	0.023	0.020	87.0	0.020	0.002	7.5
Des Plaines	7.941	6.474	81.5	6.474	0.705	10.9
Dixmoor	0.631	0.557	88.3	0.557	0.043	7.7
Dolton	3.143	1.440	45.8	1.440	0.036	2.5
Downers Grove	6.656	5.843	87.8	5.843	0.093	1.6
DuPage-Glen Ellyn Heights	0.217	0.197	90.8	0.197	0.003	1.3
DuPage-Hobson Valley	0.070	0.056	80.0	0.056	0.009	15.3
DuPage-Southeast	0.649	0.622	95.8	0.622	0.000	0.0
DuPage-Steeple Run	0.184	0.138	75.0	0.000	0.000	0.0
DuPage-York Township	0.041	0.012	29.3	0.000	0.000	0.0
East Hazel Crest	0.205	0.157	76.6	0.157	0.000	0.0
Elk Grove Village	7.743	5.065	65.4	5.065	0.223	4.4
Elmhurst	4.704	4.310	91.6	4.310	0.000	0.0
Elmwood Park	2.813	1.970	70.0	1.970	0.084	4.3
Evanston	9.361	7.799	83.3	7.799	0.413	5.3
Evergreen Park	2.644	2.009	76.0	2.009	0.117	5.8
Flossmoor	1.195	1.175	98.3	1.175	0.090	7.7
Ford Heights	0.392	0.459	117.1	0.459	0.057	12.3

Water Year 2011: Lake Michigan Water Allocation, Pumpage, and Unaccounted-For-Flow Summary

System Name	Allocation (mgd)	Net Annual Pumpage (mgd)	% Net Annual Pumpage To Allocation	Net Annual Lake Pumpage (mgd)	Unaccounted For Flow (mgd)	% Unaccounted For Flow To Net Annual Pumpage
Forest Park	2.129	1.784	83.8	1.784	0.116	6.5
Forest View	0.156	0.105	67.3	0.105	0.000	0.0
Fox Lake	0.000	0.789	0.0	0.000	0.059	7.5
Franklin Park	5.004	3.447	68.9	3.447	0.269	7.8
Garden Homes Sanitary District	0.086	0.068	79.1	0.068	0.000	0.0
Glen Ellyn	3.003	2.447	81.5	2.447	0.000	0.0
Glenbrook Sanitary District	0.140	0.108	77.1	0.108	0.000	0.0
Glencoe	1.882	1.480	78.6	1.480	0.041	2.7
Glendale Heights	2.879	2.538	88.2	2.538	0.163	6.4
Glenview	10.963	8.465	77.2	8.465	0.172	2.0
Glenwood	1.155	0.990	85.7	0.990	0.017	1.7
Golf	0.086	0.056	65.1	0.056	0.004	7.0
Golf Greenwood Gardens	0.013	0.012	92.3	0.012	0.000	0.0
Grayslake	1.796	1.421	79.1	1.421	0.077	5.4
Green Oaks	0.304	0.130	42.8	0.130	0.002	1.8
Gurnee	4.563	4.133	90.6	4.133	0.209	5.1
Hanover Park	3.073	2.601	84.6	2.545	0.000	0.0
Harvey	4.038	3.832	94.9	3.832	0.305	8.0
Harwood Heights	0.963	0.811	84.2	0.811	0.029	3.5
Hazel Crest	1.544	1.218	78.9	1.218	0.094	7.7
Hickory Hills	1.402	1.188	84.7	1.188	0.058	4.9
Highland Park	5.722	4.729	82.6	4.729	0.313	6.6
Highwood	0.655	0.559	85.3	0.559	0.068	12.2
Hillside	1.224	1.055	86.2	1.055	0.207	19.6
Hinsdale	2.778	2.535	91.3	2.535	0.444	17.5
Hodgkins	0.638	0.479	75.0	0.479	0.054	11.2
Hoffman Estates	6.169	4.907	79.5	4.907	0.270	5.5

Water Year 2011: Lake Michigan Water Allocation, Pumpage, and Unaccounted-For-Flow Summary

System Name	Allocation (mgd)	Net Annual Pumpage (mgd)	% Net Annual Pumpage To Allocation	Net Annual Lake Pumpage (mgd)	Unaccounted For Flow (mgd)	% Unaccounted For Flow To Net Annual Pumpage
Hometown	0.430	0.345	80.2	0.345	0.058	16.9
Homewood	1.986	1.595	80.3	1.595	0.068	4.2
Illinois American Water Company - Alpine	0.065	0.048	73.8	0.048	0.000	0.0
Illinois American Water Company - Arbury	0.171	0.128	74.9	0.000	0.000	0.0
Illinois American Water Company - Arrowhead	0.190	0.130	68.4	0.130	0.000	0.0
Illinois American Water Company - Chicago Suburban	1.974	1.636	82.9	1.636	0.151	9.2
Illinois American Water Company - Country Club Highland	0.105	0.088	83.8	0.088	0.000	0.0
Illinois American Water Company - Derby Meadows	2.715	1.877	69.1	1.877	0.081	4.3
Illinois American Water Company - DuPage Utility	0.558	0.438	78.5	0.438	0.003	0.7
Illinois American Water Company - Fernway	0.592	0.507	85.6	0.507	0.000	0.0
Illinois American Water Company - Liberty Ridge East	0.042	0.024	57.1	0.024	0.000	0.0
Illinois American Water Company - Liberty Ridge West	0.309	0.254	82.2	0.254	0.000	0.0
Illinois American Water Company - Lombard Heights	0.065	0.045	69.2	0.045	0.005	11.7
Illinois American Water Company - Moreland	0.064	0.050	78.1	0.050	0.000	0.0
Illinois American Water Company - Valley View	0.700	0.524	74.9	0.524	0.000	0.0
Illinois American Water Company - Waycinden	0.706	0.439	62.2	0.439	0.005	1.1
Illinois American Water Company -West Suburban/Santa Fe	7.050	6.186	87.7	6.186	0.147	2.4
Illinois Beach State Park	0.080	0.046	57.5	0.046	0.000	0.0
Indian Head Park	0.336	0.266	79.2	0.263	0.012	4.4
Itasca	1.691	1.252	74.0	1.252	0.053	4.3
Justice	1.509	1.386	91.8	1.386	0.102	7.3
Kenilworth	0.482	0.389	80.7	0.389	0.045	11.7
La Grange	1.920	1.550	80.7	1.550	0.269	17.4
La Grange Park	1.270	1.207	95.0	1.207	0.085	7.0
LaGrange Highlands Sanitary District	0.627	0.464	74.0	0.464	0.020	4.3
Lake County - Fox Lake Hills	0.000	0.141	0.0	0.000	0.000	0.0
Lake County - Grandwood Park	0.000	0.349	0.0	0.000	0.000	0.0

Water Year 2011: Lake Michigan Water Allocation, Pumpage, and Unaccounted-For-Flow Summary

System Name	Allocation (mgd)	Net Annual Pumpage (mgd)	% Net Annual Pumpage To Allocation	Net Annual Lake Pumpage (mgd)	Unaccounted For Flow (mgd)	% Unaccounted For Flow To Net Annual Pumpage
Lake County - Knollwood-Rondout	0.731	0.618	84.5	0.618	0.000	0.0
Lake County - Vernon Hills	3.123	2.769	88.7	2.769	0.186	6.7
Lake County - Wildwood	1.231	1.018	82.7	1.018	0.012	1.2
Lake County Public Water District	0.075	0.078	104.0	0.078	0.000	0.0
Lake Forest	4.431	3.831	86.5	3.831	0.371	9.7
Lake Villa	0.000	0.602	0.0	0.000	0.004	0.7
Lake Zurich	0.000	1.679	0.0	0.000	0.062	3.7
Lansing	3.942	3.226	81.8	3.226	0.227	7.0
Leyden	0.969	0.826	85.2	0.826	0.047	5.7
Libertyville	2.978	2.544	85.4	2.544	0.151	5.9
Lincolnshire	1.548	1.265	81.7	1.265	0.000	0.0
Lincolnwood	2.329	1.753	75.3	1.753	0.081	4.6
Lindenhurst	0.000	1.018	0.0	0.000	0.013	1.3
Lisle	3.048	2.408	79.0	2.408	0.017	0.7
Lockport	3.545	2.785	78.6	0.000	0.519	18.6
Lombard	4.817	4.275	88.7	4.275	0.168	3.9
Long Grove	0.000	0.012	0.0	-0.001	0.000	1.7
Loyola University Medical Center	0.520	0.464	89.2	0.464	0.000	0.0
Lynwood	1.096	0.706	64.4	0.706	0.001	0.2
Lyons	1.026	1.150	112.1	1.150	0.334	29.1
Markham	1.399	1.620	115.8	1.620	0.531	32.8
Matteson	2.286	1.687	73.8	1.687	0.000	0.0
Maywood	3.393	2.940	86.6	2.940	0.305	10.4
McCook	1.639	0.977	59.6	0.977	0.227	23.2
Melrose Park	3.911	3.694	94.5	3.694	0.175	4.7
Merrionette Park	0.233	0.172	73.8	0.172	0.000	0.0
Midlothian	1.604	1.273	79.4	1.273	0.146	11.5

Water Year 2011: Lake Michigan Water Allocation, Pumpage, and Unaccounted-For-Flow Summary

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Mission Brook Sanitary District	0.275	0.218	79.3	0.218	0.007	3.3
Mokena	2.419	1.696	70.1	1.696	0.000	0.0
Morton Grove	3.423	2.771	81.0	2.771	0.201	7.3
Mount Prospect	4.488	3.567	79.5	3.567	0.000	0.0
Mundelein	2.944	2.526	85.8	2.526	0.000	0.0
Naperville	19.091	15.331	80.3	15.331	0.000	0.0
New Lenox	2.742	1.948	71.0	1.948	0.000	0.0
Niles	4.943	4.045	81.8	4.045	0.312	7.7
Norridge	1.916	1.338	69.8	1.338	0.019	1.4
North Chicago	5.038	3.700	73.4	3.700	0.250	6.7
North Riverside	1.006	1.022	101.6	1.022	0.084	8.2
Northbrook	6.059	5.018	82.8	5.018	0.382	7.6
Northfield	1.057	0.969	91.7	0.969	0.101	10.4
Northlake	2.964	2.183	73.7	2.183	0.145	6.6
Oak Brook	4.235	2.974	70.2	2.974	0.171	5.7
Oak Forest	3.002	2.457	81.8	2.457	0.139	5.7
Oak Forest Hospital	0.300	0.304	101.3	0.304	0.000	0.0
Oak Lawn	7.109	5.520	77.6	5.520	0.299	5.4
Oak Park	5.887	4.740	80.5	4.740	0.180	3.8
Oakbrook Terrace	0.283	0.161	56.9	0.161	0.000	0.0
Olympia Fields	0.841	0.560	66.6	0.560	0.000	0.0
Orland Park	8.208	6.552	79.8	6.552	0.086	1.3
Palatine	7.838	6.533	83.4	6.533	0.000	0.0
Palos Heights	2.057	1.555	75.6	1.555	0.000	0.0
Palos Hills	1.971	1.441	73.1	1.441	0.000	0.0
Palos Park	0.585	0.435	74.4	0.435	0.000	0.0
Park City	0.595	0.516	86.7	0.516	0.005	0.9

Water Year 2011: Lake Michigan Water Allocation, Pumpage, and Unaccounted-For-Flow Summary

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Park Ridge	4.901	4.348	88.7	4.348	0.385	8.9
Phoenix	0.199	0.140	70.4	0.140	0.000	0.0
Plainfield	6.448	3.091	47.9	3.091	0.011	0.4
Posen	0.499	0.465	93.2	0.465	0.007	1.5
Prospect Heights	0.460	0.191	41.5	0.191	0.034	17.9
River Forest	1.639	1.368	83.5	1.368	0.139	10.2
River Grove	1.269	1.147	90.4	1.147	0.261	22.7
Riverdale	1.643	1.541	93.8	1.541	0.132	8.6
Riverside	0.986	0.683	69.3	0.683	0.000	0.0
Riverwoods	0.533	0.361	67.7	0.361	0.009	2.5
Robbins	1.763	1.480	83.9	1.480	0.255	17.3
Rolling Meadows	3.034	2.192	72.2	2.190	0.016	0.7
Roselle	2.221	1.722	77.5	1.722	0.005	0.3
Rosemont	2.493	1.517	60.9	1.517	0.098	6.5
Round Lake	1.800	1.076	59.8	1.076	0.012	1.1
Round Lake Beach	2.145	1.823	85.0	1.818	0.160	8.8
Round Lake Heights	0.205	0.139	67.8	0.139	0.000	0.0
Round Lake Park	0.429	0.343	80.0	0.343	0.017	5.0
Schaumburg	10.557	8.450	80.0	8.450	0.156	1.9
Schiller Park	2.171	1.614	74.3	1.614	0.091	5.6
Shorewood	1.883	1.236	65.6	0.000	0.000	0.0
Skokie	10.338	8.110	78.4	8.110	0.644	7.9
South Chicago Heights	0.531	0.379	71.4	0.379	0.014	3.7
South Holland	2.832	2.967	104.8	2.967	0.051	1.7
South Palos Township	0.130	0.100	76.9	0.100	0.000	0.0
South Stickney Sanitary District	2.940	2.730	92.9	2.730	0.206	7.5
Stickney	1.357	1.492	109.9	1.492	0.076	5.1

Water Year 2011: Lake Michigan Water Allocation, Pumpage, and Unaccounted-For-Flow Summary

System Name	Allocation (mgd)	Net Annual Pumpage (mgd)	% Net Annual Pumpage To Allocation	Net Annual Lake Pumpage (mgd)	Unaccounted For Flow (mgd)	% Unaccounted For Flow To Net Annual Pumpage
Stone Park	0.380	0.370	97.4	0.370	0.000	0.0
Streamwood	3.567	2.948	82.6	2.948	0.003	0.1
Summit	1.210	1.089	90.0	1.089	0.059	5.4
Thornton	0.286	0.262	91.6	0.262	0.020	7.7
Tinley Park	6.709	5.344	79.7	5.344	0.000	0.0
Villa Park	2.152	1.633	75.9	1.633	0.000	0.0
Volo	0.000	0.231	0.0	0.000	0.000	0.0
Wauconda	0.000	1.158	0.0	0.000	0.063	5.4
Waukegan	8.932	7.138	79.9	7.138	0.373	5.2
Westchester	2.107	1.563	74.2	1.563	0.091	5.8
Westmont	2.957	2.353	79.6	2.353	0.024	1.0
Wheaton	5.840	4.726	80.9	4.726	0.000	0.0
Wheeling	5.266	3.900	74.1	3.900	0.206	5.3
Willow Springs	0.673	0.528	78.5	0.528	0.004	0.9
Willowbrook	1.286	1.005	78.1	1.005	0.002	0.2
Wilmette	3.872	3.337	86.2	3.337	0.446	13.4
Winfield	1.029	0.826	80.3	0.826	0.000	0.0
Winnetka	2.560	2.298	89.8	2.298	0.190	8.3
Winthrop Harbor	0.614	0.445	72.476	0.445	0.014	3.1
Wood Dale	1.620	1.180	72.8	1.180	0.000	0.0
Woodridge	3.936	2.866	72.8	2.866	0.098	3.4
Worth	1.108	1.086	98.0	1.086	0.224	20.6
Zion	2.534	2.036	80.3	2.036	0.077	3.8
Total:	1106.388	899.205		887.681	28.810	
Average:	5.269	4.282	77.768	4.227	0.138	4.9

SYSTEM NAME	Lake Michigan Water Allocations (millions of gallons per day)																
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Addison	4.207	4.230	4.252	4.275	4.298	4.321	4.343	4.366	4.389	4.412	4.434	4.457	4.480	4.503	4.525	4.548	4.571
Alsip	4.309	4.332	4.356	4.379	4.402	4.425	4.448	4.471	4.495	4.518	4.541	4.564	4.587	4.611	4.634	4.657	4.680
Antioch*	0.000	0.000	0.000	0.000	0.000	0.000	1.532	1.575	1.638	1.703	1.751	1.821	1.894	1.947	2.025	2.105	2.164
Arlington Heights	9.566	9.596	9.626	9.656	9.686	9.715	9.745	9.775	9.805	9.835	9.865	9.895	9.925	9.955	9.985	10.015	10.045
Bannockburn	0.368	0.369	0.370	0.371	0.373	0.374	0.375	0.377	0.378	0.380	0.381	0.383	0.384	0.385	0.386	0.387	0.388
Beach Park	0.966	0.983	1.001	1.019	1.036	1.054	1.072	1.090	1.108	1.125	1.143	1.161	1.179	1.197	1.214	1.232	1.250
Bedford Park	12.561	12.561	12.562	12.562	12.563	12.563	12.564	12.564	12.565	12.565	12.566	12.566	12.567	12.567	12.568	12.568	12.569
Bellwood	2.099	2.100	2.102	2.104	2.105	2.107	2.108	2.110	2.111	2.113	2.114	2.115	2.119	2.122	2.126	2.129	2.133
Bensenville	2.566	2.571	2.575	2.580	2.584	2.589	2.593	2.598	2.602	2.607	2.611	2.616	2.620	2.625	2.629	2.634	2.638
Berkeley	0.831	0.831	0.831	0.831	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830
Berwyn	6.080	6.103	6.125	6.148	6.170	6.193	6.215	6.238	6.260	6.283	6.305	6.328	6.350	6.373	6.395	6.418	6.440
Bloomingdale	2.739	2.767	2.795	2.823	2.851	2.879	2.907	2.936	2.964	2.992	3.020	3.048	3.076	3.104	3.133	3.161	3.189
Blue Island	2.784	2.794	2.803	2.813	2.822	2.832	2.841	2.851	2.860	2.870	2.879	2.888	2.898	2.907	2.917	2.926	2.936
Bombardier Motor Corporation of America	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020
Bridgeview	2.480	2.482	2.484	2.486	2.489	2.491	2.493	2.495	2.497	2.500	2.502	2.504	2.506	2.508	2.511	2.513	2.515
Broadview	1.471	1.473	1.474	1.475	1.476	1.478	1.479	1.480	1.481	1.483	1.484	1.485	1.486	1.488	1.489	1.490	1.491
Brookfield	2.185	2.188	2.190	2.193	2.196	2.198	2.201	2.204	2.207	2.209	2.212	2.215	2.218	2.220	2.223	2.226	2.229
Buffalo Grove	4.765	4.783	4.802	4.820	4.838	4.857	4.875	4.893	4.912	4.930	4.948	4.966	4.985	5.003	5.021	5.040	5.058
Burnham	0.495	0.496	0.498	0.499	0.501	0.502	0.504	0.506	0.507	0.509	0.510	0.512	0.514	0.515	0.517	0.518	0.520
Burr Ridge	2.140	2.165	2.190	2.215	2.240	2.265	2.290	2.316	2.341	2.366	2.391	2.416	2.441	2.466	2.491	2.516	2.541
Calumet City	4.892	4.902	4.912	4.922	4.932	4.942	4.952	4.962	4.972	4.982	4.992	5.002	5.012	5.023	5.033	5.043	5.053
Calumet Park	1.013	1.014	1.016	1.017	1.019	1.020	1.022	1.023	1.025	1.026	1.027	1.029	1.032	1.036	1.039	1.043	1.046
Carol Stream	4.183	4.213	4.270	4.327	4.385	4.442	4.499	4.519	4.539	4.560	4.580	4.600	4.641	4.682	4.722	4.763	4.804
Central Lake County Joint Action Water Agency	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
Central Stickney Sanitary District	0.196	0.196	0.196	0.196	0.196	0.196	0.196	0.196	0.196	0.197	0.197	0.197	0.197	0.197	0.197	0.197	0.197
Chicago	592.492	594.387	596.282	598.177	600.071	601.966	603.861	605.756	607.650	609.545	611.440	613.335	615.230	617.124	619.019	620.914	622.809
Chicago Heights	5.784	5.814	5.844	5.874	5.904	5.934	5.964	5.993	6.023	6.053	6.083	6.113	6.143	6.173	6.203	6.232	6.262
Chicago Ridge	1.522	1.523	1.524	1.525	1.526	1.527	1.528	1.529	1.529	1.530	1.531	1.532	1.533	1.534	1.535	1.536	1.537
Cicero	7.326	7.313	7.299	7.285	7.272	7.258	7.244	7.231	7.217	7.203	7.190	7.176	7.162	7.149	7.135	7.121	7.108
Clarendon Hills	0.827	0.832	0.838	0.843	0.849	0.855	0.860	0.866	0.871	0.877	0.882	0.888	0.893	0.899	0.904	0.910	0.915
Country Club Hills	1.435	1.447	1.458	1.469	1.481	1.492	1.503	1.515	1.526	1.537	1.548	1.560	1.571	1.582	1.594	1.605	1.616
Countryside	0.976	0.978	0.981	0.984	0.987	0.989	0.992	0.995	0.997	1.000	1.003	1.006	1.008	1.011	1.014	1.016	1.019
Crestwood	1.386	1.394	1.402	1.409	1.417	1.425	1.432	1.440	1.448	1.455	1.463	1.471	1.478	1.486	1.494	1.502	1.509
Darien	2.903	2.934	2.965	2.996	3.026	3.057	3.088	3.121	3.154	3.188	3.221	3.254	3.258	3.262	3.266	3.270	3.274
Deerfield	2.898	2.917	2.935	2.953	2.972	2.990	3.008	3.027	3.045	3.063	3.082	3.100	3.118	3.137	3.155	3.173	3.192
Delmar Woods Water Company	0.022	0.022	0.023	0.023	0.023	0.023	0.023	0.024	0.024	0.024	0.024	0.024	0.025	0.025	0.025	0.025	0.025
Des Plaines	7.914	7.928	7.941	7.955	7.969	7.982	7.996	8.009	8.023	8.037	8.050	8.064	8.077	8.091	8.105	8.118	8.132
Dixmoor	0.626	0.629	0.631	0.633	0.635	0.637	0.639	0.641	0.644	0.646	0.648	0.650	0.652	0.654	0.656	0.658	0.661
Dolton	3.138	3.141	3.143	3.146	3.149	3.151	3.154	3.157	3.160	3.162	3.165	3.168	3.171	3.173	3.176	3.179	3.182

SYSTEM NAME	Lake Michigan Water Allocations (millions of gallons per day)																
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Downers Grove	6.521	6.589	6.656	6.724	6.792	6.859	6.927	6.994	7.062	7.130	7.197	7.265	7.333	7.400	7.468	7.536	7.603
DuPage County-Glen Ellyn Heights	0.204	0.210	0.217	0.223	0.230	0.236	0.243	0.251	0.259	0.267	0.275	0.283	0.293	0.303	0.313	0.323	0.333
DuPage County-Hobson Valley	0.051	0.051	0.070	0.075	0.081	0.087	0.093	0.099	0.106	0.112	0.119	0.126	0.133	0.140	0.146	0.153	0.160
DuPage County-Southeast	0.637	0.643	0.649	0.656	0.662	0.669	0.675	0.682	0.688	0.695	0.701	0.708	0.715	0.722	0.730	0.737	0.744
DuPage County-Steeple Run	0.182	0.183	0.184	0.184	0.185	0.185	0.186	0.187	0.187	0.188	0.188	0.189	0.190	0.190	0.191	0.191	0.192
DuPage County-York Township	0.000	0.000	0.041	0.172	0.270	0.332	0.389	0.450	0.496	0.541	0.601	0.646	0.691	0.735	0.737	0.739	0.741
East Hazel Crest	0.205	0.205	0.205	0.206	0.206	0.207	0.207	0.208	0.208	0.209	0.209	0.210	0.210	0.210	0.210	0.210	0.210
Elk Grove Village	7.663	7.703	7.743	7.783	7.822	7.862	7.902	7.944	7.987	8.029	8.072	8.114	8.114	8.114	8.114	8.114	8.114
Elmhurst	4.693	4.699	4.704	4.709	4.714	4.719	4.724	4.729	4.734	4.739	4.744	4.749	4.754	4.760	4.765	4.770	4.775
Elmwood Park	2.808	2.810	2.813	2.815	2.818	2.820	2.822	2.825	2.827	2.830	2.832	2.834	2.837	2.839	2.841	2.844	2.846
Evanston	9.328	9.344	9.361	9.378	9.395	9.411	9.428	9.445	9.461	9.478	9.495	9.512	9.528	9.545	9.562	9.578	9.595
Evergreen Park	2.643	2.643	2.644	2.644	2.645	2.645	2.646	2.647	2.647	2.648	2.648	2.649	2.649	2.650	2.651	2.651	2.652
Flossmoor	1.187	1.191	1.195	1.199	1.203	1.207	1.211	1.215	1.219	1.223	1.227	1.231	1.235	1.239	1.243	1.247	1.251
Ford Heights	0.378	0.385	0.392	0.399	0.405	0.412	0.419	0.426	0.433	0.440	0.447	0.454	0.461	0.468	0.475	0.482	0.489
Forest Park	2.121	2.125	2.129	2.133	2.138	2.142	2.146	2.150	2.154	2.159	2.163	2.167	2.171	2.175	2.180	2.184	2.188
Forest View	0.156	0.156	0.156	0.157	0.157	0.157	0.158	0.158	0.159	0.159	0.159	0.160	0.160	0.160	0.161	0.161	0.162
Fox Lake*	0.000	0.000	0.000	0.000	0.000	0.000	0.960	0.980	1.000	1.020	1.040	1.060	1.080	1.100	1.120	1.140	1.160
Franklin Park	4.985	4.994	5.004	5.013	5.022	5.031	5.041	5.050	5.059	5.068	5.078	5.087	5.096	5.105	5.115	5.124	5.133
Garden Homes Sanitary District	0.086	0.086	0.086	0.086	0.087	0.087	0.087	0.087	0.087	0.088	0.088	0.088	0.088	0.088	0.089	0.089	0.089
Glen Ellyn	2.978	2.985	3.003	3.021	3.039	3.057	3.075	3.092	3.110	3.128	3.146	3.164	3.183	3.201	3.220	3.239	3.258
Glenbrook Sanitary District	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
Glencoe	1.878	1.880	1.882	1.884	1.886	1.888	1.890	1.892	1.894	1.896	1.898	1.900	1.902	1.904	1.906	1.908	1.909
Glendale Heights	2.858	2.869	2.879	2.890	2.901	2.912	2.923	2.934	2.945	2.956	2.967	2.977	2.988	2.999	3.010	3.021	3.032
Glenview	10.657	10.810	10.963	11.117	11.270	11.423	11.577	11.730	11.883	12.037	12.190	12.343	12.497	12.650	12.803	12.957	13.110
Glenwood	1.122	1.138	1.155	1.171	1.187	1.204	1.220	1.237	1.253	1.270	1.286	1.303	1.319	1.336	1.352	1.369	1.385
Golf	0.086	0.086	0.086	0.086	0.086	0.086	0.086	0.086	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087
Golf Greenwood Gardens Improvement Association	0.000	0.000	0.013	0.013	0.013	0.013	0.013	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
Grayslake	1.764	1.780	1.796	1.813	1.829	1.846	1.862	1.878	1.894	1.911	1.927	1.943	1.959	1.975	1.992	2.008	2.024
Green Oaks	0.221	0.281	0.304	0.328	0.351	0.375	0.398	0.398	0.398	0.398	0.398	0.398	0.398	0.398	0.398	0.398	0.398
Gurnee	4.469	4.516	4.563	4.610	4.658	4.705	4.752	4.799	4.846	4.894	4.941	4.988	5.034	5.081	5.127	5.174	5.220
Hanover Park	3.060	3.066	3.073	3.080	3.086	3.093	3.100	3.106	3.113	3.120	3.126	3.133	3.140	3.147	3.153	3.160	3.167
Harvey	4.015	4.027	4.038	4.050	4.062	4.073	4.085	4.097	4.109	4.120	4.132	4.144	4.156	4.167	4.179	4.191	4.203
Harwood Heights	0.961	0.962	0.963	0.963	0.964	0.965	0.966	0.966	0.967	0.968	0.968	0.969	0.970	0.970	0.971	0.972	0.973
Hazel Crest	1.534	1.539	1.544	1.549	1.554	1.559	1.564	1.568	1.573	1.578	1.583	1.588	1.593	1.598	1.603	1.608	1.612
Hickory Hills	1.397	1.400	1.402	1.404	1.406	1.409	1.411	1.413	1.415	1.418	1.420	1.422	1.424	1.427	1.429	1.431	1.433
Highland Park	5.696	5.705	5.722	5.739	5.755	5.772	5.789	5.806	5.823	5.840	5.857	5.874	5.889	5.904	5.919	5.934	5.949
Highwood	0.654	0.654	0.655	0.655	0.656	0.657	0.657	0.658	0.658	0.659	0.660	0.660	0.661	0.661	0.662	0.663	0.663
Hillside	1.224	1.224	1.224	1.224	1.224	1.224	1.224	1.224	1.224	1.224	1.224	1.224	1.224	1.224	1.224	1.224	1.224
Hinsdale	2.745	2.762	2.778	2.794	2.810	2.826	2.842	2.858	2.874	2.890	2.906	2.923	2.939	2.955	2.971	2.987	3.003
Hodgkins	0.630	0.634	0.638	0.642	0.646	0.650	0.654	0.659	0.663	0.667	0.671	0.675	0.679	0.683	0.687	0.691	0.695
Hoffman Estates	6.032	6.101	6.169	6.237	6.305	6.373	6.441	6.511	6.582	6.653	6.724	6.794	6.846	6.899	6.952	7.004	7.057
Hometown	0.429	0.430	0.430	0.430	0.431	0.431	0.432	0.432	0.433	0.433	0.434	0.434	0.434	0.435	0.435	0.436	0.436
Homewood	1.975	1.980	1.986	1.992	1.997	2.003	2.008	2.014	2.020	2.025	2.031	2.036	2.042	2.048	2.053	2.059	2.064

SYSTEM NAME	Lake Michigan Water Allocations (millions of gallons per day)																
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Illinois American Water Company - Alpine	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
Illinois American Water Company - Arbury*	0.164	0.167	0.171	0.175	0.179	0.183	0.187	0.191	0.195	0.199	0.203	0.207	0.211	0.215	0.219	0.223	0.227
Illinois American Water Company - Arrowhead	0.190	0.190	0.190	0.190	0.190	0.190	0.190	0.190	0.190	0.190	0.190	0.190	0.190	0.190	0.190	0.190	0.190
Illinois American Water Company - Chicago Suburban	1.954	1.958	1.974	1.989	2.005	2.021	2.037	2.053	2.069	2.085	2.101	2.118	2.134	2.150	2.166	2.182	2.198
Illinois American Water Company - Country Club Highland	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105
Illinois American Water Company - Derby Meadows	2.371	2.543	2.715	2.887	3.060	3.232	3.404	3.576	3.748	3.920	4.092	4.264	4.436	4.608	4.781	4.953	5.125
Illinois American Water Company - DuPage Utility	0.553	0.555	0.558	0.561	0.564	0.567	0.570	0.573	0.576	0.579	0.582	0.585	0.588	0.591	0.594	0.597	0.600
Illinois American Water Company - Fernway	0.591	0.591	0.592	0.592	0.593	0.593	0.594	0.595	0.595	0.596	0.596	0.597	0.598	0.598	0.599	0.599	0.600
Illinois American Water Company - Liberty Ridge East	0.041	0.042	0.042	0.043	0.043	0.044	0.045	0.045	0.046	0.046	0.047	0.048	0.048	0.049	0.050	0.050	0.051
Illinois American Water Company - Liberty Ridge West	0.300	0.305	0.309	0.313	0.318	0.322	0.326	0.331	0.335	0.340	0.344	0.349	0.354	0.359	0.364	0.369	0.374
Illinois American Water Company - Lombard Heights	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
Illinois American Water Company - Moreland	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064
Illinois American Water Company - Valley View	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700
Illinois American Water Company - Waycinden	0.704	0.705	0.706	0.707	0.708	0.709	0.709	0.710	0.711	0.712	0.713	0.714	0.714	0.714	0.714	0.714	0.714
Illinois American Water Company -West Suburban/Santa Fe	6.818	6.934	7.050	7.166	7.281	7.397	7.513	7.629	7.745	7.860	7.976	8.092	8.208	8.324	8.440	8.556	8.672
Illinois Beach State Park	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
Indian Head Park	0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.336
Itasca	1.607	1.666	1.691	1.716	1.742	1.767	1.792	1.824	1.856	1.887	1.919	1.951	1.983	2.015	2.047	2.079	2.111
John G. Shedd Aquarium	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023
Justice	1.484	1.497	1.509	1.521	1.534	1.546	1.559	1.571	1.584	1.596	1.609	1.621	1.634	1.646	1.659	1.671	1.683
Kenilworth	0.482	0.482	0.482	0.482	0.482	0.482	0.482	0.482	0.482	0.482	0.482	0.482	0.482	0.482	0.482	0.482	0.482
LaGrange	1.910	1.915	1.920	1.925	1.930	1.935	1.940	1.945	1.950	1.954	1.959	1.964	1.974	1.984	1.994	2.004	2.014
LaGrange Park	1.269	1.270	1.270	1.271	1.272	1.272	1.273	1.274	1.275	1.275	1.276	1.277	1.280	1.283	1.286	1.289	1.291
LaGrange Highlands Sanitary District	0.594	0.623	0.627	0.632	0.636	0.641	0.645	0.649	0.654	0.658	0.663	0.667	0.667	0.667	0.667	0.667	0.667
Lake Bluff	0.814	0.820	0.826	0.832	0.839	0.845	0.851	0.857	0.864	0.870	0.876	0.882	0.889	0.895	0.901	0.907	0.914
Lake County - Fox Lake Hills*	0.000	0.000	0.000	0.000	0.000	0.000	0.185	0.185	0.190	0.190	0.190	0.190	0.190	0.190	0.190	0.190	0.190
Lake County - Grandwood Park*	0.000	0.000	0.000	0.000	0.000	0.000	0.440	0.440	0.440	0.440	0.440	0.440	0.440	0.450	0.450	0.450	0.450
Lake County - Knollwood-Rondout	0.700	0.716	0.731	0.746	0.761	0.776	0.791	0.806	0.821	0.836	0.851	0.866	0.869	0.872	0.874	0.877	0.880
Lake County - Vernon Hills	3.039	3.081	3.123	3.165	3.206	3.248	3.290	3.332	3.374	3.416	3.458	3.500	3.500	3.500	3.500	3.500	3.500
Lake County - Wildwood	1.191	1.211	1.231	1.251	1.270	1.290	1.310	1.330	1.350	1.370	1.390	1.410	1.410	1.410	1.410	1.410	1.410
Lake County Public Water District	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075
Lake Forest	4.324	4.408	4.431	4.454	4.476	4.499	4.522	4.544	4.567	4.589	4.612	4.635	4.657	4.680	4.703	4.725	4.748
Lake Villa*	0.000	0.000	0.000	0.000	0.000	0.000	0.780	0.800	0.820	0.840	0.870	0.890	0.910	0.940	0.960	0.990	1.010
Lake Zurich*	0.000	0.000	0.000	0.000	0.000	0.000	2.183	2.224	2.266	2.306	2.348	2.391	2.432	2.474	2.518	2.559	2.602
Lansing	3.908	3.925	3.942	3.959	3.976	3.993	4.009	4.026	4.043	4.060	4.077	4.094	4.110	4.127	4.144	4.161	4.178
Leyden Township	0.957	0.959	0.969	0.979	0.990	1.000	1.010	1.018	1.027	1.035	1.044	1.052	1.057	1.061	1.066	1.070	1.075
Libertyville	2.946	2.962	2.978	2.994	3.010	3.026	3.042	3.058	3.074	3.090	3.106	3.122	3.138	3.154	3.170	3.186	3.202
Lincolnshire	1.517	1.533	1.548	1.563	1.579	1.594	1.609	1.624	1.640	1.655	1.670	1.686	1.701	1.716	1.732	1.747	1.762
Lincolnwood	2.319	2.324	2.329	2.334	2.339	2.344	2.349	2.355	2.360	2.365	2.371	2.376	2.381	2.387	2.392	2.398	2.403
Lindenhurst*	0.000	0.000	0.000	0.000	0.000	0.000	1.250	1.260	1.280	1.290	1.300	1.310	1.320	1.340	1.350	1.360	1.370
Lisle	3.001	3.024	3.048	3.072	3.095	3.119	3.143	3.166	3.190	3.213	3.237	3.261	3.284	3.308	3.332	3.355	3.379
Lockport*	3.341	3.443	3.545	3.648	3.750	3.852	3.955	4.057	4.160	4.262	4.365	4.467	4.569	4.672	4.774	4.876	4.979
Lombard	4.737	4.777	4.817	4.857	4.897	4.937	4.977	5.017	5.057	5.097	5.137	5.177	5.217	5.257	5.297	5.337	5.377

SYSTEM NAME	Lake Michigan Water Allocations (millions of gallons per day)																
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Long Grove*	0.000	0.000	0.000	0.000	0.000	0.000	0.096	0.111	0.129	0.150	0.175	0.203	0.237	0.275	0.320	0.372	0.433
Loyola University Medical Center	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520
Lynwood	1.003	1.089	1.096	1.102	1.109	1.115	1.122	1.129	1.136	1.142	1.149	1.156	1.163	1.169	1.176	1.182	1.189
Lyons	1.025	1.025	1.026	1.027	1.029	1.030	1.031	1.032	1.033	1.035	1.036	1.037	1.039	1.041	1.043	1.044	1.046
Madden Mental Health Center	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040
Markham	1.381	1.390	1.399	1.408	1.417	1.426	1.435	1.443	1.452	1.461	1.470	1.479	1.488	1.497	1.506	1.515	1.524
Matteson	2.132	2.209	2.286	2.363	2.440	2.517	2.594	2.671	2.749	2.826	2.903	2.980	3.057	3.134	3.211	3.288	3.365
Maywood	3.398	3.396	3.393	3.391	3.388	3.386	3.383	3.381	3.378	3.376	3.373	3.371	3.368	3.366	3.363	3.361	3.358
McCook	1.637	1.638	1.639	1.640	1.641	1.642	1.643	1.644	1.645	1.646	1.647	1.648	1.649	1.650	1.652	1.653	1.654
Melrose Park	3.909	3.910	3.911	3.911	3.912	3.913	3.913	3.914	3.915	3.916	3.916	3.917	3.918	3.918	3.919	3.920	3.921
Merrionette Park	0.232	0.233	0.233	0.234	0.234	0.235	0.235	0.236	0.236	0.237	0.238	0.238	0.239	0.239	0.240	0.240	0.241
Midlothian	1.584	1.594	1.604	1.614	1.624	1.634	1.644	1.654	1.664	1.674	1.684	1.694	1.705	1.715	1.725	1.735	1.745
Mission Brook Sanitary District	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
Mokena	2.189	2.293	2.419	2.544	2.670	2.795	2.921	2.942	2.962	2.983	3.003	3.024	3.045	3.066	3.088	3.109	3.130
Morton Grove	3.374	3.399	3.423	3.448	3.472	3.497	3.521	3.546	3.570	3.595	3.619	3.644	3.668	3.693	3.717	3.742	3.766
Mount Prospect	4.465	4.477	4.488	4.500	4.512	4.524	4.536	4.548	4.560	4.572	4.584	4.596	4.608	4.620	4.632	4.644	4.656
Mundelein	2.887	2.916	2.944	2.973	3.001	3.030	3.058	3.087	3.115	3.144	3.172	3.201	3.229	3.258	3.286	3.315	3.343
Naperville	18.515	18.803	19.091	19.379	19.667	19.955	20.243	20.531	20.819	21.107	21.395	21.683	21.971	22.259	22.547	22.835	23.123
New Lenox	2.447	2.594	2.742	2.889	3.037	3.184	3.332	3.479	3.627	3.774	3.922	4.069	4.217	4.364	4.512	4.659	4.807
Niles	4.754	4.932	4.943	4.954	4.966	4.977	4.988	4.999	5.010	5.022	5.033	5.044	5.055	5.066	5.078	5.089	5.100
Norridge	1.912	1.914	1.916	1.917	1.919	1.921	1.922	1.924	1.925	1.927	1.929	1.930	1.932	1.933	1.935	1.937	1.938
North Chicago	4.920	4.979	5.038	5.096	5.155	5.214	5.273	5.331	5.390	5.449	5.508	5.566	5.625	5.684	5.742	5.801	5.860
North Riverside	1.003	1.005	1.006	1.008	1.010	1.011	1.013	1.015	1.017	1.018	1.020	1.022	1.023	1.025	1.027	1.028	1.030
Northbrook	5.945	6.002	6.059	6.116	6.173	6.229	6.286	6.343	6.400	6.457	6.514	6.571	6.628	6.684	6.741	6.798	6.855
Northfield	1.050	1.053	1.057	1.060	1.064	1.067	1.070	1.074	1.077	1.081	1.084	1.088	1.091	1.094	1.098	1.101	1.105
Northlake	2.640	2.889	2.964	3.039	3.115	3.190	3.265	3.270	3.274	3.279	3.283	3.288	3.293	3.297	3.302	3.306	3.311
Oak Brook	4.175	4.205	4.235	4.265	4.294	4.324	4.354	4.385	4.416	4.446	4.477	4.508	4.522	4.536	4.551	4.565	4.579
Oak Forest	2.961	2.981	3.002	3.022	3.043	3.063	3.084	3.104	3.125	3.145	3.165	3.186	3.206	3.227	3.247	3.268	3.288
Oak Forest Hospital	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
Oak Lawn	7.055	7.082	7.109	7.136	7.163	7.190	7.217	7.243	7.269	7.295	7.321	7.347	7.363	7.380	7.397	7.414	7.431
Oak Park	5.876	5.881	5.887	5.892	5.898	5.903	5.909	5.914	5.920	5.925	5.931	5.936	5.941	5.946	5.950	5.955	5.960
Oakbrook Terrace	0.232	0.281	0.283	0.286	0.288	0.291	0.293	0.293	0.293	0.293	0.293	0.293	0.293	0.293	0.293	0.293	0.293
Olympia Fields	0.787	0.828	0.841	0.854	0.867	0.880	0.893	0.900	0.908	0.915	0.923	0.930	0.943	0.956	0.969	0.982	0.995
Orland Park	7.991	8.099	8.208	8.316	8.425	8.533	8.642	8.750	8.859	8.968	9.076	9.185	9.293	9.402	9.510	9.619	9.727
Palatine	7.776	7.807	7.838	7.870	7.901	7.933	7.964	7.995	8.027	8.058	8.090	8.121	8.152	8.184	8.215	8.246	8.278
Palos Heights	2.028	2.043	2.057	2.072	2.087	2.102	2.116	2.131	2.146	2.160	2.175	2.190	2.204	2.219	2.234	2.249	2.263
Palos Hills	1.964	1.967	1.971	1.974	1.977	1.981	1.984	1.988	1.991	1.995	1.998	2.001	2.005	2.008	2.012	2.015	2.019
Palos Park	0.559	0.572	0.585	0.597	0.610	0.623	0.635	0.648	0.661	0.673	0.686	0.699	0.711	0.724	0.737	0.749	0.762
Park City	0.592	0.593	0.595	0.596	0.597	0.599	0.600	0.602	0.603	0.605	0.606	0.607	0.609	0.610	0.612	0.613	0.615
Park Ridge	4.895	4.898	4.901	4.904	4.907	4.911	4.914	4.917	4.920	4.923	4.926	4.929	4.932	4.935	4.938	4.942	4.945
Phoenix	0.196	0.198	0.199	0.200	0.202	0.203	0.204	0.206	0.207	0.209	0.210	0.211	0.213	0.214	0.216	0.217	0.218
Plainfield	5.450	5.950	6.448	6.946	7.444	7.942	8.440	8.938	9.436	9.934	10.432	10.930	11.096	11.262	11.428	11.594	11.760
Posen	0.491	0.495	0.499	0.503	0.507	0.511	0.515	0.519	0.523	0.527	0.531	0.535	0.539	0.543	0.547	0.551	0.555

SYSTEM NAME	Lake Michigan Water Allocations (millions of gallons per day)																
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prospect Heights	0.350	0.407	0.460	0.513	0.567	0.620	0.673	0.698	0.724	0.749	0.775	0.800	0.830	0.860	0.890	0.920	0.950
River Forest	1.631	1.635	1.639	1.643	1.648	1.652	1.656	1.660	1.664	1.668	1.673	1.677	1.678	1.679	1.680	1.681	1.682
River Grove	1.267	1.268	1.269	1.270	1.271	1.272	1.273	1.274	1.275	1.276	1.277	1.278	1.279	1.280	1.281	1.282	1.283
Riverdale	1.600	1.622	1.643	1.665	1.686	1.708	1.729	1.751	1.772	1.794	1.815	1.837	1.837	1.837	1.837	1.837	1.837
Riverside	0.983	0.985	0.986	0.987	0.988	0.990	0.991	0.992	0.993	0.995	0.996	0.997	0.999	1.000	1.001	1.002	1.004
Riverwoods	0.523	0.528	0.533	0.537	0.542	0.547	0.552	0.556	0.561	0.566	0.570	0.575	0.580	0.584	0.589	0.594	0.599
Robbins	1.748	1.755	1.763	1.771	1.778	1.786	1.793	1.801	1.809	1.816	1.824	1.832	1.839	1.847	1.854	1.862	1.870
Rolling Meadows	3.004	3.019	3.034	3.049	3.064	3.079	3.094	3.109	3.124	3.139	3.154	3.169	3.184	3.199	3.214	3.229	3.244
Rosalind Franklin University	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024
Roselle	2.190	2.206	2.221	2.236	2.251	2.266	2.281	2.296	2.311	2.326	2.341	2.357	2.372	2.387	2.402	2.417	2.432
Rosemont	2.241	2.414	2.493	2.572	2.650	2.729	2.808	2.823	2.839	2.854	2.870	2.885	2.901	2.916	2.932	2.947	2.963
Round Lake	1.706	1.753	1.800	1.847	1.894	1.941	1.988	2.039	2.090	2.140	2.191	2.242	2.319	2.396	2.473	2.550	2.627
Round Lake Beach	2.111	2.128	2.145	2.162	2.180	2.197	2.214	2.231	2.249	2.266	2.283	2.300	2.317	2.335	2.352	2.369	2.386
Round Lake Heights	0.197	0.201	0.205	0.208	0.212	0.215	0.219	0.223	0.226	0.230	0.233	0.237	0.241	0.244	0.248	0.251	0.255
Round Lake Park	0.408	0.418	0.429	0.439	0.450	0.460	0.471	0.482	0.492	0.503	0.513	0.524	0.534	0.545	0.556	0.566	0.577
Schaumburg	10.442	10.500	10.557	10.614	10.671	10.728	10.785	10.842	10.899	10.956	11.013	11.071	11.128	11.185	11.242	11.299	11.356
Schiller Park	2.163	2.167	2.171	2.175	2.179	2.183	2.187	2.191	2.195	2.199	2.203	2.207	2.211	2.215	2.219	2.223	2.227
Shorewood*	1.612	1.748	1.883	2.018	2.154	2.289	2.424	2.559	2.694	2.830	2.965	3.100	3.235	3.370	3.506	3.641	3.776
Skokie	10.227	10.283	10.338	10.394	10.449	10.505	10.560	10.616	10.671	10.727	10.782	10.838	10.838	10.838	10.838	10.838	10.838
South Chicago Heights	0.523	0.527	0.531	0.535	0.539	0.542	0.546	0.550	0.554	0.558	0.562	0.566	0.570	0.574	0.578	0.582	0.586
South Holland	2.800	2.816	2.832	2.848	2.863	2.879	2.895	2.911	2.926	2.942	2.957	2.973	2.989	3.005	3.020	3.036	3.052
South Palos Sanitary District	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130
South Stickney Sanitary District	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940
Stickney	1.355	1.356	1.357	1.358	1.360	1.361	1.362	1.363	1.365	1.366	1.367	1.368	1.369	1.371	1.372	1.373	1.374
Stone Park	0.382	0.381	0.380	0.379	0.378	0.377	0.376	0.375	0.374	0.374	0.373	0.372	0.371	0.370	0.369	0.368	0.367
Streamwood	3.528	3.548	3.567	3.587	3.606	3.626	3.645	3.665	3.684	3.704	3.723	3.743	3.763	3.782	3.802	3.821	3.841
Summit	1.212	1.211	1.210	1.208	1.207	1.206	1.205	1.203	1.202	1.200	1.199	1.197	1.196	1.194	1.192	1.190	1.188
Thornton	0.284	0.285	0.286	0.288	0.289	0.291	0.292	0.293	0.295	0.296	0.298	0.299	0.299	0.299	0.299	0.299	0.299
Tinley Park	6.443	6.572	6.709	6.846	6.982	7.119	7.256	7.407	7.558	7.709	7.860	8.011	8.093	8.175	8.256	8.338	8.420
Villa Park	2.140	2.146	2.152	2.158	2.164	2.170	2.176	2.182	2.188	2.194	2.200	2.206	2.214	2.222	2.230	2.239	2.247
Volo*	0.000	0.000	0.000	0.000	0.000	0.000	0.400	0.450	0.502	0.561	0.622	0.678	0.751	0.816	0.900	0.967	1.044
Wauconda*	0.000	0.000	0.000	0.000	0.000	0.000	1.500	1.550	1.590	1.640	1.690	1.740	1.790	1.850	1.900	1.960	2.020
Waukegan	8.863	8.897	8.932	8.966	9.000	9.035	9.069	9.103	9.137	9.172	9.206	9.240	9.274	9.309	9.343	9.377	9.412
Westchester	2.094	2.100	2.107	2.114	2.121	2.128	2.135	2.141	2.148	2.155	2.162	2.169	2.175	2.182	2.189	2.196	2.203
Westmont	2.933	2.945	2.957	2.969	2.981	2.993	3.006	3.018	3.031	3.043	3.056	3.069	3.079	3.090	3.100	3.111	3.121
Wheaton	5.802	5.821	5.840	5.858	5.877	5.896	5.914	5.933	5.952	5.971	5.989	6.008	6.027	6.045	6.064	6.083	6.102
Wheeling	5.022	5.153	5.266	5.380	5.493	5.607	5.720	5.785	5.850	5.915	5.980	6.045	6.091	6.137	6.182	6.228	6.274
Willow Springs	0.642	0.658	0.673	0.689	0.704	0.720	0.736	0.751	0.767	0.782	0.798	0.813	0.829	0.845	0.860	0.876	0.891
Willowbrook	1.249	1.267	1.286	1.304	1.322	1.341	1.359	1.378	1.396	1.415	1.433	1.452	1.470	1.489	1.507	1.526	1.544
Wilmette	3.861	3.866	3.872	3.878	3.884	3.890	3.896	3.902	3.908	3.914	3.920	3.925	3.931	3.937	3.943	3.949	3.955
Winfield	0.993	1.011	1.029	1.047	1.064	1.082	1.100	1.118	1.135	1.153	1.171	1.188	1.206	1.224	1.242	1.259	1.277
Winnetka	2.536	2.548	2.560	2.573	2.585	2.598	2.610	2.622	2.635	2.647	2.660	2.672	2.672	2.672	2.672	2.672	2.672
Winthrop Harbor	0.593	0.604	0.614	0.625	0.636	0.646	0.657	0.669	0.680	0.692	0.704	0.716	0.730	0.743	0.757	0.771	0.784

SYSTEM NAME	Lake Michigan Water Allocations (millions of gallons per day)																
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Wood Dale	*1.607*	*1.613*	*1.620*	*1.627*	*1.633*	*1.640*	*1.647*	*1.653*	*1.660*	*1.667*	*1.673*	*1.680*	*1.687*	*1.693*	*1.700*	*1.707*	*1.713*
Woodridge	*3.816*	*3.876*	*3.936*	*3.996*	*4.057*	*4.117*	*4.177*	*4.237*	*4.298*	*4.358*	*4.419*	*4.479*	*4.479*	*4.479*	*4.479*	*4.479*	*4.479*
Worth	*1.104*	*1.106*	*1.108*	*1.110*	*1.112*	*1.114*	*1.116*	*1.118*	*1.120*	*1.122*	*1.124*	*1.126*	*1.128*	*1.130*	*1.132*	*1.134*	*1.136*
Zion	*2.483*	*2.509*	*2.534*	*2.560*	*2.585*	*2.611*	*2.637*	*2.665*	*2.692*	*2.720*	*2.748*	*2.776*	*2.810*	*2.844*	*2.878*	*2.913*	*2.947*

2026	2027	2028	2029	2030
4.593	4.615	4.637	4.659	4.682
4.703	4.727	4.750	4.773	4.796
2.250	2.340	2.405	2.501	2.600
10.074	10.102	10.131	10.160	10.188
0.389	0.390	0.391	0.392	0.393
1.268	1.285	1.303	1.320	1.338
12.569	12.570	12.570	12.571	12.571
2.136	2.139	2.143	2.146	2.149
2.643	2.647	2.652	2.656	2.660
0.830	0.830	0.830	0.830	0.829
6.463	6.485	6.508	6.530	6.553
3.217	3.244	3.272	3.300	3.327
2.945	2.955	2.964	2.973	2.983
0.020	0.020	0.020	0.020	0.020
2.517	2.519	2.522	2.524	2.526
1.492	1.493	1.495	1.496	1.497
2.231	2.234	2.236	2.238	2.241
5.076	5.094	5.112	5.130	5.148
0.521	0.523	0.525	0.526	0.528
2.566	2.591	2.616	2.641	2.665
5.062	5.072	5.081	5.090	5.100
1.050	1.053	1.056	1.060	1.063
4.828	4.853	4.877	4.902	4.926
0.100	0.100	0.100	0.100	0.100
0.197	0.197	0.198	0.198	0.198
624.703	626.598	628.493	630.388	632.282
6.292	6.321	6.351	6.380	6.409
1.537	1.537	1.537	1.537	1.537
7.093	7.079	7.064	7.049	7.035
0.921	0.926	0.932	0.937	0.942
1.627	1.638	1.650	1.661	1.672
1.022	1.024	1.027	1.029	1.032
1.517	1.525	1.532	1.540	1.548
3.278	3.282	3.285	3.289	3.293
3.210	3.228	3.247	3.265	3.283
0.026	0.026	0.026	0.026	0.026
8.143	8.154	8.166	8.177	8.189
0.663	0.665	0.667	0.669	0.671
3.184	3.186	3.188	3.190	3.192

2026	2027	2028	2029	2030
7.670	7.737	7.804	7.870	7.937
0.345	0.358	0.370	0.383	0.395
0.167	0.174	0.181	0.188	0.195
0.752	0.759	0.767	0.774	0.782
0.193	0.193	0.194	0.194	0.195
0.743	0.745	0.747	0.749	0.751
0.210	0.210	0.210	0.210	0.210
8.114	8.114	8.114	8.114	8.114
4.779	4.784	4.788	4.792	4.797
2.849	2.851	2.853	2.856	2.858
9.612	9.628	9.644	9.661	9.677
2.652	2.651	2.651	2.651	2.651
1.255	1.258	1.262	1.266	1.269
0.495	0.502	0.508	0.515	0.522
2.192	2.196	2.200	2.204	2.208
0.162	0.162	0.163	0.163	0.163
1.180	1.200	1.220	1.240	1.270
5.142	5.151	5.159	5.168	5.177
0.089	0.089	0.090	0.090	0.090
3.276	3.294	3.313	3.331	3.349
0.140	0.140	0.140	0.140	0.140
1.911	1.913	1.915	1.917	1.919
3.043	3.054	3.064	3.075	3.086
13.262	13.415	13.567	13.720	13.872
1.401	1.418	1.434	1.451	1.467
0.087	0.087	0.087	0.087	0.088
0.014	0.014	0.014	0.014	0.014
2.040	2.057	2.073	2.090	2.106
0.398	0.398	0.398	0.398	0.398
5.268	5.316	5.364	5.412	5.460
3.173	3.179	3.185	3.191	3.197
4.214	4.226	4.237	4.248	4.260
0.973	0.973	0.973	0.974	0.974
1.617	1.622	1.627	1.632	1.637
1.436	1.438	1.440	1.442	1.445
5.963	5.976	5.989	6.003	6.016
0.664	0.664	0.664	0.665	0.665
1.224	1.224	1.224	1.224	1.224
3.019	3.034	3.050	3.065	3.081
0.699	0.704	0.708	0.712	0.716
7.103	7.149	7.196	7.242	7.288
0.436	0.436	0.436	0.437	0.437
2.069	2.074	2.080	2.085	2.090

2026	2027	2028	2029	2030
0.065	0.065	0.065	0.065	0.065
0.231	0.235	0.239	0.243	0.247
0.190	0.190	0.190	0.190	0.190
2.214	2.230	2.246	2.262	2.278
0.105	0.105	0.105	0.105	0.105
5.297	5.469	5.641	5.813	5.985
0.603	0.606	0.609	0.612	0.615
0.600	0.600	0.600	0.600	0.600
0.052	0.052	0.053	0.053	0.054
0.379	0.384	0.390	0.395	0.400
0.065	0.065	0.065	0.065	0.065
0.064	0.064	0.064	0.064	0.064
0.700	0.700	0.700	0.700	0.700
0.714	0.714	0.714	0.714	0.714
8.788	8.904	9.019	9.135	9.251
0.080	0.080	0.080	0.080	0.080
0.336	0.336	0.336	0.336	0.336
2.117	2.124	2.130	2.137	2.143
0.023	0.023	0.023	0.023	0.023
1.696	1.708	1.721	1.733	1.746
0.482	0.482	0.482	0.482	0.482
2.023	2.032	2.042	2.051	2.061
1.294	1.297	1.300	1.303	1.305
0.667	0.667	0.667	0.667	0.667
0.920	0.926	0.932	0.938	0.944
0.190	0.190	0.190	0.190	0.190
0.450	0.450	0.450	0.450	0.450
0.883	0.885	0.888	0.890	0.893
3.500	3.500	3.500	3.500	3.500
1.410	1.410	1.410	1.410	1.410
0.075	0.075	0.075	0.075	0.075
4.770	4.792	4.813	4.835	4.857
1.040	1.070	1.100	1.130	1.160
2.646	2.669	2.732	2.775	2.818
4.194	4.209	4.225	4.241	4.257
1.080	1.085	1.090	1.095	1.100
3.218	3.234	3.249	3.265	3.281
1.777	1.792	1.807	1.822	1.837
2.408	2.414	2.419	2.424	2.429
1.390	1.400	1.410	1.420	1.430
3.403	3.426	3.450	3.473	3.497
5.081	5.184	5.286	5.388	5.491
5.416	5.455	5.494	5.533	5.572

2026	2027	2028	2029	2030
0.503	0.585	0.680	0.791	0.920
0.520	0.520	0.520	0.520	0.520
1.196	1.202	1.209	1.216	1.222
1.048	1.050	1.052	1.054	1.055
0.040	0.040	0.040	0.040	0.040
1.532	1.540	1.548	1.556	1.564
3.442	3.519	3.595	3.672	3.748
3.355	3.352	3.350	3.347	3.344
1.655	1.656	1.657	1.658	1.659
3.921	3.921	3.922	3.922	3.923
0.241	0.242	0.242	0.243	0.243
1.755	1.765	1.775	1.785	1.795
0.275	0.275	0.275	0.275	0.275
3.152	3.174	3.196	3.218	3.240
3.789	3.812	3.835	3.857	3.880
4.667	4.678	4.689	4.700	4.711
3.372	3.400	3.429	3.457	3.486
23.410	23.698	23.985	24.273	24.560
4.954	5.102	5.249	5.397	5.544
5.109	5.118	5.128	5.137	5.146
1.939	1.940	1.941	1.942	1.944
5.918	5.977	6.035	6.094	6.152
1.032	1.033	1.035	1.037	1.038
6.911	6.966	7.022	7.077	7.133
1.108	1.111	1.114	1.117	1.120
3.315	3.320	3.324	3.329	3.333
4.598	4.618	4.637	4.656	4.675
3.309	3.329	3.349	3.370	3.390
0.300	0.300	0.300	0.300	0.300
7.445	7.460	7.474	7.489	7.503
5.965	5.969	5.974	5.979	5.983
0.293	0.293	0.293	0.293	0.293
1.007	1.020	1.032	1.045	1.057
9.836	9.944	10.053	10.161	10.270
8.309	8.341	8.372	8.403	8.435
2.278	2.293	2.307	2.322	2.337
2.022	2.025	2.029	2.032	2.036
0.775	0.787	0.800	0.813	0.825
0.616	0.617	0.619	0.620	0.622
4.947	4.950	4.952	4.955	4.957
0.220	0.221	0.222	0.223	0.224
11.926	12.092	12.258	12.424	12.590
0.559	0.562	0.566	0.570	0.574

2026	2027	2028	2029	2030
0.964	0.978	0.992	1.006	1.020
1.683	1.684	1.685	1.686	1.687
1.284	1.285	1.286	1.287	1.287
1.837	1.837	1.837	1.837	1.837
1.005	1.006	1.007	1.008	1.010
0.603	0.608	0.613	0.617	0.622
1.877	1.885	1.892	1.900	1.907
3.258	3.272	3.286	3.300	3.314
0.024	0.024	0.024	0.024	0.024
2.447	2.462	2.477	2.493	2.508
2.978	2.994	3.009	3.025	3.040
2.704	2.781	2.858	2.935	3.012
2.403	2.419	2.436	2.452	2.469
0.259	0.262	0.266	0.269	0.273
0.587	0.598	0.608	0.619	0.629
11.412	11.468	11.524	11.580	11.636
2.231	2.234	2.238	2.241	2.245
3.911	4.046	4.182	4.317	4.452
10.838	10.838	10.838	10.838	10.838
0.590	0.594	0.598	0.602	0.605
3.068	3.084	3.099	3.115	3.131
0.130	0.130	0.130	0.130	0.130
2.940	2.940	2.940	2.940	2.940
1.375	1.376	1.378	1.379	1.380
0.366	0.365	0.364	0.364	0.363
3.860	3.880	3.899	3.919	3.938
1.187	1.185	1.183	1.181	1.179
0.299	0.299	0.299	0.299	0.299
8.506	8.592	8.677	8.763	8.849
2.254	2.262	2.269	2.277	2.284
1.112	1.191	1.260	1.341	1.410
2.070	2.130	2.200	2.260	2.320
9.445	9.478	9.512	9.545	9.579
2.208	2.214	2.220	2.225	2.231
3.132	3.142	3.152	3.163	3.173
6.120	6.137	6.155	6.173	6.191
6.292	6.311	6.329	6.348	6.366
0.907	0.922	0.938	0.954	0.969
1.563	1.581	1.600	1.618	1.636
3.960	3.965	3.970	3.975	3.980
1.295	1.313	1.330	1.348	1.366
2.672	2.672	2.672	2.672	2.672
0.798	0.812	0.825	0.839	0.852

2026	2027	2028	2029	2030
1.720	*1.727*	*1.733*	*1.740*	*1.747*
4.479	*4.479*	*4.479*	*4.479*	*4.479*
1.137	*1.139*	*1.140*	*1.141*	*1.142*
2.980	*3.014*	*3.047*	*3.080*	*3.114*

Appendix 2

Well 1 Information

Well 2 Information

Well 3 Information

Well 4 Information

Well 5 Information

Miscellaneous Well Information

Robinson ENGINEERING 75

Municipal Expertise. Community Commitment.

Well 1 Information

Robinson ENGINEERING 75

Municipal Expertise. Community Commitment.

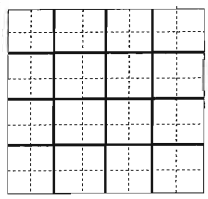
ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Silurian	10	
Maquoketa	435	
Total Depth		455

Survey Sample Study filed
Sample set # 41239 (0' - 455') Received: August 25, 1961

Permit Date: **Permit #:**

COMPANY Wehling Well Works Inc.
FARM Glenwood Manor Sub
DATE DRILLED August 1, 1961 **NO.**
ELEVATION 625GL **COUNTY NO.** 00423
LOCATION 2750'N line, 142'W line of section
LATITUDE 41.549812 **LONGITUDE** -87.635658
COUNTY Cook **API** 120310042300 **4 - 35N - 14E**



SPECIFICATION FOR WATER TREATMENT

Glenwood, Illinois
Cook County

Purpose: To provide for the fluoridation of the public water supply to bring the fluorine content up to 0.9 - 1.2 ppm as needed.

Equipment: Precision modified positive pressure diaphragm type 12101-11M proportional pump, capable of operating against 80 psi with a range of 0.3 to 38.0 gpd and of being adjusted while in operation shall be installed at well #4 as indicated on attached drawing. This unit is to be equipped with a 3/4" corporation cock and PVC injection tube having a safety lock, back check valve and anti-syphon valve.

The pump is to be mounted on a 10"x12" shelf, 42" above the floor and directly over a drum of diluted hydrofluosilicic acid having a tight cover from which it will take suction. A 110V electric outlet shall be wired in on single phase with the well circuit so that every time the well operates the Precision pump will provide chemical treatment. a 1/4" OD poly vent tube shall be extended from the drum to the outside of the building.

Operator's safety equipment consisting of rubber gloves, rubber apron and goggles are to be provided at a location adjacent to the fluoridation unit.

A Hach colorimeter with a liberal supply of reagents and glassware shall be provided.

Records: Records of the hydrofluosilicic acid application together with tests for same shall be kept in a style approved by local and State Health authorities.

Comments: Wells #1 and #2 which have a natural fluoride content of 0.4 ppm will be placed on emergency reserve service because of their low gpm about July 1st, 1968. At that time the new well #3 with a gpm of 950 and a natural F of 1.4 ppm will be placed into routine service. The above treatment provisions therefore exclude wells #1 and #2.

cc: Cook County Public Health Unit

(7-134

March 19, 1970
Glenwood
Illinois

Mr. Carl L. Sebelius, D.D.S., Chief
Division of Dental Health
Department of Public Health
Springfield, Illinois

Dear Sir:

RE: Water Fluoridation
of Glenwood

In our capacity of Village Engineer for the Village of Glenwood, we have been requested to reply to your letter received March 2nd referring to fluoridation of water.

After having obtained Permit No.61-1969 (copy attached) to provide necessary equipment for the shallow wells in Glenwood (No's. 1, 2 and 4) which did not meet minimum fluoride content, the Village embarked upon installation of a new 1,000 gpm deep well, well pump and iron removal plant, the well showing a content of fluoride sufficient to meet requirements (copy of analysis attached). Since the new deep well in conjunction with the existing deep well number 3 are to constitute the supply system for all periods for some time to come, shallow wells 1, 2 and 4 are to be used only in extreme emergency, the Village felt installation of fluoride equipment to be unnecessary. At present well no.3 (with iron removal plant) provides the entire supply except during extreme emergency. In any event, well no.3, presently supplies approximately 90% of the annual use.

It is anticipated the iron removal plant number 2 at the new well site will be completed within the next five months. It is also anticipated that future water supply requirements will be from deep well source with similar fluoride content.

STATE OF ILLINOIS
DEPARTMENT OF
REGISTRATION AND EDUCATION
JOHN C. WATSON,
DIRECTOR, SPRINGFIELD
BOARD OF
NATURAL RESOURCES
AND CONSERVATION
JOHN C. WATSON . . . . CHAIRMAN
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GEOLOGY . . . . LAURENCE L. SLOSS
SOUTHERN ILLINOIS UNIVERSITY . . .
PRESIDENT DELYTE W. MORRIS
UNIVERSITY OF ILLINOIS . . . . . .
DEAN WILLIAM L. EVERITT

Illinois State Water Survey

WATER RESOURCES BUILDING * MAIL: BOX 232, URBANA, ILLINOIS 61801 * AREA CODE 217
605 E. SPRINGFIELD, CHAMPAIGN PHONE 333-4810

WILLIAM C. ACKERMANN, CHIEF

October 13, 1967

PARTIAL CHEMICAL ANALYSIS

Sample of water collected from Well No. 1 owned by the Village of Glenwood, Illinois in Cook County. Location of well: 2750'S, and 142'E of the NW corner of Section 4, T35N, R14E. Depth of well: 455 feet.

LABORATORY NO. 173147

		ppm.	epm.			ppm.	epm.
Iron(total)	Fe	1.4		Fluoride	F	0.4	
Manganese	Mn	.00		Chloride	Cl	155.	4.37
				Nitrate	NO_3	0.0	.00
				Alkalinity	(as $CaCO_3$)	352.	7.04
Turbidity		2		Hardness	(as $CaCO_3$)	895.	17.90
Color		0					
Odor		0					
Temp.(reported)		54°F		Total Dissolved Minerals		1340.	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

ILLINOIS STATE WATER SURVEY

Laurel M. Hanley
Associate Chemist

LMH/bb

STATE OF ILLINOIS
DEPARTMENT OF REGISTRATION AND EDUCATION
JOHN C. WATSON, DIRECTOR, SPRINGFIELD

BOARD OF NATURAL RESOURCES AND CONSERVATION
JOHN C. WATSON, CHAIRMAN
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GEOLOGY - LAURENCE L. SLOSS
SOUTHERN ILLINOIS UNIVERSITY - PRESIDENT DELYTE W. MORRIS
UNIVERSITY OF ILLINOIS - DEAN WILLIAM L. EVERITT

Illinois State Water Survey

WATER RESOURCES BUILDING
605 E. SPRINGFIELD, CHAMPAIGN
MAIL: BOX 232 URBANA ILLINOIS 61801
AREA CODE 217
PHONE 333-2210

WILLIAM C. ACKERMANN, CHIEF

October [illegible], 1967

Mr. Louis Komor
Water Superintendent
Glenwood, Illinois

Dear Mr. Komor:

We are enclosing copies of the partial analyses made on samples of water collected September 29, 1967 from the four wells owned by the Village of Glenwood.

The sample from Well No. 1 is shown by the analysis to contain less iron but a higher sulfate content (calculated value not shown on the analysis), alkalinity, Hardness, and total mineral content than a previous sample from this well (Lab. No 167074).

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The sample from Well No. 4 is shown by the analysis to be generally similar in mineral constituents to a previous sample from Well No. 4 (Lab. No [illegible]). [illegible] note, however that this sample contains a little [illegible] total mineral content than the previous sample.

[illegible] yours,
[illegible] WATER SURVEY

[illegible]

LMH/[illegible]
Enc[illegible]
cc: [illegible]

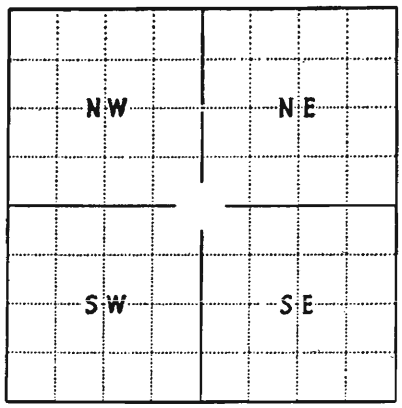
Form 06-6 (66772—10M—7-75)

STATE OF ILLINOIS
County of Will } ss.

WATER WELL PLUGGING AFFIDAVIT

_____ and

Raymond Hibner, being first duly sworn, do depose and say the following is a true and correct statement of the details of the plugging of a certain well drilled for water and located as follows:



Locate well accurately on plat of section
(Scale one inch—2,000 ft.)

Location in section 142'E 46'N SWc NW
Section 4 Township 35N Range 14E
County Cook
Well name and number #1 (187th & Halsted)
Year drilled 1961
Reason for plugging Lake Michigan water
Total depth 455 Formation rock
How was depth determined? As reported _____
As measured x
Diameter of well at land surface 13¼" inches
Was well clear of obstructions to bottom before plugging? yes
Depth of obstruction _____. Nature of obstruction _____

Drilling permit No. and date, if known _____
Permit issued to _____
Kind of drilling tools used _____ Date plugging completed October 7, 1987
Property owner Village of Glenwood Address Glenwood, Ill.
Drilling contractor Wehling Well Work, Inc Address P.O. Box 488, Beecher, Ill.

DETAILS OF PLUGGING

Filled with	Washed pea gravel (Cement or other Materials)	From	455	To	50 feet
Kind of plug	Neat Cement	From	50	To	surface feet
Filled with		From		To	feet
Kind of plug		From		To	feet
Filled with		From		To	feet
Kind of plug		From		To	feet

CASING RECORD

IN WELL Diameter (In.)	From (Ft.)	To (Ft.)	PULLED OUT From (Ft.)	To (Ft.)	REMARKS

_____
(Signature of person, firm or corporation having custody or control of well.)

Per _____

Address _____

Raymond F. Wilmer
(Signature and title of party supervising plugging of well.)

Address RR 1 Elwood Ill 60421

Subscribed and sworn to before me this 28th day of January A.D. 1988.

My commission expires _____.

OFFICIAL SEAL
BETTY KROHN
NOTARY PUBLIC STATE OF ILLINOIS
MY COMMISSION EXP. JUNE 21, 1991

Betty Krohn
Notary Public

Well 2 Information

Robinson ENGINEERING 75

Municipal Expertise. Community Commitment.

ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Silurian	16	
Total Depth		427
Survey Sample Study filed		
Sample set # 43267 (0' - 426.5') Received: December 11, 1962		

Permit Date: **Permit #:**

COMPANY Wehling Well Works Inc.

FARM Glenwood Village

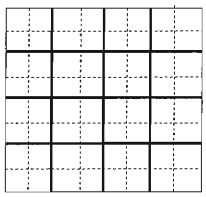
DATE DRILLED October 1, 1962 **NO.** 2

ELEVATION 629GL **COUNTY NO.** 00459

LOCATION 2700'N line, 1100'E line of section

LATITUDE 41.549932 **LONGITUDE** -87.640214

COUNTY Cook **API** 120310045900 **5 - 35N - 14E**



6-134

March 19, 1970

Glenwood Illinois

Mr. Carl L. Sebelius, D.D.S.,Chief
Division of Dental Health
Department of Public Health
Springfield, Illinois

Dear Sir:

RE: Water Fluoridation
of Glenwood

In our capacity of Village Engineer for the Village of Glenwood, we have been requested to reply to your letter received March 2nd referring to fluoridation of water.

After having obtained Permit No.61-1969 (copy attached) to provide necessary equipment for the shallow wells in Glenwood (No's. 1, 2 and 4) which did not meet minimum fluoride content, the Village embarked upon installation of a new 1,000 gpm deep well, well pump and iron removal plant, the well showing a content of fluoride sufficient to meet requirements (copy of analysis attached). Since the new deep well in conjunction with the existing deep well number 3 are to constitute the supply system for all periods for some time to come, shallow wells 1, 2 and 4 are to be used only in extreme emergency, the Village felt installation of fluoride equipment to be unnecessary. At present well no.3 (with iron removal plant) provides the entire supply except during extreme emergency. In any event, well no.3, presently supplies approximately 90% of the annual use.

It is anticipated the iron removal plant number 2 at the new well site will be completed within the next five months. It is also anticipated that future water supply requirements will be from deep well source with similar fluoride content.

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DEPARTMENT OF REGISTRATION AND EDUCATION
JOHN C. WATSON, DIRECTOR, SPRINGFIELD

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Illinois State Water Survey

WATER RESOURCES BUILDING
605 E. SPRINGFIELD, CHAMPAIGN
MAIL: BOX 232 URBANA, ILLINOIS 61801
AREA CODE 217
PHONE 333-2210

WILLIAM C. ACKERMANN, CHIEF

October 13, 1967

Mr. Louis Komor
Water Superintendent
Glenwood, Illinois

Dear Mr. Komor:

We are enclosing copies of the partial analyses made on samples of water collected September 29, 1967 from the four wells owned by the Village of Glenwood.

The sample from Well No. 1 is shown by the analysis to contain less iron but a higher sulfate content (calculated value not shown on the analysis), alkalinity, Hardness, and total mineral content than a previous sample from this well (Lab. No 167074).

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With the exception of the iron content which is somewhat less in the sample from Well No. 3, the analysis shows this sample to be generally similar in mineral composition to a sample previously analyzed from Well No. 3 (Lab. No. [illegible])

The sample from Well No. 4 is shown by the analysis to be generally similar in mineral constituents to a previous sample from Well No. 4 (Lab. No [illegible]). [illegible] note however that this sample contains a little [illegible] total mineral content than the previous sample.

[illegible] yours,
[illegible] WATER SURVEY

[illegible]

LMH[illegible]
Enc[illegible]
cc[illegible]

71-187

OFFICE PHONES
946-2244
946-2245

CHICAGO HEIGHTS PHONE
754-4240

ILLINOIS STATE WATER WELL LICENSE NO. 92-54

RES. PHONES
E. C. WEHLING—946-2388
W. E. WEHLING—946-2192
R. H. WEHLING—946-2464

WEHLING WELL WORKS, INC.

Well Drilling Contractor

PUMP SALES & SERVICE • ACCESSORIES
WATER SOFTENERS • APPLIANCES
LOCATED 1½ BLOCKS EAST OF RT. 1 ON INDIANA
MAILING ADDRESS - P.O. BOX 488
BEECHER, ILLINOIS 60401

January 11, 1972

Village of Glenwood
Glenwood, Illinois

Attn: Mr. Louis Homer, Water Supt.

We take pleasure in submitting the following quotation covering repairs to Well pump #2.

1 - 6" William Vogel check valve	$262.00
1 - 14 Naco 7 00 bowl assembly (Capacity 170 GPM @ 270')	1055.00
1 - 1" #416 stainless steel shaft with "J" & pr sleeve.	56.00
1 - 1" #416 stainless steel shaft coupling	8.00
17 - 5"x9'11½" column pipe @ 53.00	901.00
2 - 5"x1'11" column pipe @ 38	76.00
18 - 5"x1" bronze bearing retainers complete with rubber bearings 17.00	306.00
1 - 1" #416 stainless steel head shaft	75.00
1 - Set of 1" packing.	3.00
1 - 5" x 10' suction pipe.	36.00
1 - 5" wire wound galvanized cone strainer.	20.00
140' - ¾" double braided rubber air line	51.00
	$2823.00

Labor and equipment to pull pump and inspect was $300.00 and labor and equipment for installation of the above will also be $300.00 as previously mentioned.

Delivery on new bowls is about 3 weeks.

Very truly yours,
WEHLING WELL WORKS, INC.

Wendell E. Wehling, Vice President

WEW:bk

GR. 129

SPECIFICATION FOR WATER TREATMENT

Glenwood, Illinois
Cook County

Purpose: To provide for the fluoridation of the public water supply to bring the fluorine content up to 0.9 - 1.2 ppm as needed.

Equipment: Precision modified positive pressure diaphragm type 12101-11M proportional pump, capable of operating against 80 psi with a range of 0.3 to 38.0 gpd and of being adjusted while in operation shall be installed at well #4 as indicated on attached drawing. This unit is to be equipped with a 3/4" corporation cock and PVC injection tube having a safety lock, back check valve and anti-syphon valve.

The pump is to be mounted on a 10"x12" shelf, 42" above the floor and directly over a drum of diluted hydrofluosilicic acid having a tight cover from which it will take suction. A 110V electric outlet shall be wired in on single phase with the well circuit so that every time the well operates the Precision pump will provide chemical treatment. a 1/4" OD poly vent tube shall be extended from the drum to the outside of the building.

Operator's safety equipment consisting of rubber gloves, rubber apron and goggles are to be provided at a location adjacent to the fluoridation unit.

A Hach colorimeter with a liberal supply of reagents and glassware shall be provided.

Records: Records of the hydrofluosilicic acid application together with tests for same shall be kept in a style approved by local and State Health authorities.

Comments: Wells #1 and #2 which have a natural fluoride content of 0.4 ppm will be placed on emergency reserve service because of their low gpm about July 1st, 1968. At that time the new well #3 with a gpm of 950 and a natural F of 1.4 ppm will be placed into routine service. The above treatment provisions therefore exclude wells #1 and #2.

cc: Cook County Public Health Unit

Well 3 Information

Robinson ENGINEERING 75

Municipal Expertise. Community Commitment.

ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Silurian	40	
Maquoketa	482	
Galena	665	
St Peter	989	
Eau Claire	1788	
Total Depth		1789

Driller's Log filed

Sample set # 47051 (0' - 1790') Received: March 13, 1964

Permit Date: **Permit #:**

COMPANY Wehling Well Works Inc.

FARM Glenwood Village

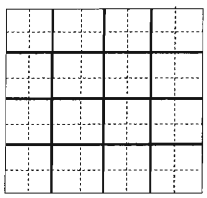
DATE DRILLED February 1, 1964 **NO.** 3

ELEVATION 618GL **COUNTY NO.** 00363

LOCATION 1550'S line, 1700'E line of SE

LATITUDE 41.546873 **LONGITUDE** -87.603379

COUNTY Cook **API** 120310036300 **3 - 35N - 14E**



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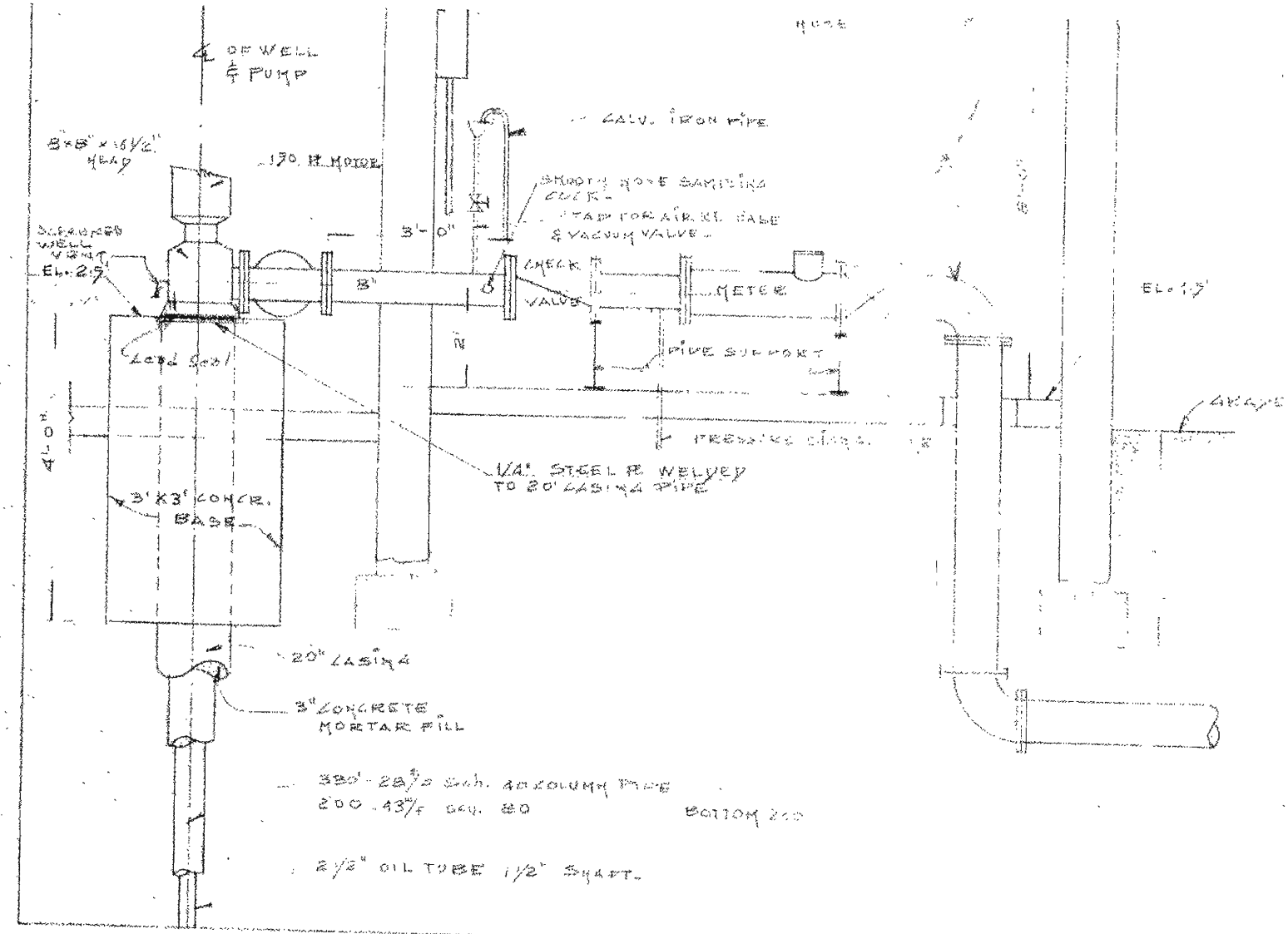
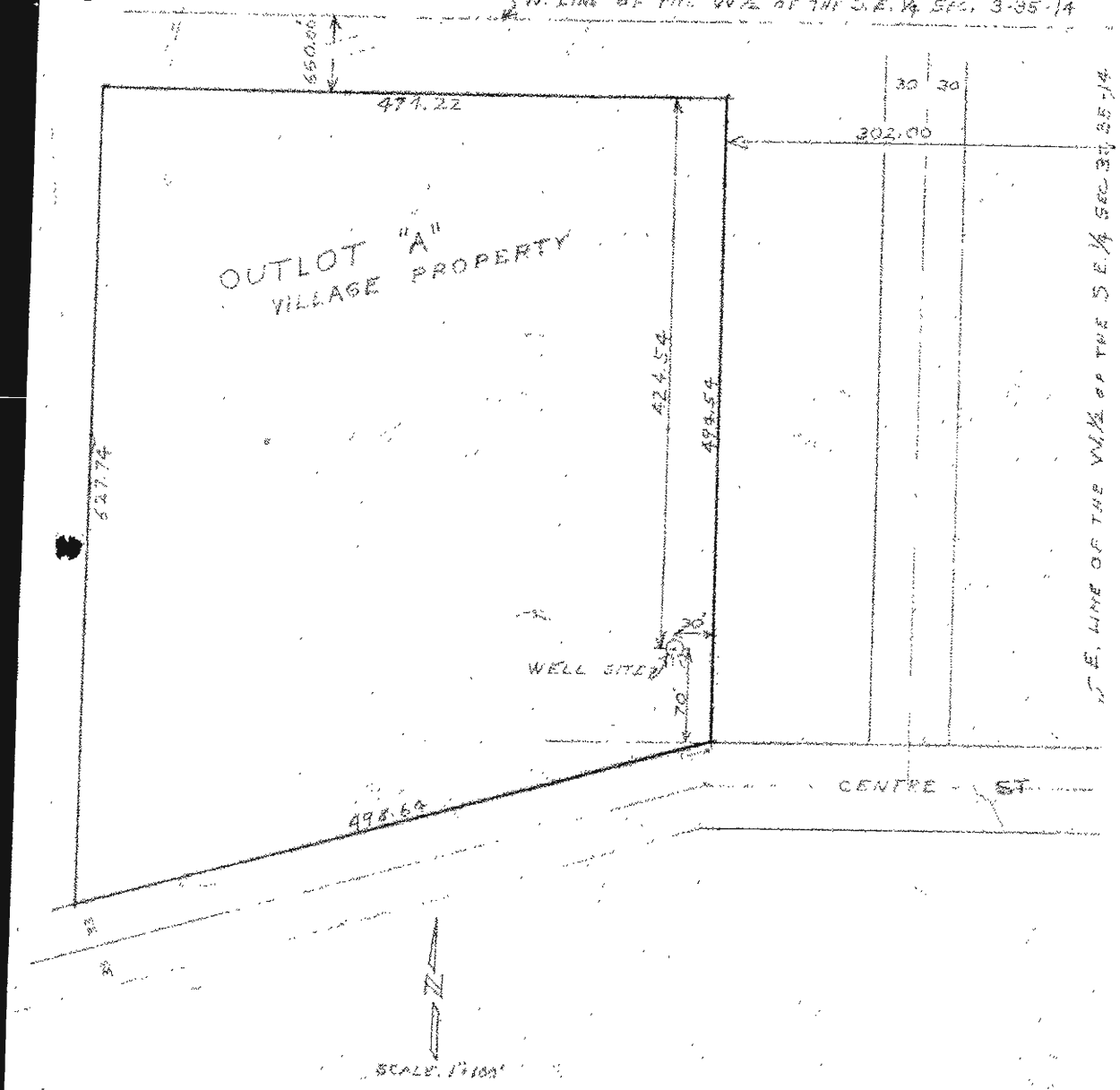

4" DIA WELL & PUMP
8"x8"x16½" HEAD
170. ft. HOSE
GALV. IRON PIPE
SAMPLING COCK
TAP FOR AIR & VACUUM VALVE
3'-0"
SCREENED WELL VENT
EL. 2.5'
CHECK VALVE
METER
PIPE SUPPORT
Lead Seal
PRESSURE GAUGE
4'-0"
1/4" STEEL R. WELDED TO 20" CASING PIPE
3'X3' CONCR. BASE
20" CASING
3" CONCRETE MORTAR FILL
330'-2½" Sch. 40 ALUMINUM PIPE
200'-4¾" GALV. 80
BOTTOM
2½" OIL TUBE 1½" SHAFT.
HOSE
EL. 1.5'
4 GUYS

LOCATION PLAN
WELL NO. 3 VILLAGE OF GLENWOOD



FY. FY 1971
8-18-70

August 1, 1967

Mr. Harold W. FitzHenry, President
Village of Glenwood
North Rebecca Street
Glenwood, Illinois

Dear President FitzHenry:

RE: Utilization of Well No.3
and Water Treatment

In accordance with your request, we offer the following information with reference to utilizing well no.3 as the primary well along with iron removal or both iron removal and softening.

PRIMARY WELL SOURCE:

It is quite obvious that the continued growth of the village and associated increase in water demand will in the very near future, if not this year already, exceed the capacity of well no.4 as primary supply.

Since mixing of waters and continued reversal of flow as is the operating necessity in a system utilizing elevated tanks does cause agitation of iron deposits in the mains and associated "red water" conditions we recommend that a single primary source be utilized along with treatment at least for iron removal. Since well no.3 has a deliverable capacity of almost 1.5 million gallons per day and is presently fitted with a pump rated in excess of 1 million gallons per day, we recommend that it be utilized as the main supply well. We also recommend that well no.4 be maintained as is, for secondary

source adding only poly-phosphate treatment to sequester iron when in service.

TREATMENT:

The analysis of water from well no. 3 indicates a water hardness of 45 grains and an iron content of 2.1 parts per million. To utilize well no 3 iron removal is definitely recommended and if financially feasible, softening should be included

(a) Iron Removal:

Iron removal may be effected in one of two ways (1) Aerator and sand and gravel filters or (2) by applying potassium permanganate and using pressure filters. Although operating cost is less, the first method however requires construction of a collection basin or clear well and re-pumping facilities in addition to the iron removal equipment (aerator-4-10 foot diameter sand and gravel filters). The second method (consisting of Chemical Feed Unit and 4-10 foot diameter Pressure Filters) therefore is more commonly used today and appears is the more desirable of the two methods With either method, housing of filters and associated equipment must be provided. Housing for aeration method requires a slightly larger building to provide for secondary pumping equipment. A building of 1,250 sq.ft.is required. For the pressure filter method a building of approximately 1,000 sq.ft. is required. To also provide for softening equipment as described below an additional 500 sq.ft.are required.

(b) Softening:

On the basis of 800 gallon per minute flow and a 6 to 7 grain effluent, softening can be provided by installation of 3-fully automated, 8'-0"diameter, 140 cu.ft. Manganese Zeolite softeners.

Estimated Cost of Installation:

Iron Removal by Aeration:

Blower and Aerator (800 GPM)	$10,000.00
4-10'diameter Sand and Gravel Filters	31,000.00
Clear Well	3,000.00
Secondary pumping units incl. electric, etc.	5,000.00
Building	15,000.00
	$64,000.00
Engineering, Supervision and Inspection	5,700.00
Total estimated cost	$69,700.00

Iron Removal by Pressure Filter System:

Chemical Feeder	$ 2,500.00
4-10'-0"diameter Pressure Filters	40,000.00
Building (50' x 20')	15,000.00
	$57,500.00
Engineering, Supervision and Inspection	5,200.00
Total estimated cost	$62,700.00

Softening Equipment:

3-8'diameter, 140 cu.ft. Softeners	$30,000.00
Additional building area (50' x 10')	7,500.00
Brine Storage Tank and associated equipment	5,000.00
	$42,500.00
Engineering, Supervision and Inspection	4,500.00
Total estimated cost	$47,000.00

Estimated Operational Cost:

Based upon operation at 800,000 gallons per day and 800 gallons per minute rate and assuming approximately 2 man hours attendance per day we estimate operational cost of treatment per thousand gallons as follows:

(a) Iron removal by aeration:

Power (re-pumping)	$0.03
Filter Wash Water	0.01
Labor	0.01
	$0.05

(b) Iron Removal by Pressure Filter:

Power	$0.01	0.02
Potassium Permanganate	0.05	← 0.008
Labor	0.01	.01
Wash Water, etc.	0.01	0.004
	$0.08	0.04
		0.05

(c) Softening by Manganese-Zeolite Units:

Salt	$0.11
Labor	0.01
Backwash and Rinse Water etc.	0.02
	$0.14

Therefore in order to provide iron removal and softening for well no.3 the operating cost will be approximately $0.22 higher. The cost of financing construction by revenue bond with 150% cover is approximately $0.04 per thousand gallons thereby resulting in a total additional cost per thousand gallons of approximately $0.26 for complete treatment.

The total additional cost per thousand gallons for iron removal alone is estimated at approximately $0.10.

Please call if you have any questions concerning this report.

Yours very truly,

R. W. ROBINSON and ASSOCIATES CO

ROBERT W. STOHRER, P.E.

RWS/js

6-134

March 19, 1970

Glenwood Illinois

Mr. Carl L. Sebelius, D.D.S.,Chief
Division of Dental Health
Department of Public Health
Springfield, Illinois

Dear Sir:

RE: Water Fluoridation
of Glenwood

In our capacity of Village Engineer for the Village of Glenwood, we have been requested to reply to your letter received March 2nd referring to fluoridation of water.

After having obtained Permit No.61-1969 (copy attached) to provide necessary equipment for the shallow wells in Glenwood (No's. 1, 2 and 4) which did not meet minimum fluoride content, the Village embarked upon installation of a new 1,000 gpm deep well, well pump and iron removal plant, the well showing a content of fluoride sufficient to meet requirements (copy of analysis attached). Since the new deep well in conjunction with the existing deep well number 3 are to constitute the supply system for all periods for some time to come, shallow wells 1, 2 and 4 are to be used only in extreme emergency, the Village felt installation of fluoride equipment to be unnecessary. At present well no.3 (with iron removal plant) provides the entire supply except during extreme emergency. In any event, well no.3, presently supplies approximately 90% of the annual use.

It is anticipated the iron removal plant number 2 at the new well site will be completed within the next five months. It is also anticipated that future water supply requirements will be from deep well source with similar fluoride content.

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DIRECTOR, SPRINGFIELD
BOARD OF
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AND CONSERVATION
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GEOLOGY . . . . LAURENCE L. SLOSS
SOUTHERN ILLINOIS UNIVERSITY . . .
PRESIDENT DELYTE W. MORRIS
UNIVERSITY OF ILLINOIS . . . . . .
DEAN WILLIAM L. EVERITT

Illinois State Water Survey

WATER RESOURCES BUILDING • MAIL: BOX 232, URBANA, ILLINOIS 61801 • AREA CODE 217
605 E. SPRINGFIELD, CHAMPAIGN PHONE 333-2210

WILLIAM C. ACKERMANN, CHIEF

October 13, 1967

PARTIAL CHEMICAL ANALYSIS

Sample of water collected September 29, 1967 from Well No. 3 owned by the Village of Glenwood, Illinois in Cook County. Location of well: 850'N and 1800'W of the SE corner of Section 3, T35N, R14E. Depth of well: 1776 feet.

LABORATORY NO. 173151

		ppm.	epm.			ppm.	epm.
Iron(total)	Fe	1.1		Fluoride	F	1.4	
Manganese	Mn	.00		Chloride	Cl	265.	7.47
C				Nitrate	NO_3	0.0	.00
				Alkalinity	(as $CaCO_3$)	220.	4.40
Turbidity		1		Hardness	(as $CaCO_3$)	770.	15.40
Color		0					
Odor		0					
Temp.(reported)		60°F		Total Dissolved Minerals		1793.	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0565 = grains per U.S. gallon

ILLINOIS STATE WATER SURVEY

LMH/bb

STATE OF ILLINOIS
DEPARTMENT OF REGISTRATION AND EDUCATION
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GEOLOGY - - - - LAWRENCE C. WOOD
SOUTHERN ILLINOIS UNIVERSITY - - -
PRESIDENT DELYTE W. MORRIS
UNIVERSITY OF ILLINOIS - - - - - -
DEAN WILLIAM L. EVERITT

Illinois State Water Survey

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605 E. SPRINGFIELD, CHAMPAIGN PHONE 333-2210

WILLIAM C. ACKERMANN, CHIEF

October 13, 1967

Mr. Louis Komer
Water Superintendent
Glenwood, Illinois

Dear Mr. Komer:

We are enclosing copies of the partial analyses made on samples of water collected September 29, 1967 from the four wells owned by the Village of Glenwood.

The sample from Well No. 1 is shown by the analysis to contain less iron but a higher sulfate content (calculated value not shown on the analysis), alkalinity, Hardness, and total mineral content than a previous sample from this well (Lab. No. 167074).

The sample from Well No. 2 is shown by the analysis to contain less iron but a higher chloride content, sulfate content (not shown), hardness, and total mineral content than a previous sample from Well No. 2 (Lab. No. 167076)

With the exception of the iron content which is somewhat less in the sample from Well No. 3, the analysis shows this sample to be generally similar in mineral content [illegible] to a sample previously analyzed from Well No. 3 (Lab. No. 167077)

The sample from Well No. 4 is shown by the analysis to be generally similar in mineral [illegible] to a previous sample from Well No. 4 (Lab. No. 167078); however, it does show however that this sample contains a little more [illegible] mineral content than the previous sample.

[illegible]
[illegible] WATER SURVEY

LMH/
Enc. [illegible]
cc: [illegible]

Culligan

CULLIGAN WATER CONDITIONING COMPANY 17028 S. OAK PARK AVENUE TINLEY PARK, ILLINOIS
KEllogg 2-4313

September 6, 1967

Mr. Louis Komor
Water Superintendent
Glenwood Municipal Building
Rose and Rebecca Streets
Glenwood, Illinois, 60425,

Dear Mr. Komor:

Enclosed are copies of the alanyses of the raw water supply from Wells # 3 & 4 which I submitted to Culligan, Inc., Northbrook, Illinois, for examination.

You will note that well #3 indicates 1.2 parts per million of flourides and well #4 indicates .4 parts per million.

Well #4 is apparently lower in flourides content than your minimum standards.

It is a pleasure to be of help to you and please feel free to call on the writer at any time he can be of service.

Sincerely yours,

CULLIGAN WATER CONDITIONING

Arthur S. Leonard
Vice-President

ASL:me
encls.

FAMOUS FOR . . .
Culligan Soft Water Service, Culligan Iron Removal Service,
Culligan Automatic Water Softeners and Salt Delivery Service.

WATER ANALYSIS REPORT

Culligan

CULLIGAN INC., NORTHBROOK, ILLINOIS - CRestwood 2-1000 • SAN BERNARDINO, CALIFORNIA - TUrner 7-2557

TO:
Culligan Soft Water Service of Tinley Park
17028 S. Oak Park Ave.
Tinley Park, Illinois 60477

Analysis No. N-209733

File No. 12-636

Sample of: Louis Komer

Source of Water: ---/Well #3

Taken: 4/1/65 Received: 4/2/65

Analyzed: 4/7/65 Typed: 4/9/65

gpg values are as $CaCO_3$ — to convert to ppm (as $CaCO_3$), multiply by 17.1

Sample Description

Turbidity (as received)	Grey 5		Color:	---	
Turbidity (after filtering)	0		Odor:	No	
Total Hardness	44.0	gpg	Compensated Hardness	56.0	gpg
pH	7.6		Nitrate (N)	Absent	
Iron (Fe)	1.2	ppm	Manganese (Mn)	Absent	ppm
Silica (SiO_2)	20+	ppm	Hydrogen Sulfide (H_2S)		ppm
		ppm	Fluoride	1.1	ppm
		ppm			

CATIONS:			ANIONS:		
Calcium	31.2	gpg	Chloride	22.2	gpg
Magnesium	12.8	gpg	Sulfate	42.0	gpg
Sodium & Potassium	34.6	gpg	Nitrate		gpg
		gpg	Hydroxide Alkalinity		gpg
Total Cations	78.6	gpg	Carbonate Alkalinity		gpg
			Bicarbonate Alkalinity	14.4	gpg
Conductivity, micromhos/cm.			Total Anions	78.6	gpg

FOR DI CALCULATIONS:			
Silica	gpg	Loading Factor X	gpg
Carbon Dioxide	gpg	Loading Factor Y	gpg
Alkalinity	%	Loading Factor Z	gpg

REMARKS:

/ct

J. E. Malley
Chemist

STATE OF ILLINOIS
DEPARTMENT OF
REGISTRATION AND EDUCATION
WILLIAM SYLVESTER WHITE,
DIRECTOR, SPRINGFIELD

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DEAN WILLIAM L. EVERITT

Illinois State Water Survey

WATER RESOURCES BUILDING
605 E. SPRINGFIELD, CHAMPAIGN
MAIL: BOX 232, URBANA, ILLINOIS 61802
AREA CODE 217
PHONE 333-2210

WILLIAM C. ACKERMANN, CHIEF

March 24, 1964

PARTIAL CHEMICAL ANALYSIS

Sample of water collected February 15, 1964 from Well No. 3 owned by the Village of Glenwood, Illinois in Cook County. Location of well: 850'N and 1800'W of the SE corner of Section 3, T35N, R14E. Depth of well: 1776 feet. Sample collected 12 hours after pumping began while pumping at a rate of 745 gpm.

LABORATORY NO. 162378

		ppm.	epm.			ppm.	epm.
Iron (total)	Fe	2.1		Fluoride	F	1.4	
Manganese	Mn	.05		Chloride	Cl	265.	7.47
				Nitrate	NO_3	0.8	.01
				Alkalinity	(as $CaCO_3$)	200.	4.00
Turbidity		14		Hardness	(as $CaCO_3$)	773.	15.46
Color		0				452 /m	
Odor		0		Total Dissolved Minerals		1731	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

ILLINOIS STATE WATER SURVEY

Laurel M. Henley
Associate Chemist

LMH/sv

STATE OF ILLINOIS
DEPARTMENT OF
REGISTRATION AND EDUCATION
WILLIAM SYLVESTER WHITE,
DIRECTOR, SPRINGFIELD

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SOUTHERN ILLINOIS UNIVERSITY . . .
PRESIDENT DELYTE W. MORRIS
UNIVERSITY OF ILLINOIS . . . . . .
DEAN WILLIAM L. EVERITT

Illinois State Water Survey

WATER RESOURCES BUILDING
605 E. SPRINGFIELD, CHAMPAIGN
MAIL: BOX 232, URBANA, ILLINOIS 61802
AREA CODE 217
PHONE 333-2210

WILLIAM C. ACKERMANN, CHIEF

March 24, 1964

Water Superintendent
Village Hall
Glenwood, Illinois

Dear Sir:

We are enclosing a copy of the partial analysis made on a sample of water collected February 15, 1964 from well No. 3 owned by the Village of Glenwood.

The analysis shows this sample to be highly mineralized and very hard and to contain considerable iron, sufficient to cause staining of porcelain ware, etc. It is noted that the sample also contains considerable turbidity which appears to be due mostly to the iron content.

The hardness in this sample is sufficient to cause the formation of an exceptionally large amount of hard scale in boilers and hot water heaters and to consume an exceptionally large amount of soap if used for washing or laundry purposes.

Generally speaking, this water would be corrosive, however, the reader should bear in mind that the corrosive properties of a water depends largely on the circumstances under which the water is used.

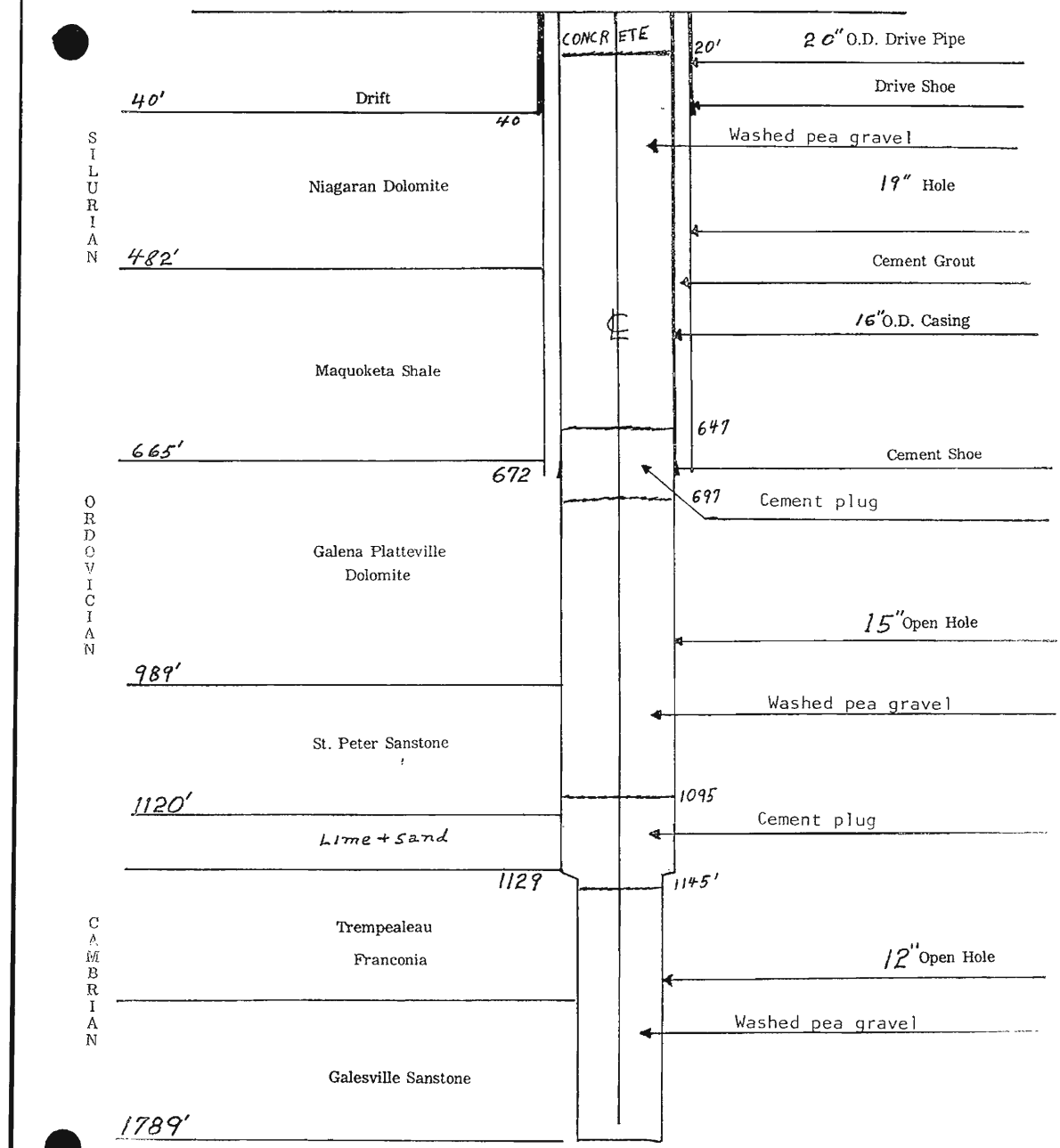
After this well has been in use for several weeks, we would suggest that another sample be submitted for analysis.

Very truly yours,
ILLINOIS STATE WATER SURVEY

Laurel H. Henley

Laurel H. Henley
Associate Chemist

LHH/sv
Enclosure
cc: Wehling Well Works
State Department of Public Health -2
Cook County Health Department
Mr. N. F. Sasman



GLENWOOD
#3
1964

No Scale

86-167

WE SELL WATER SYSTEMS WITH SERVICE

WEHLING WELL WORKS, INC.

GROUND WATER PROFESSIONALS FOR 3 GENERATIONS — SINCE 1902
ILLINOIS & INDIANA LICENSED WATER WELL CONTRACTORS & PUMP INSTALLERS
CERTIFIED BY THE NATIONAL WATER WELL ASSOCIATION

312 946-2244
EAST INDIANA AVE.
P.O. BOX 488
BEECHER, IL 60401
SO. SUB. PHONE
312 754-4240
2301 EAST LIBERTY ST.
AURORA, IL 60504
312 851-6294
Res. Phones
W.E. WEHLING
312 946-2192
R.H. WEHLING
312 946-2464

RESIDENTIAL
AGRICULTURAL
COMMERCIAL
MUNICIPAL
INDUSTRIAL

MEMBERS:
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SHALLOW WELLS
WATER SYSTEMS
DEEP WELLS
TURBINE PUMPS
ROCK DRILLING
PUMP REPAIRS
CUSTOM DRILLING
WELL SERVICES
TEST PUMP EQUIP.
CAISSONS
SUBMERSIBLE PUMPS
TEST WELLS
EQUIPMENT RENTALS
WELL SUPPLIES

Village of Glenwood
13 S. Rebecca Street
Glenwood, Illinois 60425

Re: Removing pumping equipment from Well #3 and abandonment of same.

Gentlemen:

We take pleasure in submitting the following quotation to furnish labor, well service equipment and material to remove existing vertical turbine pumping equipment from Well #3 including salvage for same and plugging of said well per the requirements of the Illinois Department of Mines and Minerals and file well plugging affadavit required with the State of Illinois.

The following procedure will be followed: Mobilize well service equipment, pull the Johnston vertical turbine pump consisting of a 300 HP motor, steel fab discharge head, 730' of 10" x 3½" x 2-3/16" column, tube and shaft, 11 stage 12CC bowl assembly, tail pipe, air line, etc. from the well and remove from the site.

Fill the drilled hole and shot hole with chlorinated washed pea gravel to 1145'. run 2-7/8" O.D. upset tubing and cement from 1145' to 1095' which is plugging the bottom St. Peter sandstone with a 25' neat cement plug and 25' below the St. Peter sandstone. Fill the 15¼" open hole with washed pea gravel from that point to 697'. Again run tubing and install a 50' neat cement plug to 647'. This is 25' below and 25' above the bottom of the 16" well casing which is cemented in to 672'. Then fill the 16" casing from that point with washed chlorinated pea gravel or bentonite and slurry to 20' below the ground surface and fill the top 20' with concrete. Demobilize the equipment and move out. All of the above work shall be performed for the total Lump Sum price of $19896.00

The Lump Sum prices are on the assumption that the pump is intact and does not part during the pulling operation. The above price does not include fishing for same. The Lump Sum price is based on the following rates and any additional work or fishing for the pumping equipment shall be done at these rates - on the basis of an 8 hour shift.

2 Men & equipment - - - - - $ 113.00 per hour
3 Men & equipment - - - - - $ 152.00 per hour
4 Men & equipment - - - - - $ 190.00 per hour
Hydrocrane and operator - - $ 62.00 per hour
5 days to start job.
30 days to complete job after notice to proceed.

Very truly yours,
WEHLING WELL WORKS, INC.
Richard H. Wehling Jr.
Richard H. Wehling, Vice Pres.

RHW:bk

WE SERVICE WATER SYSTEMS WE SELL

SPECIAL PROVISIONS
VILLAGE OF GLENWOOD

WELL PLUGGING - WELL 3 SITE

The contractor shall furnish labor, well service equipment and material to remove the existing vertical turbine pumping equipment at Well No. 3 site, including salvage for same and plugging of said well per the requirements of the State of Illinois, Department of Public Health and file a well plugging affidavit with that department.

The work shall be performed by a State of Illinois Licensed Water Well contractor. The contractor shall submit a list of similar projects completed, with his bid.

Existing Equipment

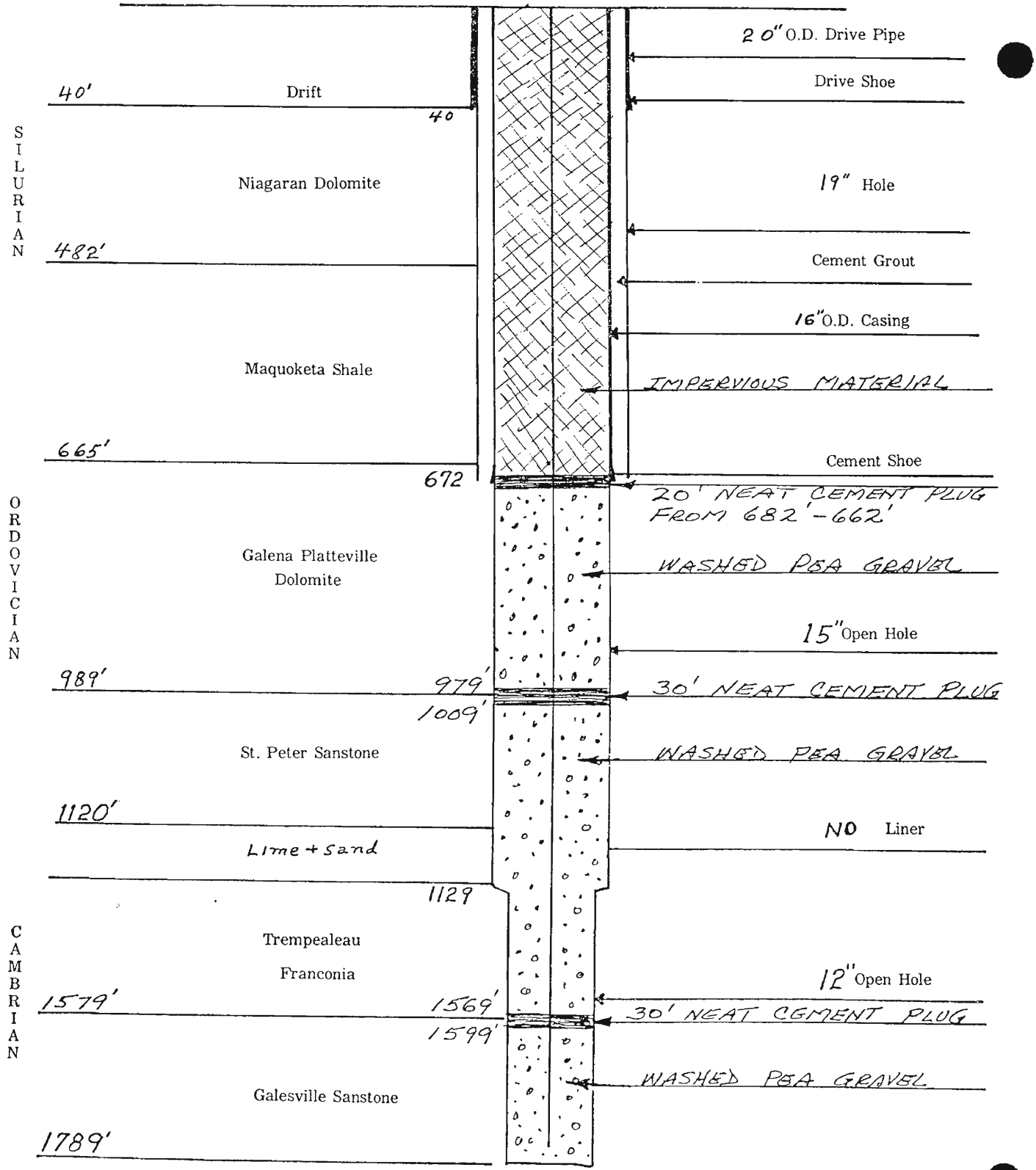
The existing pumping equipment consists of a vertical oil lubricated Johnston pump set at 730 feet on 10" x 3½" x 2'-3/16" oil lube column, tube and shaft assembly in 20' lengths. There is a 300 HP motor with an 11 stage 12 CC cast iron bowl assembly, tail pipe, air line, etc.

Procedure to be Followed

The contractor shall mobilize well service equipment, rig-up and pull existing pump equipment for salvage. The price of salvage shall be included in the bid.

The bottom 12" hole shall be filled from 1789 feet to 1599 feet with chlorinated, washed pea gravel. Cement tubing shall be run. The contractor shall place a 30 foot neat cement plug to 1569 feet, which is 10' above the top of the Galesville Sandstone formation. The contractor shall allow for required setting time, then fill the hole with chlorinated washed pea gravel from this point to 1009 feet. The contractor shall run tubing and place 30 feet of neat cement plug to 979 feet which is 10' above the top of the St. Peter Sandstone. The contractor shall allow for required setting time and then fill the 15" open hole with chlorinated washed pea gravel to 685 feet which is 10 feet below the cemented-in 16" casing. The contractor shall run tubing and place a 20' neat cement plug into the casing to 662 feet. The 16" casing should be filled to the surface with bentonite, clay slurry or an acceptable impervious material. The contractor shall leave the concrete base in place and fill to the top of said base.

The contractor shall be required to contact the State Inspector for this area before proceeding, then process and file the well plugging affidavit with the Illinois State Department of Public Health upon completion.



PLUG + ABANDON
1989

GLENWOOD
#3
1964

No Scale

SPECIAL PROVISIONS
* * * * * * * * * *

GENERAL REQUIREMENTS:

These specifications are to cover the removal and disposition of the existing well pump No.3 including associated electrical starting equipment, and the furnishing of a vertical hollow shaft motor driven well turbine pump rated at 800 gallons per minute, 250 horsepower, including electrical starting equipment, service drop revisions, etc.

OPERATING CONDITIONS:

The new pump shall be capable of pumping 800 GPM at a pumping level of 650 feet with a setting of 700 feet.

MOTOR, AND PUMP HEAD:

The electric motor shall be a hollow shaft 250 Hp open drip-proof squirrel cage motor, Class B insulation 40° degree C. temperature rise. It shall be wound for 480 volt, 60 cycle, 3 phase A.C. service. The thrust bearing shall be of ample size to carry all the weight of the rotating part plus the hydraulic thrust of the impellers and have an ample factor of safety.

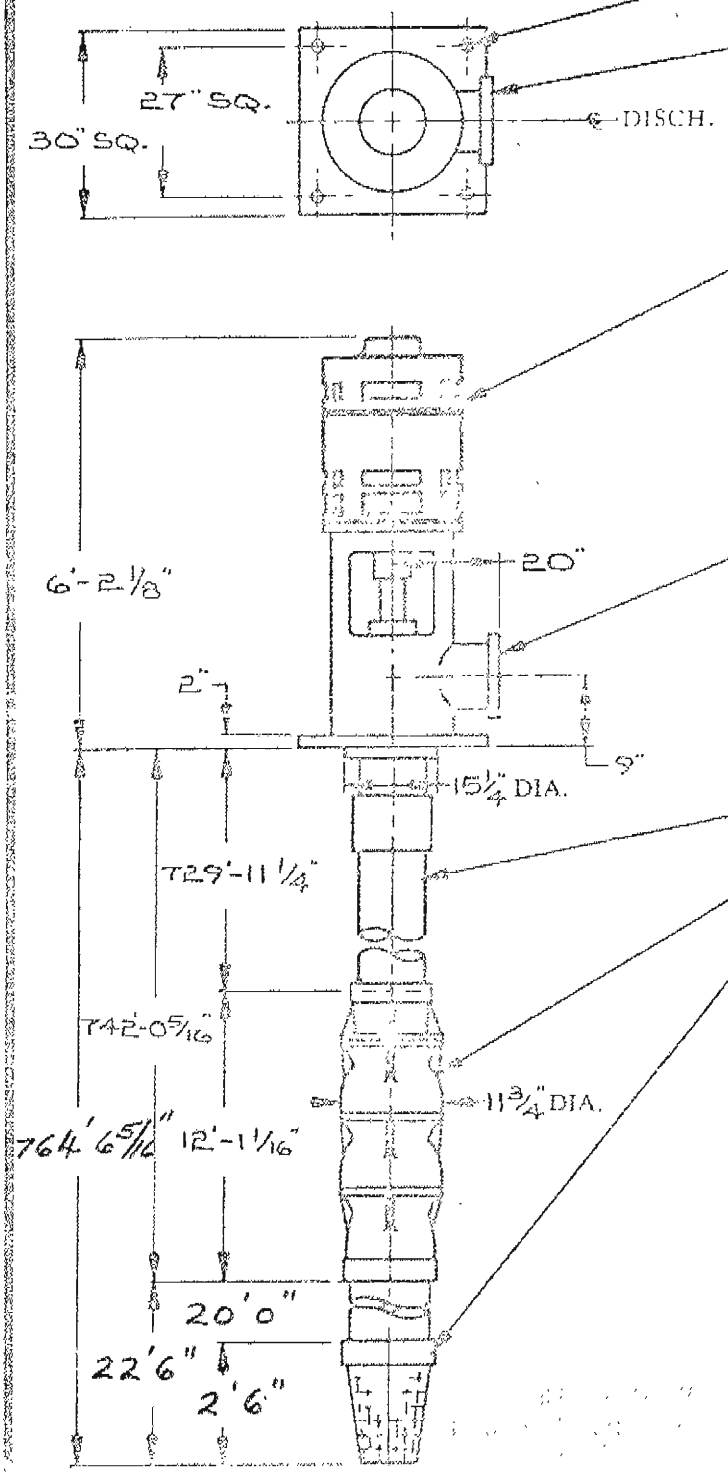
This factor shall be based on an average life expectancy of five years operation 24 hours a day. The bearing shall also be designed for any upthrust that may occur during the starting cycle. The thrust bearing shall have a rating of not less than 24,000 pounds and shall be a spherical roller thrust bearing. The oil bath system for the bearing shall be designed for water cooling. The motor shall have a full load operating speed of not less than 1750 RPM. No backspin ratchet will be required. The cooling system for the oil bath shall be designed to return the cooling water from the heat exchanger to the well. Discharge head assembly shall be 8" surface type of fabricated steel with a 8" ASA 150# discharge flange. The discharge head shall be two piece headshaft and coupling and be suitable for deeper setting at a later date. A base plate shall be welded to the well casing and a seal shall be installed between this plate and the pump base to conform to all State of Illinois Code requirements.

The motor shall be provided with space heaters for outside operation.

DISCHARGE COLUMN ASSEMBLY:

The total length of the discharge column shall be 700 feet. The column pipe shall be 8" diameter with 0.5" wall

JOHNSTON VERTICAL TURBINE PUMP



ALL BRZ. BOWL CONST, THRUST BAL COMP QUAD RING SAND CONST, 4 STGS. SUPERSTON 17-4 PH S.S. BOWL SHAFT, 410 S.S. BOWL WEAR RINGS, 316 S.S. LOCK COLLETS, INVERTED SAND COLLAR UNDER COMB. BRG. COLMONOY SLEEVE ON COMB. BRG.

GENERAL ELECTRIC
VERTICAL HOLLOW SHAFT MOTOR
HP—300 PHASE—3 CYCLE—60
VOLTAGE—WOUND 480 RPM—1800
ENCLOSURE—WEATHER PROTECTED
110 V. SPACE HEATERS, 63000 LA. WATER COOLED THRUST BRG. AND 175% EXTRA THRUST

TYPE "A" DISCHARGE HEAD - 24 1/2 x 8
2 PC. HEADSHAFT W/ THREADED CPLG.

CONDITIONS
U.S. GALLONS PER MINUTE - 1000
TOTAL DYNAMIC HEAD IN FT.— 830
LIQUID— WATER
SPEC. GRAV. 1.0 @ °F TEMP

COLUMN ASSEMBLY—10" x 3 1/2" x 2 3/16"
SCH. 60 COL. 235'4 1/6 S.S. LINESHAFT, 16 304 S.S. COUPLINGS, 20' COLUMN LENGTHS
BOWL ASSEMBLY— 16 STAGE 12 CC

SUCTION PIPE & CONE STRAINER—10"
BRZ. STRAINER

CUSTOMER VILLAGE OF GLENWOOD
PO # REF # WELL # 3
DEALER WEHLING WELL WORKS
PO # CONTRACT T1-14T
JOHNSTON SERIAL NO. GD 4543
JOHNSTON QUOTATION NO. CHI-T1-269

NOTE: DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED

THIS PRINT CERTIFIED

JOHNSTON PUMP CO.
GLENDORA, CALIFORNIA

H-3106-A

R.B. 10-19-71

Well 4 Information

Robinson ENGINEERING 75
Municipal Expertise. Community Commitment.

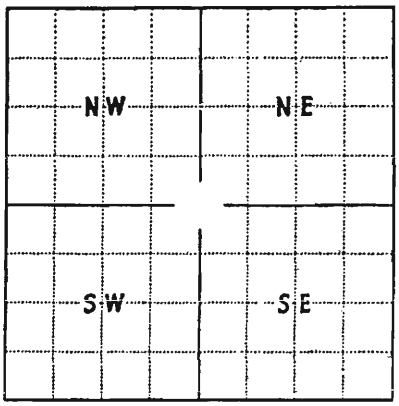
Form OG-8 (66772—10M—7-75)

STATE OF ILLINOIS
County of Will } ss.

WATER WELL PLUGGING AFFIDAVIT

_____ and

Raymond Hibner, being first duly sworn, do depose and say the following is a true and correct statement of the details of the plugging of a certain well drilled for water and located as follows:



Locate well accurately on plat of section
(Scale one inch—2,000 ft.)

Location in section 210'E 360'N SWc SE NE NW
Section 9 Township 35 Range 14
County Cook
Well name and number Well #4 (Northern Ill. Gas Co.)
Year drilled 1959
Reason for plugging Lake Michigan water
Total depth 222' Formation rock
How was depth determined? As reported _____
As measured x
Diameter of well at land surface 12" inches
Was well clear of obstructions to bottom before plugging? yes
Depth of obstruction _____. Nature of obstruction _____

Drilling permit No. and date, if known _____
Permit issued to _____
Kind of drilling tools used _____ Date plugging completed October 7, 1987
Property owner Village of Glenwood Address Glenwood, Ill.
Drilling contractor Wehling Well Works, Inc., Address P.O. Box 488, Beecher, Ill.

DETAILS OF PLUGGING

Filled with	Washed pea gravel (Cement or other Materials)	From	222	To	50 feet
Kind of plug	Neat Cement	From	50	To	surface feet
Filled with		From		To	feet
Kind of plug		From		To	feet
Filled with		From		To	feet
Kind of plug		From		To	feet

CASING RECORD

IN WELL Diameter (In.)	From (Ft.)	To (Ft.)	PULLED OUT From (Ft.)	To (Ft.)	REMARKS

_____
(Signature of person, firm or corporation having custody or control of well.)

Per _____

Address _____

Raymond L Hibner
(Signature and title of party supervising plugging of well.)

Address RR 1 Elwood Ill 60421

Subscribed and sworn to before me this 28th day of January A.D. 19 88.

My commission expires _____.

OFFICIAL SEAL
BETTY KROHN
NOTARY PUBLIC STATE OF ILLINOIS
MY COMMISSION EXP. JUNE 21, 1991

Betty Krohn
Notary Public

DEPARTMENT OF
REGISTRATION AND EDUCATION
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DIRECTOR, SPRINGFIELD
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AND CONSERVATION
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GEOLOGY . . . . LAURENCE L. SLOSS
SOUTHERN ILLINOIS UNIVERSITY . . .
PRESIDENT DELYTE W. MORRIS
UNIVERSITY OF ILLINOIS . . . . . .
DEAN WILLIAM L. EVERITT

Illinois State Water Survey

WATER RESOURCES BUILDING 605 E. SPRINGFIELD, CHAMPAIN • MAIL: BOX 232, URBANA, ILLINOIS 61801 • AREA CODE 217 PHONE 333-5470

WILLIAM C. ACKERMANN, CHIEF

October 13, 1967

PARTIAL CHEMICAL ANALYSIS

Sample of water collected September 29, 1967 from Well No. 4 owned by the Village of Glenwood, Illinois in Cook County. Location of well: 1000'S and 2200'E of the NW corner of Section 9, T35N, R14E. Depth of well: 222 feet.

LABORATORY NO. 173150

		ppm.	epm.			ppm.	epm.
Iron(total)	Fe	1.9		Fluoride	F	0.3	
Manganese	Mn	.00		Chloride	Cl	44.	1.24
				Nitrate	NO_3	0.4	.01
				Alkalinity	(as $CaCO_3$)	304.	6.08
Turbidity		5		Hardness	(as $CaCO_3$)	552.	11.04
Color		0					
Odor		0					
Temp.(reported)		53°F		Total Dissolved Minerals		736.	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

ILLINOIS STATE WATER SURVEY

Laurel N. Hanley
Chemist

LNH/bb

6 - 134

March 19, 1970

Glenwood Illinois

Mr. Carl L. Sebelius, D.D.S., Chief
Division of Dental Health
Department of Public Health
Springfield, Illinois

Dear Sir:

RE: Water Fluoridation
of Glenwood

In our capacity of Village Engineer for the Village of Glenwood, we have been requested to reply to your letter received March 2nd referring to fluoridation of water.

After having obtained Permit No.61-1969 (copy attached) to provide necessary equipment for the shallow wells in Glenwood (No's. 1, 2 and 4) which did not meet minimum fluoride content, the Village embarked upon installation of a new 1,000 gpm deep well, well pump and iron removal plant, the well showing a content of fluoride sufficient to meet requirements (copy of analysis attached). Since the new deep well in conjunction with the existing deep well number 3 are to constitute the supply system for all periods for some time to come, shallow wells 1, 2 and 4 are to be used only in extreme emergency, the Village felt installation of fluoride equipment to be unnecessary. At present well no.3 (with iron removal plant) provides the entire supply except during extreme emergency. In any event, well no.3, presently supplies approximately 90% of the annual use.

It is anticipated the iron removal plant number 2 at the new well site will be completed within the next five months. It is also anticipated that future water supply requirements will be from deep well source with similar fluoride content.

STATE OF ILLINOIS
DEPARTMENT OF
REGISTRATION AND EDUCATION
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DIRECTOR, SPRINGFIELD
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SOUTHERN ILLINOIS UNIVERSITY - - -
PRESIDENT DELYTE W. MORRIS
UNIVERSITY OF ILLINOIS - - - - -
DEAN WILLIAM L. EVERITT

Illinois State Water Survey

WATER RESOURCES BUILDING • MAIL: BOX 232, URBANA, ILLINOIS 61801 • AREA CODE 217
605 E. SPRINGFIELD, CHAMPAIGN PHONE 333-2210

WILLIAM C. ACKERMANN, CHIEF

October 13, 1967

Mr. Louis Komor
Water Superintendent
Glenwood, Illinois

Dear Mr. Komor:

We are enclosing copies of the partial analyses made on samples of water collected September 29, 1967 from the four wells owned by the Village of Glenwood.

The sample from Well No. 1 is shown by the analysis to contain less iron but a higher sulfate content (calculated value not shown on the analysis), alkalinity, hardness, and total mineral content than a previous sample from this well (Lab. No. 167074)

The sample from Well No. 2 is shown by the analysis to contain less iron but a higher chloride content, sulfate content (not shown), hardness, and total mineral content than a previous sample from Well No. 2 (Lab. No. 167076)

With the exception of the iron content which is somewhat less in the sample from Well No. 3, the analyses show this sample to be generally similar in mineral composition to a sample previously analyzed from Well No. 3 (Lab. No. 167077)

The sample from Well No. 4 is shown by the analysis to be generally similar in mineral constituents to a previous sample from Well No. 4 (Lab. No. 167[illegible]) ... it does, however, show that this sample contains a little more ... mineral content than the previous sample ...

... WATER SURVEY

LMH:
Enc.
cc:

Culligan

CULLIGAN WATER CONDITIONING COMPANY 17028 S. OAK PARK AVENUE TINLEY PARK, ILLINOIS
KEllogg 2-4313

September 6, 1967

67-154

Mr. Louis Komer
Water Superintendent
Glenwood Municipal Building
Rose and Rebecca Streets
Glenwood, Illinois, 60425,

Dear Mr. Komer:

Enclosed are copies of the alanyses of the raw water supply from Wells # 3 & 4 which I submitted to Culligan, Inc., Northbrook, Illinois, for examination.

You will note that well #3 indicates 1.2 parts per million of flourides and well #4 indicates .4 parts per million.

Well #4 is apparently lower in flourides content than your minimum standards.

It is a pleasure to be of help to you and please feel free to call on the writer at any time he can be of service.

Sincerely yours,

CULLIGAN WATER CONDITIONING

Arthur S. Leonard
Vice-President

ASL:me
encls.

FAMOUS FOR . . .
Culligan Soft Water Service, Culligan Iron Removal Service,
Culligan Automatic Water Softeners and Salt Delivery Service.

Well 5 Information

Robinson ENGINEERING 75

Municipal Expertise. Community Commitment.

ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Silurian	44	
Maquoketa	473	
Galena	680	
St Peter	1012	
Ironton	1607	
Eau Claire	1769	
Total Depth		1785

Driller's Log filed

Sample set # 56581 (0' - 1785') Received: October 9, 1969

Permit Date: **Permit #:**

COMPANY Wehling Well Works Inc.

FARM Glenwood Village

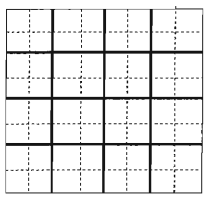
DATE DRILLED January 1, 1969 **NO.** 5

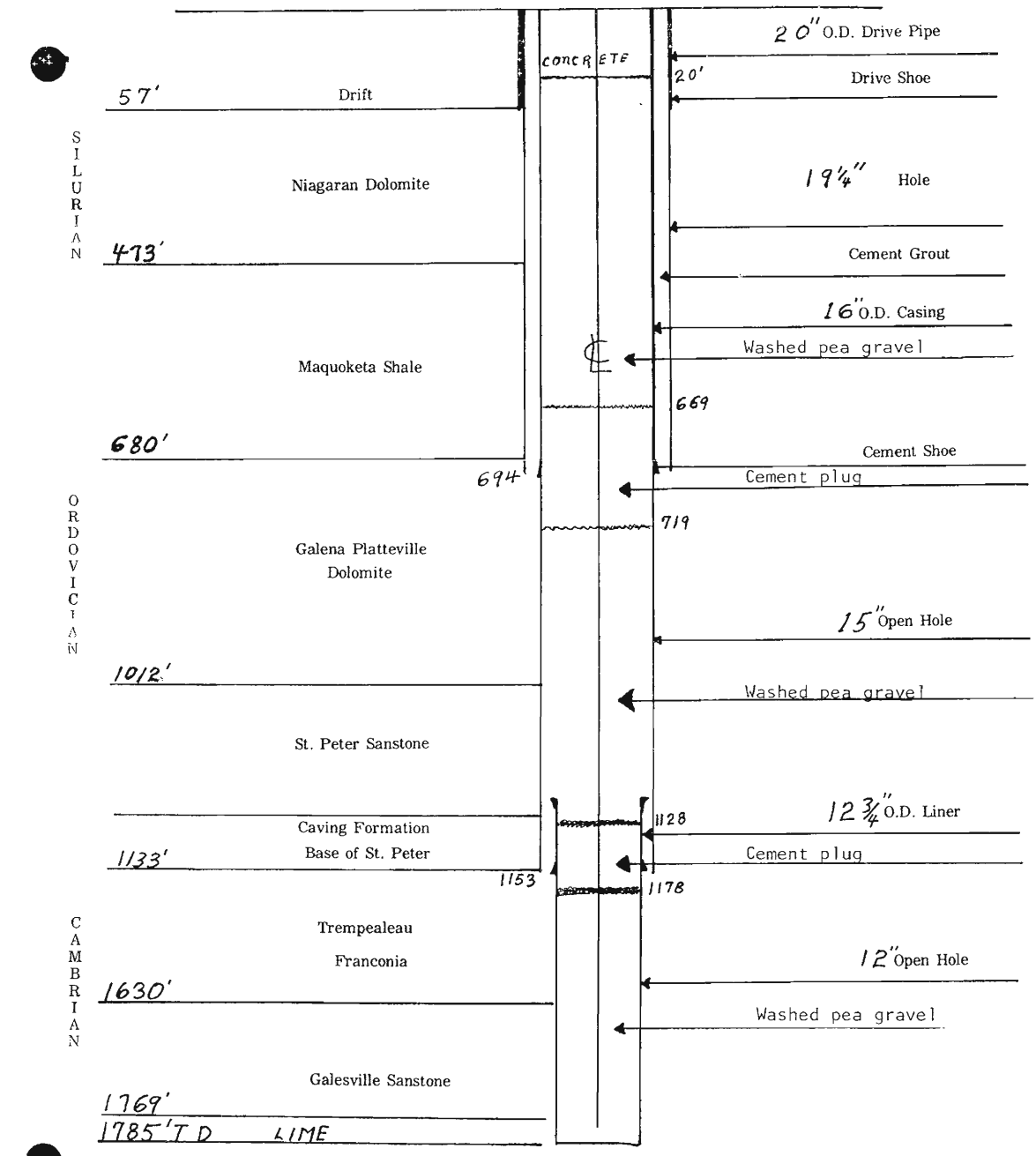
ELEVATION 627GL **COUNTY NO.** 00958

LOCATION 943'N line, 405'E line of NE

LATITUDE 41.540003 **LONGITUDE** -87.598567

COUNTY Cook **API** 120310095800 10 - 35N - 14E





VILLAGE OF GLENWOOD
#5
1969

No Scale

6 - 134

March 19, 1970

Glenwood Mail

Mr. Carl L. Sebelius, D.D.S.,Chief
Division of Dental Health
Department of Public Health
Springfield, Illinois

Dear Sir:

RE: Water Fluoridation
of Glenwood

In our capacity of Village Engineer for the Village of Glenwood, we have been requested to reply to your letter received March 2nd referring to fluoridation of water.

After having obtained Permit No.61-1969 (copy attached) to provide necessary equipment for the shallow wells in Glenwood (No's. 1, 2 and 4) which did not meet minimum fluoride content, the Village embarked upon installation of a new 1,000 gpm deep well, well pump and iron removal plant, the well showing a content of fluoride sufficient to meet requirements (copy of analysis attached). Since the new deep well in conjunction with the existing deep well number 3 are to constitute the supply system for all periods for some time to come, shallow wells 1, 2 and 4 are to be used only in extreme emergency, the Village felt installation of fluoride equipment to be unnecessary. At present well no.3 (with iron removal plant) provides the entire supply except during extreme emergency. In any event, well no.3, presently supplies approximately 90% of the annual use.

It is anticipated the iron removal plant number 2 at the new well site will be completed within the next five months. It is also anticipated that future water supply requirements will be from deep well source with similar fluoride content.

AURORA PUMP
A UNIT OF GENERAL SIGNAL

NO. OF PRINTS	
	FOR APPROVAL
7	FINAL

SALES OFFICE: Aurora Pump - Chicago PO # CH7-973-9A

FACTORY ORDER NUMBER: 8D7-08239

JOB: Pump Station #2 - Well #5

SERVICE:

ENGINEER:

CONTRACTOR:

SOLD TO: Metropolitan Pump Co. PO # 6386 Muns

REFERENCE: Glenwood

PUMP

Two NUMBER OF UNITS | 5 x 6 x 15 SIZE | 411 MODEL | 4 POWER SERIES | PUMP ONLY ☐

1000 GPM | 139' TDH | 1750 RPM | ROTATION: RH ☒ LH ☐

BASE:
- ☐ STEEL DRIP RIM
- ☒ STEEL
- ☐ FABRICATED STEEL
- ☐ CAST IRON RING TYPE

CONSTRUCTION:
- ☐ STANDARD FITTED
- ☑ BRZ FIT
  - CASE C.I.
  - IMP. BRZ.
  - SHAFT STL.
  - SLEEVE BRZ.
  - CASE RING BRZ.
  - IMP. RING BRZ.
  - CH. RING ____
  - SPACER ____

COUPLING:
- ☒ STANDARD
- ☐ SPACER
- ☒ GUARD

STUFFING BOX:
- ☒ MECHANICAL SEAL
  - ☒ STANDARD
  - ☐ ____
- ☐ PACKING
- ☐ LANTERN RING

CONNECTIONS
- ☐ THREADED
- ☒ FLANGE
  - ☒ 125 #
  - ☐ 150 #
  - ☐ 250 #
  - ☐ 300 #

LUBRICATION
- ☒ GREASE
- ☐ OIL

MOTOR

50 HP | 3 PHASE | 60 HERTZ | 230/460 VOLTS | 1750 RPM | 326T FRAME

BY: ☒ AURORA ☐ OTHERS | ☒ ODP ☐ TEFC ☐ XPROOF | ☐ VERTICAL ☒ HORIZONTAL ☐ PART WINDING | F/C MANUFACTURER

NOTE: MOTOR NOT MOUNTED AT FACTORY ON VERTICAL UNITS.

SPECIAL REQUIREMENTS

CERTIFIED PRINT: SECTION. 410 PAGE: 252 CURVE NUMBER: 2PC-17329

SPECIAL. MAINTENANCE

BY: J.J. PF DATE: 6/30/87 OFFICE: AURORA

NOTE: EXCEPTIONS

THIS ORDER WILL NOT BE PROCESSED FOR MANUFACTURING UNTIL APPROVAL IS RECEIVED PRINTS ARE NOT TO SCALE AND ARE CERTIFIED CORRECT ONLY FOR THIS ORDER. ALL ORDERS SUBJECT TO ACCEPTANCE AT AURORA PUMP, NORTH AURORA, ILLINOIS.

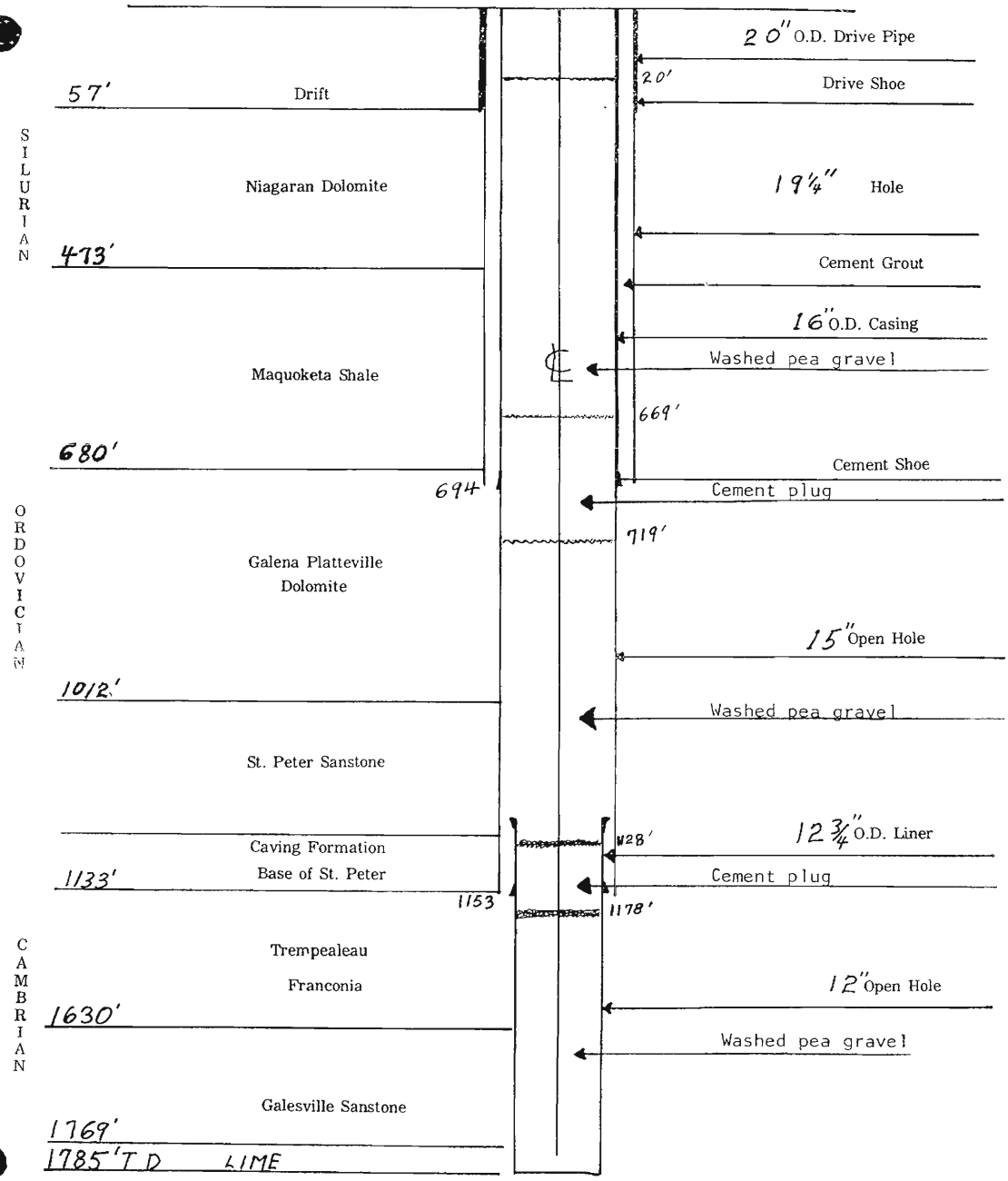
THIS ORDER CAN BE RELEASED FOR MANUFACTURING AS SHOWN. ☒ AUTHORITY ASSOC. CO.

RELEASE FOR MANUFACTURING PER ATTACHED CHANGE ORDER: ☐ OFFICE By:

Date: 8/21/87 DATE

40130 (2-84)

86.167



VILLAGE OF GLENWOOD
#5
1969

No Scale

86-167

WE SELL WATER SYSTEMS WITH SERVICE

WEHLING WELL WORKS, INC.

GROUND WATER PROFESSIONALS FOR 3 GENERATIONS — SINCE 1902
ILLINOIS & INDIANA LICENSED WATER WELL CONTRACTORS & PUMP INSTALLERS
CERTIFIED BY THE NATIONAL WATER WELL ASSOCIATION

April 24, 1987

312 946-2244
EAST INDIANA AVE.
P.O. BOX 488
BEECHER, IL 60401
SO. SUB. PHONE
312 754-4240
2301 EAST LIBERTY ST.
AURORA, IL 60504
312 851-6294
Res. Phones
W.E. WEHLING
312 946-2192
R.H. WEHLING
312 946-2464

RESIDENTIAL
AGRICULTURAL
COMMERCIAL
MUNICIPAL
INDUSTRIAL

MEMBERS:
IWWA
NWWA
GWI
AWWA
IWDCA
GWC

SHALLOW WELLS
WATER SYSTEMS
DEEP WELLS
TURBINE PUMPS
ROCK DRILLING
PUMP REPAIRS
CUSTOM DRILLING
WELL SERVICES
TEST PUMP EQUIP.
CAISSONS
SUBMERSIBLE PUMPS
TEST WELLS
EQUIPMENT RENTALS
WELL SUPPLIES

Village of Glenwood
13 S. Rebecca Street
Glenwood, Illinois 60425

Re: Removing pumping equipment from Well #5 and abandonment of same.

Gentlemen:

We take pleasure in submitting the following quotation to furnish labor, well service equipment and material to remove existing vertical turbine pumping equipment from Well #5 including salvage for same and plugging of said well per the requirements of the Illinois Department of Mines and Minerals and file well plugging affadavit required with the State of Illinois.

The following procedure will be followed: Mobilize well service equipment, pull the Johnston vertical turbine pump consisting of a 300 HP motor, steel fab discharge head, 720' of 10" x 3½" x 2-3/16" column, tube and shaft, 9 stage 14 AC bowl assembly, tail pipe, air line, etc., from the well and remove from site for salvage.

Fill the drilled hole and the shot hole with washed chlorinated pea gravel to 1178' run cement tubing and cement from 1178' to 1128' which seperates the St. Peter sandstone from the Galesville sandstone with a 50' neat cement plug. Fill the 15" open hole with washed chlorinated pea gravel from that point to 719'. Again run tubing and cement a 50' plug with neat cement to 669'. This is 25' below and 25' above the bottom of the 16" well casing which is cemented in to 694'. Fill the 16" casing from that point with washed pea gravel or bentonite and clean slurry to 20' below the ground surface and fill the top 20' with concrete. Demobilize the equipment and move out. All of the above work shall be performed for the total Lump Sum price of $19896.00.

The lump sum prices are on the assumption that the pump is intact and does not part during the pulling operation. The above price does not include fishing for same. The Lump Sum price is based on the following rates and any additional work or fishing for the pumping equipment shall be done at these rates - on the basis of an 8 hour shift.

2 Men & equipment - - - - - $113.00 per hour
3 Men & equipment - - - - - $152.00 per hour
4 Men & equipment - - - - - $190.00 per hour
Hydrocrane and operator - - $62.00 per hour.

Signed: Richard H. Wehling Jr.

Dated: 4/27/87

WE SERVICE WATER SYSTEMS WE SELL

[redacted]

Miscellaneous Well Information

Robinson ENGINEERING 75

Municipal Expertise. Community Commitment.


Well 1 (1961 - 455')
Well 2 (1962 - 427')
Well (1946 - 150')
Well 3 (1964 - 1789')
Well Skyline Pool (1963 - 355')
Glenwood
Glenwood, IL, USA
Well 5 (1969 - 1785')
Well Glenwoodie (1927 - 269')
Well Catholic Cemeteries (201
Well Glenwoodie (1987 - 475')
Well Glenwoodie (1927 - 225')
Elder Rd
183rd St
Aberdeen St
Carpenter St
Illinois Ave
Arizona Ave
N Strieff Ln
W Strieff Ln
Kenneth Ct
W Holly Ct
Aquinas Dr
Park Dr
S Glenwood-Thornton Rd
Merrill St
Maple Dr
N Cedar Ln
Coach Rd
May St
Queens Rd
Kings Rd
Glenwood Rd
Chicago Heights
S Young St
E Mulberry Dr
E Rose St
Clark St
192nd St
Holbrook Rd
Patricia Dr
S Woodlawn St
S Pearl St
W 194th St
195th St
Grace Dr
E Craig Dr
N Halsted St
196th St
Glenwood Rd
Alice St
Millard Ln
Vollmer Rd
Avonelle Dr
Chicago Rd
S Halsted St
State St
© 2012 Google
Google earth
miles
km
1
2

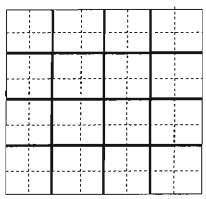
ILLINOIS STATE GEOLOGICAL SURVEY

	Top	Bottom
Total Depth		355

Sample set # 44767 (0' - 355') Received: October 1, 1963

Permit Date: Permit #:

COMPANY Wehling Well Works
FARM Skyline Pool Assoc
DATE DRILLED October 1, 1963 **NO.** 1
ELEVATION 0 **COUNTY NO.** 32850
LOCATION 60'S 700'E NW/c NW
LATITUDE 41.542249 **LONGITUDE** -87.633541
COUNTY Cook **API** 120313285000 9 - 35N - 14E



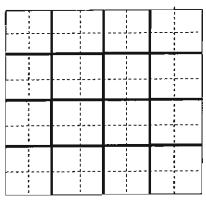
ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Silurian	20	
Total Depth		269

Driller's Log filed
Survey Sample Study filed
Company Sample Study filed
Sample set # 624 (0' - 269') Received: January 5, 1927

Permit Date: **Permit #:**

COMPANY Gray Well Drilling
FARM Glenwoodie Co Club
DATE DRILLED **NO.** 1
ELEVATION 629GL **COUNTY NO.** 01822
LOCATION 2600'N line, 1550'W line of section
LATITUDE 41.535435 **LONGITUDE** -87.610798
COUNTY Cook **API** 120310182200 10 - 35N - 14E



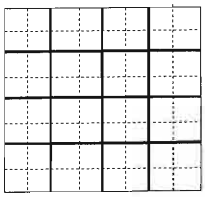
ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Silurian	47	
Total Depth		150
Driller's Log filed		

well 4
222'

Permit Date: Permit #:

COMPANY Wehling Edwin C
FARM Glenwood Village
DATE DRILLED January 1, 1946 NO.
ELEVATION 623GL COUNTY NO. 01789
LOCATION NW SW
LATITUDE 41.548183 LONGITUDE -87.614197
COUNTY Cook API 120310178900 3 - 35N - 14E



ILLINOIS STATE GEOLOGICAL SURVEY

Irrigation Well	Top	Bottom
clay and gravel	0	47
clay and boulders	47	50
broken lime	50	190
lime - grey & white	190	400
lime	400	465
shale	465	475
Silurian	50	
Maquoketa	465	
Total Depth		**475**

Casing: 12" BLACK STEEL from 1' to 54'

Size hole below casing: 11.87"

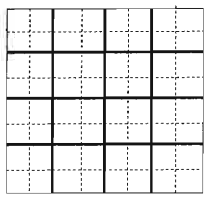
Static level 14' below casing top which is 1' above GL
Pumping level 133' when pumping at 400 gpm for 16 hours

Sample set # 66731 (0' - 475') Received: November 20, 1989

Location source: Location from permit

Permit Date: May 14, 1987 **Permit #:** 131711

COMPANY Wehling, Wendell E.
FARM Glenwoodie Golf & Country Club
DATE DRILLED June 18, 1987 **NO.**
ELEVATION 629GL **COUNTY NO.** 28080
LOCATION 35'S line, 150'E line of SW NE SW
LATITUDE 41.531778 **LONGITUDE** -87.609706
COUNTY Cook **API** 120312808000 **10 - 35N - 14E**



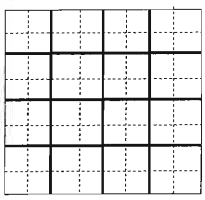
ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Silurian	25	
Total Depth		225

Driller's Log filed
Company Sample Study filed
Sample set # 625 (0' - 220') Received: January 5, 1927

Permit Date: **Permit #:**

COMPANY Gray Well Drilling
FARM Glenwoodie Co Club
DATE DRILLED **NO.** 2
ELEVATION 630GL **COUNTY NO.** 01823
LOCATION 100'S line, 2600'W line of section
LATITUDE 41.528336 **LONGITUDE** -87.606837
COUNTY Cook **API** 120310182300 10 - 35N - 14E



ILLINOIS STATE GEOLOGICAL SURVEY

Water Well for Commercial Operation	Top	Bottom
black dirt	0	2
clay	2	45
rock	45	270
shale at	270	270
Total Depth		**270**

Casing: 6" GALV. STEEL from -2' to 45'

Grout: CEMENT from 0 to 45.

Size hole below casing: 6"

Water from rock at 270' to '.

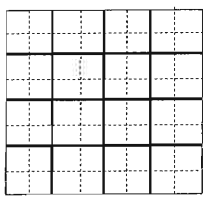
Permanent pump installed at 160' on September 13, 2011, with a capacity of 10 gpm

Address of well: 19500 Cottage Grove Ave.
Glenwood, IL

Location source: Location from permit

Permit Date: August 29, 2011 **Permit #:** 031-016

COMPANY Wehling, Richard W.
FARM Catholic Cemeteries
DATE DRILLED August 29, 2011 **NO.** 2
ELEVATION **COUNTY NO.** 36018
LOCATION SE NE SE
LATITUDE 41.532643 **LONGITUDE** -87.598257
COUNTY Cook **API** 120313601800 10 - 35N - 14E



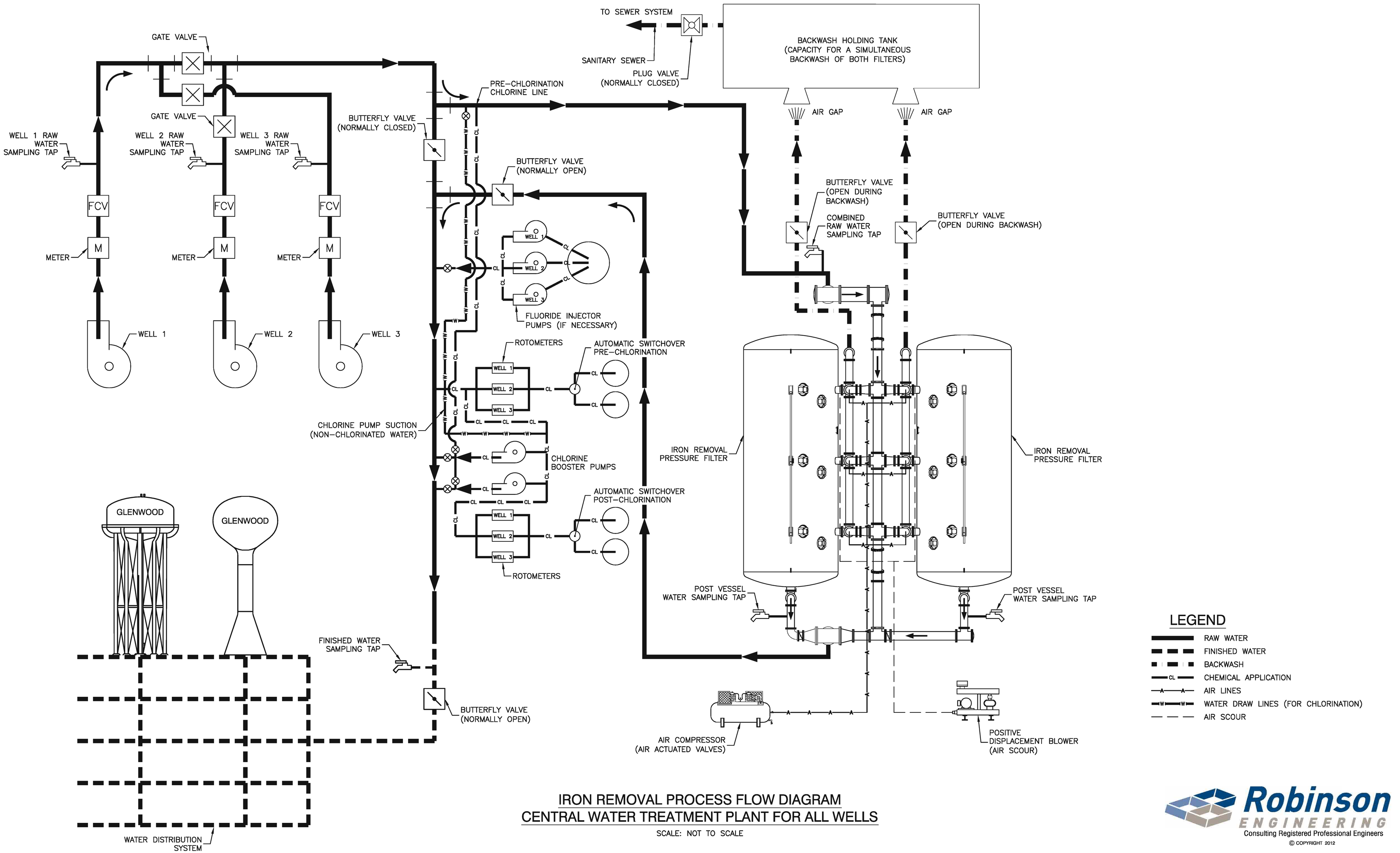
Appendix 3

Typical Iron Removal System Schematic for Central Water Treatment Plant

Typical Iron Removal System Schematic Single Well

Robinson ENGINEERING 75

Municipal Expertise. Community Commitment.



IRON REMOVAL PROCESS FLOW DIAGRAM
CENTRAL WATER TREATMENT PLANT FOR ALL WELLS

SCALE: NOT TO SCALE

Robinson ENGINEERING
Consulting Registered Professional Engineers

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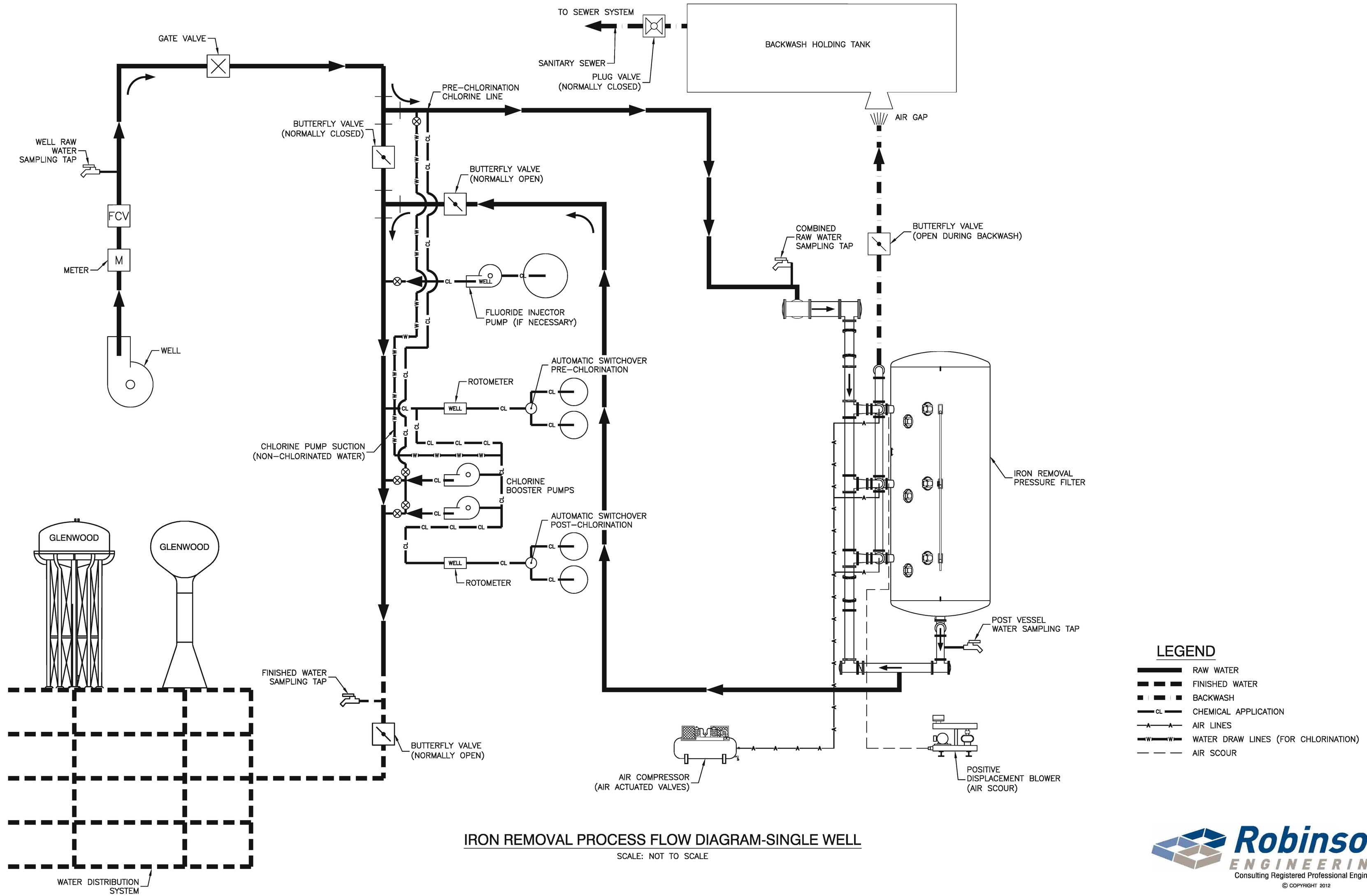

IRON REMOVAL PROCESS FLOW DIAGRAM-SINGLE WELL

SCALE: NOT TO SCALE

Robinson ENGINEERING
Consulting Registered Professional Engineers
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Appendix 4

Cost Estimates

Robinson ENGINEERING 75

Municipal Expertise. Community Commitment.

Village of Glenwood

Well Cost Estimates

Alternative 1A - Three 800 gpm deep wells at Komer Booster Station Site

Number of Wells-KOMER	3	
Estimated Flow	800	gpm each
Total Capacity	2,400	gpm

Building Width	20	ft
Building Length	30	ft
Size of Building	600	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Well Drilling	Each	3	$ 680,000	$ 2,040,000	
Installation of Well, Piping, Test Pumping and Disinfection	Each	3	$ 150,000	$ 450,000	
Land Acquisition	L. Sum	1	$ 30,000	$ 30,000	
Building	Sq Ft	600	$ 425	$ 255,000	
Electrical	Sq Ft	600	$ 55	$ 33,000	
HVAC	Sq Ft	600	$ 50	$ 30,000	
Plumbing	Sq Ft	600	$ 35	$ 21,000	
Emergency Generator	L.Sum	1	$ 200,000	$ 200,000	
Chemical Equipment	L.Sum	1	$ 20,000	$ 20,000	
Supervisory Control and Data Acquisition	L.Sum	1	$ 150,000	$ 150,000	
	Subtotal			$ 3,229,000	
	Design & Construction Observation			$ 807,250	
	Contingency		20%	$ 645,800	$ 4,690,000
	Total			$ 4,682,050	

Village of Glenwood

Well Cost Estimates

Alternative 1B - Two 800 gpm deep wells at Komer Booster Station Site and One 800 gpm deep well at Brookwood Point Booster Station Site

Number of Wells-KOMER	2	
Estimated Flow	800	gpm each
Total Capacity	1,600	gpm

Building Width	15	ft
Building Length	25	ft
Size of Building	375	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Well Drilling	Each	2	$ 680,000	$ 1,360,000	
Installation of Well, Piping, Test Pumping and Disinfection	Each	2	$ 150,000	$ 300,000	
Land Acquisition	L. Sum	1	$ 30,000	$ 30,000	
Building	Sq Ft	375	$ 425	$ 159,375	
Electrical	Sq Ft	375	$ 55	$ 20,625	
HVAC	Sq Ft	375	$ 50	$ 18,750	
Plumbing	Sq Ft	375	$ 35	$ 13,125	
Emergency Generator	L.Sum	1	$ 150,000	$ 150,000	
Chemical Equipment	L.Sum	1	$ 20,000	$ 20,000	
Supervisory Control and Data Acquisition	L.Sum	1	$ 75,000	$ 75,000	
	Subtotal			$ 2,146,875	
	Design & Construction Observation			$ 536,719	
	Contingency		20%	$ 429,375	$ 3,120,000
	Total			$ 3,112,969	

Number of Wells-BROOKWOOD	1	
Estimated Flow	800	gpm each
Total Capacity	800	gpm

Building Width	10	ft
Building Length	20	ft
Size of Building	200	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Well Drilling	Each	1	$ 680,000	$ 680,000	
Installation of Well, Piping, Test Pumping and Disinfection	Each	1	$ 150,000	$ 150,000	
Land Acquisition	L. Sum	1	$ 100,000	$ 100,000	
Building	Sq Ft	200	$ 425	$ 85,000	
Electrical	Sq Ft	200	$ 55	$ 11,000	
HVAC	Sq Ft	200	$ 50	$ 10,000	
Plumbing	Sq Ft	200	$ 35	$ 7,000	
Emergency Generator	L.Sum	1	$ 75,000	$ 75,000	
Chemical Equipment	L.Sum	1	$ 20,000	$ 20,000	
Supervisory Control and Data Acquisition	L.Sum	1	$ 75,000	$ 75,000	
	Subtotal			$ 1,213,000	
	Design & Construction Observation			$ 303,250	
	Contingency		20%	$ 242,600	$ 1,760,000
	Total			$ 1,758,850	

Village of Glenwood
Well Cost Estimates

Alternative 1C - One 800 gpm deep well at Komer Booster Station Site, One 800 gpm deep well at Brookwood Point Booster Station Site, One 800 gpm deep well in Business Park

Number of Wells-KOMER	1	
Estimated Flow	800	gpm each
Total Capacity	1,600	gpm

Building Width	10	ft
Building Length	20	ft
Size of Building	200	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Well Drilling	Each	1	$ 680,000	$ 680,000	
Installation of Well, Piping, Test Pumping and Disinfection	Each	1	$ 150,000	$ 150,000	
Land Acquisition	L. Sum	1	$ 30,000	$ 30,000	
Building	Sq Ft	200	$ 425	$ 85,000	
Electrical	Sq Ft	200	$ 55	$ 11,000	
HVAC	Sq Ft	200	$ 50	$ 10,000	
Plumbing	Sq Ft	200	$ 35	$ 7,000	
Emergency Generator	L.Sum	1	$ 75,000	$ 75,000	
Chemical Equipment	L.Sum	1	$ 20,000	$ 20,000	
Supervisory Control and Data Acquisition	L.Sum	1	$ 50,000	$ 50,000	
	Subtotal			$ 1,118,000	
	Design & Construction Observation			$ 279,500	
	Contingency		20%	$ 223,600	$ 1,630,000
	Total			$ 1,621,100	

Number of Wells-BROOKWOOD	1	
Estimated Flow	800	gpm each
Total Capacity	800	gpm

Building Width	10	ft
Building Length	20	ft
Size of Building	200	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Well Drilling	Each	1	$ 680,000	$ 680,000	
Installation of Well, Piping, Test Pumping and Disinfection	Each	1	$ 150,000	$ 150,000	
Land Acquisition	L. Sum	1	$ 100,000	$ 100,000	
Building	Sq Ft	200	$ 425	$ 85,000	
Electrical	Sq Ft	200	$ 55	$ 11,000	
HVAC	Sq Ft	200	$ 50	$ 10,000	
Plumbing	Sq Ft	200	$ 35	$ 7,000	
Emergency Generator	L.Sum	1	$ 75,000	$ 75,000	
Chemical Equipment	L.Sum	1	$ 20,000	$ 20,000	
Supervisory Control and Data Acquisition	L.Sum	1	$ 50,000	$ 50,000	
	Subtotal			$ 1,188,000	
	Design & Construction Observation			$ 297,000	
	Contingency		20%	$ 237,600	$ 1,730,000
	Total			$ 1,722,600	

Village of Glenwood

Well Cost Estimates

Alternative 1C - One 800 gpm deep well at Komer Booster Station Site, One 800 gpm deep well at Brookwood Point Booster Station Site, One 800 gpm deep well in Business Park

Number of Wells-BUSINESS PARK	1	
Estimated Flow	800	gpm each
Total Capacity	800	gpm

Building Width	10	ft
Building Length	20	ft
Size of Building	200	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Well Drilling	Each	1	$ 680,000	$ 680,000	
Installation of Well, Piping, Test Pumping and Disinfection	Each	1	$ 150,000	$ 150,000	
Land Acquisition	L. Sum	1	$ 100,000	$ 100,000	
Building	Sq Ft	200	$ 425	$ 85,000	
Electrical	Sq Ft	200	$ 55	$ 11,000	
HVAC	Sq Ft	200	$ 50	$ 10,000	
Plumbing	Sq Ft	200	$ 35	$ 7,000	
Emergency Generator	L.Sum	1	$ 75,000	$ 75,000	
Chemical Equipment	L.Sum	1	$ 20,000	$ 20,000	
Supervisory Control and Data Acquisition	L.Sum	1	$ 50,000	$ 50,000	
	Subtotal			$ 1,188,000	
	Design & Construction Observation			$ 297,000	
	Contingency		20%	$ 237,600	$ 1,730,000
	Total			$ 1,722,600	

Village of Glenwood

Water Treatment Scenarios Cost Estimates

Alternative 2A - Water Treatment- 1600 gpm iron removal filters with softening at Komer Booster Station Site

Total Design Capacity	1,600	gpm

Iron Removal

Number of Vessels	2	
Tank Diameter	12	ft
Tank Length	32	ft

Building Width	36	ft
Building Length	48	ft
Size of Building	1,728	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Iron Removal Vessels (equipment only)	Each	2	$ 280,000	$ 560,000	
Installation of Vessel, Piping and Appurtenances	L Sum	1	$ 150,000	$ 150,000	
Land Acquisition	L Sum	1	$ 30,000	$ 30,000	
Backwash Basement	L Sum	1	$ 150,000	$ 150,000	
Backwash Sewer	L Sum	1	$ 50,000	$ 50,000	
Building	Sq Ft	1,728	$ 425	$ 734,400	
Electrical	Sq Ft	1,728	$ 55	$ 95,040	
HVAC	Sq Ft	1,728	$ 50	$ 86,400	
Plumbing	Sq Ft	1,728	$ 35	$ 60,480	
Chemical Equipment	L Sum	1	$ 20,000	$ 20,000	
Site Work	L Sum	1	$ 250,000	$ 250,000	
Supervisory Control and Data Acquisition	L Sum	1	$ 50,000	$ 50,000	
	Subtotal			$ 2,236,320	
	Design & Construction Observation			$ 559,080	
	Contingency		20%	$ 447,264	$ 3,250,000
	Total			$ 3,242,664	

Softening

Number of Vessels	3	
Diameter of Vessels	12	ft

Building Addition Width	18	ft
Building Addition Length	48	ft
Size of Building Addition	864	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Ion Exchange Vessels (equipment only)	Each	3	$ 140,000	$ 420,000	
Land Acquisition	L Sum	1	$ 30,000	$ 30,000	
Installation of Vessels and Piping	L Sum	1	$ 105,000	$ 105,000	
Building	Sq Ft	864	$ 425	$ 367,200	
Electrical	Sq Ft	864	$ 55	$ 47,520	
HVAC	Sq Ft	864	$ 50	$ 43,200	
Plumbing	Sq Ft	864	$ 35	$ 30,240	
	Subtotal			$ 1,043,160	
	Design & Construction Observation			$ 260,790	
	Contingency		20%	$ 208,632	$ 1,520,000
	Total			$ 1,512,582	

Village of Glenwood

Water Treatment Scenarios Cost Estimates

Alternative 2B - Water Treatment- 800 gpm iron removal filters with softening at each Booster Station Site

Total Design Capacity-KOMER	800	gpm

Iron Removal-KOMER

Number of Vessels	1	
Tank Diameter	12	ft
Tank Length	32	ft

Building Width	18	ft
Building Length	48	ft
Size of Building	864	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Iron Removal Vessels (equipment only)	Each	1	$ 280,000	$ 280,000	
Installation of Vessel, Piping and Appurtenances	L Sum	1	$ 150,000	$ 150,000	
Land Acquisition	L Sum	1	$ 30,000	$ 30,000	
Backwash Basement	L Sum	1	$ 150,000	$ 150,000	
Backwash Sewer	L Sum	1	$ 50,000	$ 50,000	
Building	Sq Ft	864	$ 425	$ 367,200	
Electrical	Sq Ft	864	$ 55	$ 47,520	
HVAC	Sq Ft	864	$ 50	$ 43,200	
Plumbing	Sq Ft	864	$ 35	$ 30,240	
Chemical Equipment	L Sum	1	$ 20,000	$ 20,000	
Site Work	L Sum	1	$ 175,000	$ 175,000	
Supervisory Control and Data Acquisition	L Sum	1	$ 50,000	$ 50,000	
	Subtotal			$ 1,393,160	
	Design & Construction Observation			$ 348,290	
	Contingency		20%	$ 278,632	$ 2,030,000
	Total			$ 2,020,082	

Softening-KOMER

Number of Vessels	1	
Diameter of Vessels	12	ft

Building Addition Width	18	ft
Building Addition Length	18	ft
Size of Building Addition	324	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Ion Exchange Vessels (equipment only)	Each	1	$ 180,000	$ 180,000	
Land Acquisition	L Sum	1	$ 30,000	$ 30,000	
Installation of Vessels and Piping	L Sum	1	$ 105,000	$ 105,000	
Building	Sq Ft	324	$ 425	$ 137,700	
Electrical	Sq Ft	324	$ 55	$ 17,820	
HVAC	Sq Ft	324	$ 50	$ 16,200	
Plumbing	Sq Ft	324	$ 35	$ 11,340	
	Subtotal			$ 498,060	
	Design & Construction Observation			$ 124,515	
	Contingency		20%	$ 99,612	$ 730,000
	Total			$ 722,187	

Total Design Capacity-BROOKWOOD	800	gpm

Iron Removal-BROOKWOOD

Number of Vessels	1	
Tank Diameter	12	ft
Tank Length	32	ft

Building Width	18	ft
Building Length	48	ft
Size of Building	864	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Iron Removal Vessels (equipment only)	Each	1	$ 280,000	$ 280,000	
Installation of Vessel, Piping and Appurtenances	L Sum	1	$ 150,000	$ 150,000	
Land Acquisition	L Sum	1	$ 100,000	$ 100,000	
Backwash Basement	L Sum	1	$ 150,000	$ 150,000	
Backwash Sewer	L Sum	1	$ 50,000	$ 50,000	
Building	Sq Ft	864	$ 425	$ 367,200	
Electrical	Sq Ft	864	$ 55	$ 47,520	
HVAC	Sq Ft	864	$ 50	$ 43,200	
Plumbing	Sq Ft	864	$ 35	$ 30,240	
Chemical Equipment	L Sum	1	$ 20,000	$ 20,000	
Site Work	L Sum	1	$ 175,000	$ 175,000	
Supervisory Control and Data Acquisition	L Sum	1	$ 50,000	$ 50,000	
	Subtotal			$ 1,463,160	
	Design & Construction Observation			$ 365,790	
	Contingency		20%	$ 292,632	$ 2,130,000
	Total			$ 2,121,582	

Softening-BROOKWOOD

Number of Vessels	1	
Diameter of Vessels	12	ft

Building Addition Width	18	ft
Building Addition Length	18	ft
Size of Building Addition	324	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Ion Exchange Vessels (equipment only)	Each	1	$ 180,000	$ 180,000	
Land Acquisition	L Sum	1	$ 100,000	$ 100,000	
Installation of Vessels and Piping	L Sum	1	$ 105,000	$ 105,000	
Building	Sq Ft	324	$ 425	$ 137,700	
Electrical	Sq Ft	324	$ 55	$ 17,820	
HVAC	Sq Ft	324	$ 50	$ 16,200	
Plumbing	Sq Ft	324	$ 35	$ 11,340	
	Subtotal			$ 568,060	
	Design & Construction Observation			$ 142,015	
	Contingency		20%	$ 113,612	$ 830,000
	Total			$ 823,687	

Village of Glenwood

Water Treatment Scenarios Cost Estimates

Alternative 2C - Water Treatment- 800 gpm iron removal filters with softening at each Booster Station Site and in the Business Park

Total Design Capacity-KOMER	800	gpm

Iron Removal-KOMER

Number of Vessels	1	
Tank Diameter	12	ft
Tank Length	32	ft

Building Width	18	ft
Building Length	48	ft
Size of Building	864	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Iron Removal Vessels (equipment only)	Each	1	$ 280,000	$ 280,000	
Installation of Vessel, Piping and Appurtenances	L Sum	1	$ 150,000	$ 150,000	
Land Acquisition	L Sum	1	$ 30,000	$ 30,000	
Backwash Basement	L Sum	1	$ 150,000	$ 150,000	
Backwash Sewer	L Sum	1	$ 50,000	$ 50,000	
Building	Sq Ft	864	$ 425	$ 367,200	
Electrical	Sq Ft	864	$ 55	$ 47,520	
HVAC	Sq Ft	864	$ 50	$ 43,200	
Plumbing	Sq Ft	864	$ 35	$ 30,240	
Chemical Equipment	L Sum	1	$ 20,000	$ 20,000	
Site Work	L Sum	1	$ 175,000	$ 175,000	
Supervisory Control and Data Acquisition	L Sum	1	$ 50,000	$ 50,000	
	Subtotal			$ 1,393,160	
	Design & Construction Observation			$ 348,290	
	Contingency		20%	$ 278,632	$ 2,030,000
	Total			$ 2,020,082	

Softening-KOMER

Number of Vessels	1	
Diameter of Vessels	12	ft

Building Addition Width	18	ft
Building Addition Length	18	ft
Size of Building Addition	324	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Ion Exchange Vessels (equipment only)	Each	1	$ 180,000	$ 180,000	
Land Acquisition	L Sum	1	$ 30,000	$ 30,000	
Installation of Vessels and Piping	L Sum	1	$ 105,000	$ 105,000	
Building	Sq Ft	324	$ 425	$ 137,700	
Electrical	Sq Ft	324	$ 55	$ 17,820	
HVAC	Sq Ft	324	$ 50	$ 16,200	
Plumbing	Sq Ft	324	$ 35	$ 11,340	
	Subtotal			$ 498,060	
	Design & Construction Observation			$ 124,515	
	Contingency		20%	$ 99,612	$ 730,000
	Total			$ 722,187	

Total Design Capacity-BROOKWOOD	800	gpm

Iron Removal-BROOKWOOD

Number of Vessels	1	
Tank Diameter	12	ft
Tank Length	32	ft

Building Width	18	ft
Building Length	48	ft
Size of Building	864	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Iron Removal Vessels (equipment only)	Each	1	$ 280,000	$ 280,000	
Installation of Vessel, Piping and Appurtenances	L Sum	1	$ 150,000	$ 150,000	
Land Acquisition	L Sum	1	$ 100,000	$ 100,000	
Backwash Basement	L Sum	1	$ 150,000	$ 150,000	
Backwash Sewer	L Sum	1	$ 50,000	$ 50,000	
Building	Sq Ft	864	$ 425	$ 367,200	
Electrical	Sq Ft	864	$ 55	$ 47,520	
HVAC	Sq Ft	864	$ 50	$ 43,200	
Plumbing	Sq Ft	864	$ 35	$ 30,240	
Chemical Equipment	L Sum	1	$ 20,000	$ 20,000	
Site Work	L Sum	1	$ 175,000	$ 175,000	
Supervisory Control and Data Acquisition	L Sum	1	$ 50,000	$ 50,000	
	Subtotal			$ 1,463,160	
	Design & Construction Observation			$ 365,790	
	Contingency		20%	$ 292,632	$ 2,130,000
	Total			$ 2,121,582	

Softening-BROOKWOOD

Number of Vessels	1	
Diameter of Vessels	12	ft

Building Addition Width	18	ft
Building Addition Length	18	ft
Size of Building Addition	324	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Ion Exchange Vessels (equipment only)	Each	1	$ 180,000	$ 180,000	
Land Acquisition	L Sum	1	$ 100,000	$ 100,000	
Installation of Vessels and Piping	L Sum	1	$ 105,000	$ 105,000	
Building	Sq Ft	324	$ 425	$ 137,700	
Electrical	Sq Ft	324	$ 55	$ 17,820	
HVAC	Sq Ft	324	$ 50	$ 16,200	
Plumbing	Sq Ft	324	$ 35	$ 11,340	
	Subtotal			$ 568,060	
	Design & Construction Observation			$ 142,015	
	Contingency		20%	$ 113,612	$ 830,000
	Total			$ 823,687	

Total Design Capacity-BUSINESS PARK	800	gpm

Iron Removal-BUSINESS PARK

Number of Vessels	1	
Tank Diameter	12	ft
Tank Length	32	ft

Building Width	18	ft
Building Length	48	ft
Size of Building	864	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Iron Removal Vessels (equipment only)	Each	1	$ 280,000	$ 280,000	
Installation of Vessel, Piping and Appurtenances	L Sum	1	$ 150,000	$ 150,000	
Land Acquisition	L Sum	1	$ 100,000	$ 100,000	
Backwash Basement	L Sum	1	$ 150,000	$ 150,000	
Backwash Sewer	L Sum	1	$ 50,000	$ 50,000	
Building	Sq Ft	864	$ 425	$ 367,200	
Electrical	Sq Ft	864	$ 55	$ 47,520	
HVAC	Sq Ft	864	$ 50	$ 43,200	
Plumbing	Sq Ft	864	$ 35	$ 30,240	
Chemical Equipment	L Sum	1	$ 20,000	$ 20,000	
Site Work	L Sum	1	$ 250,000	$ 250,000	
Supervisory Control and Data Acquisition	L Sum	1	$ 150,000	$ 150,000	
	Subtotal			$ 1,638,160	
	Design & Construction Observation			$ 409,540	
	Contingency		20%	$ 327,632	$ 2,380,000
	Total			$ 2,375,332	

Softening-BUSINESS PARK

Number of Vessels	1	
Diameter of Vessels	12	ft

Building Addition Width	18	ft
Building Addition Length	18	ft
Size of Building Addition	324	Sq Ft

Item	Unit	Quantity	Unit Price	Total	
Ion Exchange Vessels (equipment only)	Each	1	$ 180,000	$ 180,000	
Land Acquisition	L Sum	1	$ 100,000	$ 100,000	
Installation of Vessels and Piping	L Sum	1	$ 105,000	$ 105,000	
Building	Sq Ft	324	$ 425	$ 137,700	
Electrical	Sq Ft	324	$ 55	$ 17,820	
HVAC	Sq Ft	324	$ 50	$ 16,200	
Plumbing	Sq Ft	324	$ 35	$ 11,340	
	Subtotal			$ 568,060	
	Design & Construction Observation			$ 142,015	
	Contingency		20%	$ 113,612	$ 830,000
	Total			$ 823,687	

Village of Glenwood

Operation and Maintenance Cost Estimates

Flow Data		
Average Daily Flow (2011)	990,000	gallons/day
Billing Units per Year	361,350	1,000 gallons / year

Power Cost		
Electricity Rate	$0.08	Kw-hr

Well Treatment - Labor Costs for Staff		
Number of Employees	1	
Hourly Rate	$ 50	per hour
Daily Cost	$ 100	per day
Weekly Cost	$ 500	per week
Yearly Cost	$ 26,000	per year
Labor Cost Based Upon $/1,000 Gallons	$ 0.07	per 1,000 gallons

Well Treatment - MWRD Wastewater Disposal		
Sewage Production	20.0%	of total flow
Daily Sewage Flow	198,000	gallons per day
Weekly Sewage Flow	1,386,000	gallons per week
Yearly Sewage Flow	72,072,000	gallons per year
MWRD Sewage Rate	$ 230.29	per 1,000,000 gallons
MWRD Cost per Year	$ 16,597	per year
Glenwood's Cost per 1,000 Gallons for M	$ 0.05	per 1,000 gallons

Well Treatment - Operational Cost		
Well Service Pumping Cost	$ 0.28	/1,000 gallons
MWRD Wastewater Disposal	$ 0.05	/1,000 gallons
WTP operation	$ 0.50	/1,000 gallons
Labor Costs	$ 0.07	/1,000 gallons
Subtotal	$ 0.90	/1,000 gallons

Village of Glenwood

Cost Summary Sheet

Alternative	Wells	Water Treatment	Total Capital Costs	Annual debt repayment	2011 ADF	No. of annual 1000 gal units based on 2011 ADF	Capital Cost /1000 gallons based on 2011 ADF	O&M Cost /1000 gallons based on 2011 ADF	Total Cost/1000 gallons
1A	$4,690,000		$4,690,000	$376,337.73	0.99	361,350	$ 1.04	$ 0.90	$ 1.94
1B	$4,880,000		$4,880,000	$391,583.83	0.99	361,350	$ 1.08	$ 0.90	$ 1.98
1C	$5,090,000		$5,090,000	$408,434.77	0.99	361,350	$ 1.13	$ 0.90	$ 2.03
2A	$4,690,000	$4,770,000	$9,460,000	$759,094.87	0.99	361,350	$ 2.10	$ 0.90	$ 3.00
2B	$4,880,000	$5,720,000	$10,600,000	$850,571.42	0.99	361,350	$ 2.35	$ 0.90	$ 3.25
2C	$5,090,000	$8,930,000	$14,020,000	$1,125,001.07	0.99	361,350	$ 3.11	$ 0.90	$ 4.01

Interest Rate 5.0%
Terms 20

Alternative	Description
1A	Three 800 gpm deep wells at Komer Booster Station Site
1B	Two 800 gpm deep wells at Komer Booster Station Site and One 800 gpm deep well at Brookwood Point Booster Station Site
1C	One 800 gpm deep well at Komer Booster Station Site, One 800 gpm deep well at Brookwood Point Booster Station Site, One 800 gpm deep well in Business Park
2A	Alternative 1A plus 1600 gpm iron removal filters with softening at Komer Booster Station Site
2B	Alternative 1B plus 800 gpm iron removal filters with softening at each Booster Station Site
2C	Alternative 1C plus 800 gpm iron removal filters with softening at each Booster Station Site and in the Business Park