

Item #6:
Village President Rodriguez
Lake Michigan Allocation Update
(Written Testimony Electronic)

Lake Michigan Allocation Testimony Exhibits Available Upon Request

WRITTEN TESTIMONY OF MARIA RODRIGUEZ

My name is Maria Rodriguez, and I serve as the Village President of the Village of Long Grove. I have served in this position since May 2005, and I have previously served as Village Trustee and Village Clerk. I am here to provide testimony in support of the Application for Allocation Permit for Lake Michigan Water for the Village of Long Grove.

The Village is a municipality whose population at the time of the last census was 6,735, but whose current population is estimated at 8,400¹ – a nearly 25% growth during the past decade. Despite its relatively modest population, Long Grove includes approximately 18 square miles of area in southwest and central Lake County. Lake County is at the extreme northeastern portion of the State, bounded by the State of Wisconsin to the north and Lake Michigan to the east. Lake County is also immediately north of Cook County and is extensively served by the highway and public transit systems linking areas throughout the greater Chicago metropolitan area. Because of its superb location and extensive and accessible transportation systems, the Village, along with many other Lake County communities, has experienced substantial growth and continued development pressures. Due to this intensification of development, the continuing availability of a sufficient supply of ground water has become an increasing concern as the Village seeks to protect the health, safety, and welfare of its residents by making available a reliable source of quality potable water for consumption, sanitation, fire protection, and other purposes.

As the Village has tried to assess the many issues surrounding the securing of a long-term water supply for its residents and businesses, it has become increasingly clear

¹ This population estimate is based on CMAP figures as well as building permit and related information available to the Village from resident registrations.

that this is not a problem just for the Village, or even for communities in Lake County. Rather, this is a concern for a much broader region. In recognition of this, the Village has tried to look beyond its boundaries when evaluating water supply issues, and therefore has been working cooperatively with various other providers of water service in Lake County, including the County of Lake, the Village of Antioch, the Village of Fox Lake, the Village of Lake Villa, the Village of Lindenhurst, the Village of Wauconda, the Village of Lake Zurich, the Village of Volo, and the Village of Hawthorn Woods, as well as the Lake County Public Water District (the "Planning Group"). Through these cooperative efforts, the Village and the other members of the Planning Group have concluded that concerns about quality, adequacy, and reliability of water supply for water service would be alleviated if (a) Lake Michigan water were the water source for the various members' water systems, and (b) the members worked together to establish a joint system to provide Lake Michigan water to their respective jurisdictions.

In furtherance of the Planning Group's efforts, the Village and other Planning Group members have made application to the Illinois Department of Natural Resources for a Lake Michigan water allocation. Successful conclusion of this coordinated effort to obtain Lake Michigan water allocations is essential to the efforts of the Planning Group as a whole to establish a joint system to provide Lake Michigan water to the Planning Group members. The Village believes that it should be classified as a Category IA Applicant because its primary water needs are residential, commercial, or industrial, and because the long view makes clear that using Lake Michigan water is the most economical source of supply, both from a local and from a broader regional perspective. At the same time, the Village believes that its application would meet the criteria for a Category IIB Applicant, because a Lake Michigan water allocation will reduce the amount of water withdrawn from the deep Cambrian-Ordovician Aquifer.

Because of its considerable land area and relatively modest population, providing for a community-wide water system is a particular challenge for Long Grove. There are existing developments in the Village being served by subdivision-wide water systems where residents routinely seek assistance from the Village Board to address their need and desire for a more reliable water source via Lake Michigan. At the same time, there are areas with very low density development in the Village where reliance on wells is reasonable; *provided that* the overall demand on ground water sources within the broader area are controlled. For this reason, the Village recognizes that it will need to implement a variety of strategies in order to ensure that the public health and safety of the Village and its residents are protected from a water supply perspective.

To confirm that its residents did not want to pursue a "one size fits all" approach to water service, in April 2009 the Village Board placed a referendum on the ballot to ask the community about establishing a water system to serve *every property* in the community. Based on a study undertaken by ESI Consultants, Ltd., such a village-wide system would have cost the average home approximately \$6,900 annually for 30 years. Not unexpectedly, the majority of Village residents did not support a village-wide water system to serve every single property at so high a cost.

As a result, the Village has focused more on developing a water system that would cost-effectively serve areas with the most critical needs, which could be extended incrementally based on need. ESI's review of this phased delivery of water showed that the average cost per household in the anticipated first-phase of delivering Lake Michigan water through the Planning Group would be approximately \$45,000 per home (the "Phase I System"). This results in a net cost of about \$2,700 annually over 30 years,²

² This calculation is based on a loan interest rate of 5.5% with an average savings of \$384 annually from the elimination of private water softener services.

which is 0.5% of the average home price in the Village per year.³ This cost is not unmanageable for most Village residents, and this approach has received support from various subdivisions within the Village, as well as from the owners of non-residential properties in Long Grove. In fact, the Village Board received a request within the past two months from the 122-lot Heron's Landing subdivision to obtain Lake Michigan water for its residents.

The Village has already begun to implement steps to address these more critical community needs. The area in the southeastern portion of Long Grove (which includes the Village's historic downtown area) requires a reliable community water system for the long-term health and fire safety of the residents and businesses in the area. The support for this effort has been tremendous. In fact, four private property owners have bound themselves to pay \$3,200,000 as part of a special service area to finance the first leg of the Village's water system to serve a portion of that area.⁴ Although this new water system is being designed to be served by two deep wells, the special service area currently covers fewer than 50 acres, and its ability to expand to serve other areas in the southeast portion of the Village may be impaired if it must rely on ground water for its water supply.

Having considered the many facets and options for water service in the Village, the Village Board has recognized that seeking Lake Michigan water for Long Grove is necessary for the long-term benefit of the community. Accordingly, the Village Board unanimously passed Resolution No. 2009-R-43 in support of the efforts of the Planning Group to obtain Lake Michigan water allocations for each of its members and for the joint

³ See <http://www.househunt.com/sold-prices/Long%20Grove-IL-60047>, which shows an average sales price in the Village of nearly \$510,000 over the past three years, which is 212.5% of the average sales price in the Chicago metropolitan area. See http://www.trulia.com/real_estate/Chicago-Illinois/market-trends/.

⁴ A copy of Village Ordinance No. 2008-O-15 establishing this special service area is attached to this written testimony as Exhibit A.

project to develop a common source of supply for Lake Michigan water through the creation of a joint action water agency.

A. Statement of Problem – Local Perspective

The Village has studied carefully the challenges presented in providing a reliable and adequate source of potable water for the residents and businesses of Long Grove, now and in the future. Although much of this is dependent on technical scientific analyses, the basic public policy issue is "How can a governmental body best provide adequate, reliable, and cost-effective water service to the community for the long-term?"

Properties in Long Grove currently obtain their water from a variety of private sources that draw water from shallow wells for about 70% of their supply, with the remaining 30% being drawn from deep wells. Long Grove currently faces problems associated with its water supply. First, for the majority of users relying on shallow wells, the demand upon the aquifers is already intense and grows more severe with each passing year. As development continues, however, not only will demand on the shallow aquifers increase, but the impervious surfaces from development will diminish the aquifer's ability to recharge itself. Thus, the shallow wells are in a downward spiral in terms of their ability to sustain the demand for adequate and safe water supplies. And there is no way for the Village to halt that spiral: municipalities face constitutional limitations on restricting the use of private property (or, alternatively, face legal expenses and monetary damages for inverse condemnation claims), so there is neither the constitutional authority nor the financial resources to adopt a policy of "No more development."

Second, even where water is supplied from deep wells (which accounts for 30% of the Village's usage today and will be the primary source for new users in the future if a Lake Michigan allocation does not become available), the deep Cambrian-Ordovician

aquifer is being stressed by ongoing and increasing demand. As development extends farther from Chicago, the overall demand on the aquifer increases. The Village recognized a looming problem more than 10 years ago when, in its Comprehensive Plan, it observed that "a water shortage could result from the increased demand for water and the concurrent destruction of natural recharge locations" as development continues.

Although the Village has tried to pursue policies to protect recharge areas and maintain relatively low density development, the aquifers do not follow municipal boundaries, and Long Grove's efforts cannot address the broader pressures being placed on the deep and shallow aquifers available to Long Grove residents. Because local governments often evaluate their choices for water service independently, they often find that there is no other choice but to draw groundwater from the deep and shallow aquifers. Each time that individual municipalities decide that groundwater is the only choice, the threat becomes more severe that these aquifers – even deep ones – will not be able to sustain the long-term demands of those populations. And a water supply that is inadequate is *never* cost-effective.

Third, groundwater presents other challenges such as the need for increasingly extensive treatment due to the hardness and other attributes of the groundwater as well as the increasing regulatory standards. While the need to treat water is not limited to groundwater, the fact is that growing communities require multiple wells in order to utilize groundwater sources and provide sufficient reliability and redundancy in their water supply, which means that either there is a cost to transport the water to a common location for treatment or the cost of treatment must be replicated at each location. We recognize both the community need and demand for high-quality water and the need to meet regulatory requirements, and recognize that these forces will require us to make

financial commitments to improve our groundwater quality if Lake Michigan water is not allocated to Long Grove.

For Long Grove residents, the ground water quality presents several common problems. The degree of hardness in the water has been measured as among the highest in the Chicago metropolitan area, and this results in lime build-up in pipes, humidifiers, and water heaters. Similarly, high iron levels in the ground water are also quite common, resulting both in staining of fixtures and susceptibility to iron bacteria. Some areas in the Village also experience high levels of dissolved hydrogen sulfide, resulting in unpleasant odors and related annoyances.

As a result, the Village and other local governments face an increasingly dismal prospect for serving their communities with a reliable and adequate water supply from groundwater sources. While there is one of the largest fresh water bodies in the world at the eastern edge of our county, communities like Long Grove that are near but not adjacent to Lake Michigan cannot individually create a water system using Lake Michigan as a water source.

For this reason, the applications of the Village and the other Planning Group members create a unique opportunity because of the cooperative efforts involved. Anyone who has been involved in government recognizes the difficulties in reaching the type of consensus needed for cooperative action of this magnitude. And yet, the current opportunity will not only help the Planning Group members, it will benefit the broader regional interests by relieving some of the pressures on available groundwater sources, which in turn will improve the relative availability of groundwater for those communities that are simply too far from Lake Michigan to make it a viable water source.⁵

⁵ The Urban Land Institute has recognized the regional benefit of the Planning Group's activities as set forth in the January 6, 2010 letter to the IDNR, a copy of which is attached to this testimony as Exhibit B.

B. Outline of Alternatives

Recognizing that we face a serious long-term problem, the Village hired Applied Technologies as a consultant to provide a Lake Michigan water feasibility study and an amendment to update that study. Applied Technologies also prepared our Lake Michigan water allocation application, including a comparison of the cost effectiveness of Lake Michigan water and groundwater supply systems.

In reviewing these alternatives, Applied Technologies found that, if *all of* Long Grove received Lake Michigan water *exclusively* from the system being contemplated by the Planning Group, the cost-effectiveness of a ground water system and a Lake Michigan-supplied system were roughly equivalent. Presumably, because of the substantially lower per-lot cost for the Phase I System (\$2,700 annually for the Phase I System versus \$6,900 annually for serving the entire Village), the relative cost-effectiveness of providing Lake Michigan water improves dramatically. Even so, the strictly dollars comparison of Lake Michigan water and ground water sources does not reveal the full cost of water service, as such costs must be evaluated in terms of the public policy need to have a water supply that provides long-term reliability. From that perspective, only Lake Michigan water offers an adequate, reliable, long-term source of potable water, but Lake Michigan as a water source is beyond reach if the Village attempted to "go it alone."

In this regard, the Village of Long Grove is uniquely fortunate. It is located with Lake Michigan water sources from the Northwest Water Commission ("NWC") and the Central Lake County Joint Action Water Agency ("CLCJAWA") immediately adjacent to parts of its municipal boundaries. Thus, Long Grove will not have to "go it alone," either through participation in the Planning Group or by acquiring water for parts of the

community from NWC or CLCJAWA. Moreover, to the extent that Lake Michigan water can be acquired from NWC or CLCJAWA, the costs of delivering water to Long Grove could be significantly reduced, which would make the cost-effectiveness of Lake Michigan water versus ground water material and indisputable.

C. Outline of Solution

As a result, obtaining access to Lake Michigan water through a joint cooperative venture is the preferred solution for the Village of Long Grove to ensure a long-term, reliable supply of water for the residents of Long Grove. This solution is also preferred because it provides the greatest regional benefit.

Creation of a new water agency would enable the members of the Planning Group to marshal resources both to make Lake Michigan water accessible, but also to promote system-wide water conservation measures. Further, creation of the proposed new joint action water agency would enhance conservation of water in the aquifers for areas located farther from Lake Michigan that cannot reasonably access the Lake Michigan water supply. Creation of a new water agency that provides Lake Michigan water to the Planning Group members would also provide other mutual regional benefits, including opportunities for regional inter-connections and redundancy for the existing CLCJAWA and the NWC infrastructure. In fact, because of the Village's geographic location, it is uniquely positioned to act as a hub for the interconnection of all three of these intergovernmental water groups.

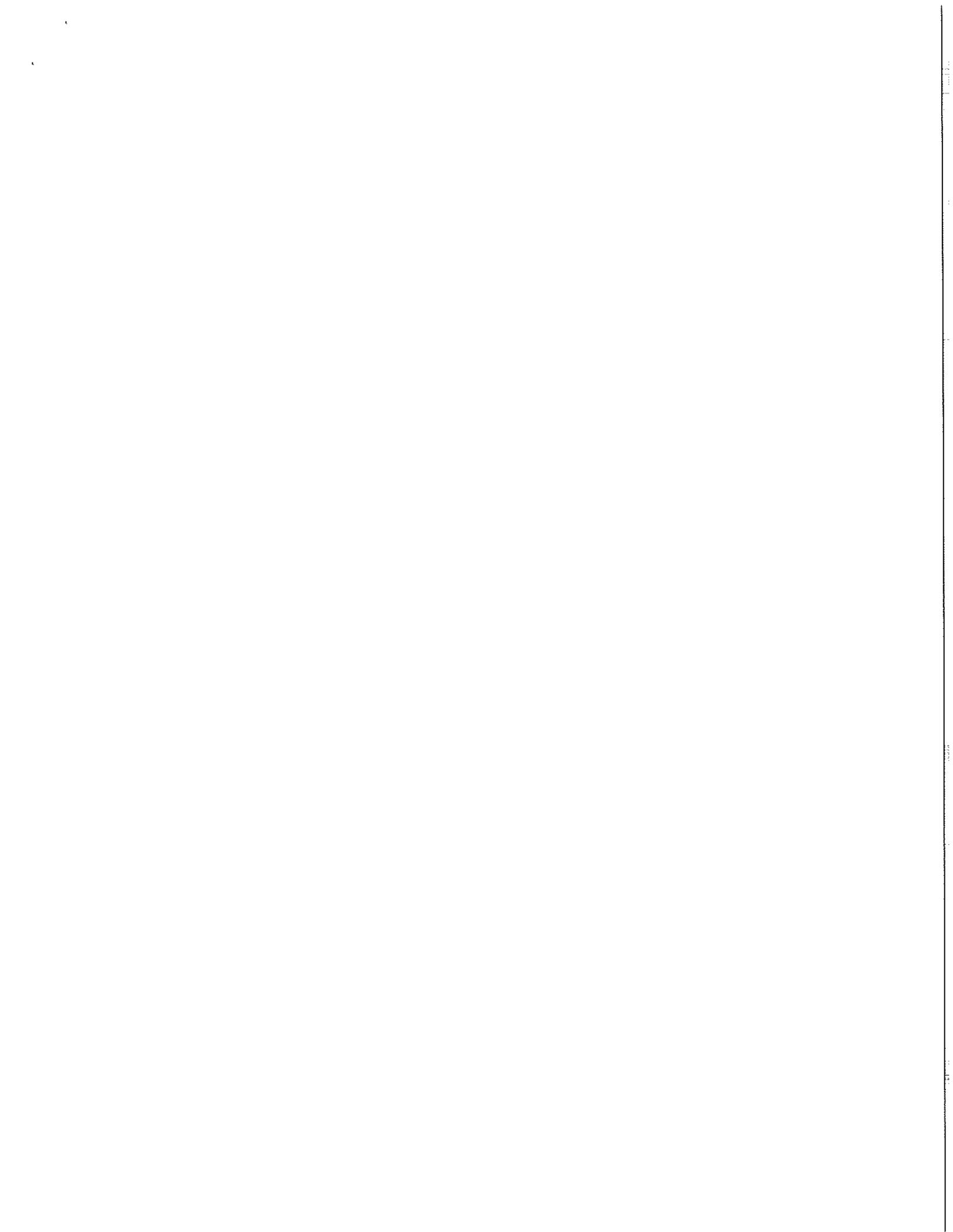
Based on the studies we have done to date, the Village recognizes that water is an essential and precious resource. For this reason, even though the Village has no community water system as yet, the Village has undertaken various conservation measures, including low-density land use regulations, regulations to establish conservancy areas for protecting and preserving ground water recharge areas, and the

adoption of modern building codes (including the 2009 International Building Code and the 2004 Illinois Plumbing Code), which require low-flow plumbing fixtures and hot water recirculation elements in new construction (see Exhibit C to this Testimony). As the Village develops its community water system, it will also review and implement as appropriate other measures that will promote water conservation, such as: (a) the use of water meters to measure usage and assign the cost of such usage; (b) the development of a water user fee structure to promote responsible usage and conservation; and (c) outdoor sprinkling regulations. We recognize that receiving an allocation of Lake Michigan water carries with it responsibilities to protect and preserve this vital resource, and the Village has every intention to fulfill its responsibility.

D. Conclusions and Commitment

If the Village receives its allocation of Lake Michigan water, the Lake Michigan water supply will promote the long-term planning and growth initiatives of the Village, and it will meet the future demand for water. With Lake Michigan water, Long Grove will have an adequate and reliable water supply that will ensure the health and safety of its residents. Lake Michigan water will serve residential, commercial, and industrial users within the corporate limits of Long Grove through its new municipal water distribution system. The Village will also rely on the water supply for essential municipal and public safety functions, including fire protection.

The benefits for the Village will be complemented by the benefits for other communities in the region that are dependent on groundwater, as the allocation of lake water for the Village and the other Planning Group members will reduce the overall demand upon groundwater sources, which will increase the relative capacity of aquifers.



LAKE MICHIGAN WATER ALLOCATION HEARINGS

WRITTEN TESTIMONY OF JOSEPH CHICZEWSKI, ESI CONSULTANTS
VILLAGE ENGINEER, VILLAGE OF LONG GROVE

I. INTRODUCTION AND BACKGROUND

My name is Joseph Chiczewski. I am the President of ESI Consultants, Ltd. ("ESI"), with offices in Naperville, Charleston, Chicago, and Elizabeth, Illinois. ESI, and myself in particular, have served as the Village Engineer for the Village of Long Grove since March 2004.

As Village Engineer, ESI provides a full range of engineering and related consultant services to the Village. Such services include roads, trails, storm water management, and review of all engineering plans for private development, including sewage disposal systems and water systems. ESI has also helped the Village in assessing long-range capital plans for Village infrastructure, including sewerage and potential water systems. In fact, ESI is currently developing plans for the first phase of a Village water system to serve properties in southeastern Long Grove along Illinois Route 83 between Old McHenry and Aptakisic Roads.

I am a registered professional engineer, and my qualifications are set forth in Exhibit A to this Testimony. A brief statement of the qualifications of ESI is also attached as Exhibit B to this Testimony. As President of ESI, I am familiar with all aspects of its operations and activities.

II. THE VILLAGE'S WATER SYSTEM

A. Current Conditions

The Village of Long Grove currently has no public water system to serve its approximately 8,400 residents. Rather, properties in the Village are served either by on-site private wells or as part of community wells established at the time a particular subdivision was established. Most on-site wells rely on shallow aquifers (<200 feet) for their water supply; the

water usage from these shallow wells is approximately 590,000 gallons per day. At the same time, there are 10 deep wells serving larger subdivisions and business developments that rely on deep wells tapping into the Cambrian-Ordovician Aquifer for approximately 250,000 gallons per day. Thus, the current water usage in the Village is approximately 70% reliant on shallow wells, and 30% reliant on deep wells.

As noted above, ESI is developing plans for the beginnings of a Village water system along Route 83 (the "Water SSA System").¹ The Water SSA System is anticipated to be supplied via two deep wells, and it will initially serve approximately 50 acres of land expected for, or actively used for, commercial development. There is also the expectation that the Water SSA System will be expanded to serve the Village's historic downtown business district. The downtown business district includes many wood frame buildings located in close proximity to each other that are being served by shallow private wells whose capacity is already stressed. Thus, the development and future expansion of the Water SSA System will improve fire safety in the downtown area.

Although the Village has no direct experience with such deep wells, the deep well aquifer is very susceptible to radiological contamination from Radium 226 and 228 and Barium. In order to reduce the impact of these radioactive isotopes, the Village's Water SSA System is being developed with treatment facilities in order to reduce the contamination of these radioactive isotopes in the ground water to below the 5 pico-curies limit established by the Safe Drinking Water Act.

B. Future Plans

As Village Engineer, ESI has investigated the possibility of having a Village-wide water system intended to serve each and every property. Because of the vast size of the Village

¹ The Water SSA System is being financed through a special service area in which the owners of four property holdings have agreed to pay for the estimated \$3.2 million cost of the Water SSA System.

(approximately 18 square miles) and relatively modest population resulting from its generally low-density development, a system to serve every property in the Village is not cost-effective (whether through use of groundwater supplies or Lake Michigan water), and this analysis has been confirmed in a Village-wide referendum.

Nevertheless, there are many areas of the Village that could and would benefit from being served by a reliable Village water system. The Water SSA System that is currently under development will be an important first step to providing such water service, but the expansion of any Village system will necessarily be incremental and is likely to focus on either non-residential areas, new residential developments, or those existing residential developments with failing or troublesome water sources (whether as part of a community well system or individual on-site systems).

In assessing the future opportunities for the Village to provide water to its residents, ESI had undertaken an initial draft "Village Wide System Study for Village of Long Grove, Illinois" (the "Initial Water System Study"), which was included in Appendix A to the "Application for Water Allocation Permit for Lake Michigan Water, Village of Long Grove, Lake County, Illinois, June 2009" that Applied Technologies submitted to the IDNR on behalf of the Village (the "Allocation Application"). ESI has further reviewed the opportunities for developing a Village water system, and its conclusions are included in a draft February 15, 2010 "Amendment to the Village Wide System Study for Village of Long Grove, Illinois" (the "Water Study Amendment"), a copy of which is attached as Exhibit C to this testimony and made a part of this testimony.

One of the key elements of the Water Study Amendment is the identification of a Conceptual Phase 1 Water Supply System, as well as an estimate of probably costs for developing the Phase 1 system. Although the Initial Water System Study determined that the average cost for delivering water to *every single lot* in the Village was \$77,325, the Water Study

Amendment concludes that the average cost for lots to be served by the Phase 1 Water Supply System will be approximately \$45,000. The Water Study Amendment also suggests that there are some properties in the Village for which public water simply may not be reasonably available in the current planning horizon.

The Phase 1 Water Supply System accomplishes two critical goals. First, it addresses critical locations where residents have documented serious concerns and complaints about the quality and quantity of their shallow well aquifer. Second, it takes eight regional deep well systems off-line and converts them to Lake Michigan water. Development of the system beyond the implementation of Phase 1 would likely incrementally occur over a much longer time horizon. Expansion to some of these Phase 2 areas will be more cost-effective than others.

One other point that should be noted. In considering the costs of providing Lake Michigan water via a Village water system, ESI assumed that the Village would obtain Lake Michigan water from the planned system of the ten-member Planning Group who have filed coordinated allocation applications. If the Village were able to secure water from either of the existing water systems that currently have facilities just outside the Village boundaries (*i.e.*, the Northwest Water Commission and Central Lake County Joint Action Water Agency), the actual water supply costs for the Phase 1 Water Supply System would be cut significantly (potentially by as much as half).

In summary, while any effort to provide water to every lot in the Village would initially be cost-prohibitive on an average lot basis if undertaken all at once, the Water Study Amendment makes it clear that by developing a more focused Village water system that serves the areas most in need or most easily reached by distribution lines, the critical goals may be accomplished and such an initial system is attainable at a very reasonable cost.

III. NECESSITY FOR ALLOCATION

A. Necessity for an Allocation—Local Perspective

There are several issues that demonstrate and support the Village of Long Grove's need for a Lake Michigan water allocation. As illustrated in the application materials, these include the quality of ground water, increased strain on ground water supplies from shallow wells, potential contamination of deep well water, and long-term sustainability of the deep well/aquifer water supply:

1. Ground Water Quality: The quality of ground water in Long Grove is often viewed as unsatisfactory to many residents. The degree of hardness in the water has been measured as among the highest in the Chicago metropolitan area, and this results in lime build-up in pipes, humidifiers, and water heaters, which in turn decrease the efficiency and longevity of such systems and appliances. Similarly, high iron levels in the ground water are also quite common, resulting both in staining of fixtures and susceptibility to iron bacteria. Some areas in the Village also experience high levels of dissolved hydrogen sulfide, resulting in unpleasant odors and related annoyances. While none of these conditions present immediate public health problems, they are not optimal and they encourage use of other technologies (e.g., water softener systems) that increase costs.
2. Shallow Well Sustainability: Although 70% of the Village's water use is drawn from shallow wells, it is not reasonable to expect this trend to continue. In 2005, Village residents experienced numerous incidents of well failures, and the risk of additional failures increases. As a result, over the past five years, the Village has required all major residential and commercial developments to serve their water needs through deep wells. But, as discussed below, deep wells face potential problems as well.

To the extent that shallow wells are in use, the demand upon the aquifers is already intense and grows more severe with each passing year. As development continues, not only will demand on the shallow sand and gravel and dolomite aquifers increase, but the impervious surfaces from development will diminish the recharge to the aquifer. Thus, the shallow wells are in a downward spiral in terms of their ability to sustain the demand for adequate and safe water supplies.

With regard to the Long Grove service area in particular, given the heavy reliance on private shallow wells, the shallow aquifers are not adequate to provide a reliable public water supply. With the projected growth of the Village service area, the variability of the sand and gravel aquifers in this area, the thinness of the aquifers that are present,² and the need to provide adequate separation between the wells to avoid operational interference, the likelihood of successfully developing the needed capacity in the shallow aquifers under the service area is very low.

As noted above, shallow groundwater supplies also present other challenges in terms of the hardness, iron, hydrogen sulfide, and related quality issues and the resultant need for increasingly more extensive treatment. While the need to treat water is not limited to groundwater, the fact is that growing communities require multiple wells in order to utilize groundwater sources and provide sufficient reliability and redundancy in their water supply, which means that either there is a cost to transport the water to a common location for treatment, or the cost of treatment must be replicated in multiple locations.

This is the case for the Village service area. High iron content requires localized treatment for iron removal. It is expensive or impracticable to consolidate treatment in a

² Woller, D. M., and Gibb, J. P., 1976, "Public Groundwater Supplies in Lake County," Bulletin 60-20, Illinois State Water Survey.

single facility where wells, by hydrologic necessity, and areas with immediate demand, are widely dispersed.

Adding to the concern as to the reliability and sustainability of the shallow aquifers is the potential for contamination of the source of supply that may render the wells unusable without additional means of treatment. Shallow wells are susceptible to contamination from the surface both in terms of a chemical spills in the recharge area and the normal use of road salt on the area roads.

3. Barium and Radium 226 and 288 Contaminations: Although the Village does not have data for the deep wells in Long Grove, deep wells in nearby communities that draw from the same Cambrian-Ordovician Aquifer have contained one or more of these elements above the maximum allowable limit set forth in the water quality drinking standards. Expensive treatment systems have been implemented in nearby communities, and similar treatment systems may be necessary in the Village system that is currently under development. These treatment systems have substantially increased the costs to operate water plants in nearby communities due to rising electrical costs and costs of commodities, such as salt. Additionally, there are growing concerns with the disposal of the effluent from the back washing of water treatment plants, as this contains elevated amounts of barium and radium. The concern is that this material will not be allowed to be treated by wastewater treatment plants, but may have to be treated and disposed of as special or hazardous waste. Should this occur, the ongoing operating costs of the treatment facilities in the Village's water system would rise significantly.

Utilizing Lake Michigan surface water rather than ground water from deep wells would eliminate both the need for the special treatment facilities and the disposal of the waste generated by these treatment facilities.

4. Long term sustainability of the deep aquifer: As the Village's reliance (and the reliance of other communities) on the deep aquifer for its supply of drinking water increases, the sustainability of that source decreases. Past history of the deep aquifer shows that this aquifer was unable to meet the demand of a 180 mgd back in the 1980s. During that time, the aquifer was declining at an increasing rate until the large majority of inner suburbs formed two intergovernmental water entities -- Northwest Municipal Suburban Joint Action Water Agency and Northwest Water Commission -- and got off the aquifer by switching to Lake Michigan as their water source.³ After this occurred, the aquifer recharged and remained steady for a time. But as of 2007, the demand on the aquifer has increased from the minimum of 63.3 mgd in 1993 to 72.47 mgd in 2000 and 84.40 mgd in 2004.⁴

More recent data shows a direct impact on the Village of Long Grove due to increased water demand. Based on a study of deep well levels, the cone of the deep aquifer under the nearby community of Lake Zurich has caused the levels in all of its wells to decline (one well having declined 50 feet), and wells in Wauconda have suffered a similar decline.⁵ These declines constitute percentage drops in available aquifer area of up to 20% in only the seven year period from 2000-2007. This is very surprising, in light of the fact that many of the immediately surrounding communities are now receiving Lake Michigan water through the Central Lake County Joint Action Water Agency, the Northwest Water Commission, and the Northwest Suburban Municipal Joint Action Water Agency, thereby reducing their draws on the deep aquifer.

³ Stephen L. Burch and H. Allen Wehrmann, Illinois State Water Survey, A Summary of Pumpage from the Cambrian-Ordovician Aquifers of Northeastern Illinois, 2000-2004 (Data/Case Study 2007-03, 2007), pp. 1-2.

⁴ Id. at pp. 1, 8.

⁵ Id.

The available data shows that the situation is no better in Long Grove. According to the same study, the cone of the deep aquifer in the vicinity of the Village of Long Grove has declined precipitously:⁶ specifically, the water levels for the deep wells serving the Briarcrest subdivision have declined approximately 12% over the seven-year period of 2000-2007.⁷ Moreover, there is every reason to believe that this trend will continue.

To exacerbate the problem, further growth is anticipated to the west of the Village of Long Grove. The recharge area for the Cambrian-Ordovician aquifer is located to the west of the Village, with recharge believed to occur near the Rockford area. As growth continues to the west beyond Village limits toward Rockford, this new growth will be relying on the Cambrian-Ordovician aquifer for its water source. Through past experience, we have observed that when the demand on the aquifer approaches 180 mgd, the aquifer is unable to sustain the demand.⁸ With the anticipated population growth in the Chicagoland region, it is not a question of if the aquifer will hit a demand of 180 mgd again, but rather a question of when. Additional growth to the west of the Village of Long Grove will be tapping the aquifer and eventually prevent groundwater from getting to the area where it would be usable by the Village.

Where water is supplied from the deep Cambrian-Ordovician sandstone, the aquifers are being stressed not only by ongoing and increasing demands in northeastern Illinois but also in southeastern Wisconsin. The on-going water supply study⁹ of the Southeastern Wisconsin Regional Planning Commission (SWRPC) projects that groundwater use in

⁶ Stephen L. Burch, Center for Groundwater Science, Illinois State Water Survey, A Comparison of Potentiometric Surfaces for the Cambrian-Ordovician Aquifers of Northeastern Illinois, 2000 and 2007 (December 2008), p. 1, 21.

⁷ *Id.*, p. 38. See also the map Exhibit D to this testimony.

⁸ Stephen L. Burch and H. Allen Wehrmann, Illinois State Water Survey, A Summary of Pumpage from the Cambrian-Ordovician Aquifers of Northeastern Illinois, 2000-2004 (Data/Case Study 2007-03, 2007), pp. 8-9 and Figure 2.

⁹ Southeast Wisconsin Regional Planning Commission, "A Regional Water Supply Plan for Southeastern Wisconsin," unpublished draft, Planning Report No. 52.

Kenosha County will increase from 0.3 million gallons per day (mgd) in year 2000 to approximately 6.5 mgd by 2035; a good portion of which will have to come from the deep sandstone aquifers.

In light of the changes in and continuing stress on the aquifer levels serving Long Grove, if one examines the water level in the sandstone aquifers as well as the uppermost St. Peter formation in the area,¹⁰ and then extrapolates the impacts of increased pumpage in the region, it is reasonable to expect the water levels to continue to decline and will reach the top of the sandstone aquifer within 50 years. Once this occurs, the production rate of aquifer will likely decline at an accelerated rate as the aquifer is dewatered. This is not a sustainable water supply situation. For this reason, sandstone aquifer water supply facilities using the St. Peter and Galesville aquifers should be considered interim supplies -- but these too will need replacement or major supplement within a reasonable planning horizon.

Drilling deeper and mining the deeper Mt. Simon sandstone aquifer could extend the duration of water supplies for a short period, but eventually the fresh water lens found in the upper portion of that formation will be exhausted, and the water supply will become unacceptably brackish. This was the pattern of development in northern Cook County in the 1980's.

In sum, unless there is a materials change in the source of potable water, Long Grove and its neighboring municipalities face an increasingly dismal prospect for serving their communities with a reliable and adequate water supply. While there is one of the largest fresh water bodies in the world at the eastern edge of our county, communities like Long

¹⁰ Burch, S. L., 2008, "A Comparison of Potentiometric Surfaces for the Cambrian-Ordovician Aquifers of Northeastern Illinois, 2000 and 2007," Case Study 2008-4, Illinois State Water Survey; Hughes, G. M., et al., 1966, "Bedrock Aquifers of Northeastern Illinois, Circular 406, Illinois State Geological Survey.

Grove that are near but not adjacent to Lake Michigan cannot individually create a water system using Lake Michigan as a water source. For this reason, the Lake Michigan Allocation applications of Lake County and the other Planning Group members create a unique opportunity because of the cooperative efforts involved. Moreover, because the total amount of allocations available for Lake Michigan water is finite, the ability to create new water systems like that contemplated by the Planning Group is not going to be a viable option for long.

The Lake County Strategic Plan includes providing "a reliable and sustainable supply of safe, clean drinking water to County residents." Only Lake Michigan water offers an adequate, reliable, long-term source of potable water, but Lake Michigan as a water source would be beyond reach if Long Grove attempted to "go it alone."

5. Fire Protection Enhancements: The Lake Michigan water system also provides a more reliable supply of water to the Village for fire protection purposes. Future expansion of the Village's water system is limited by the capacity of its wells and, in turn, the ground water supplies. A more reliable long-term water supply from Lake Michigan would have a significant impact on fire protection services within the served areas as these areas would not be dependent on trucking water in or utilizing pond water to fight fires.
6. Cost of Supply: On a regional level, the multi-community cooperative effort of the Planning Group will ensure that a maximally efficient supply of water is provided to communities throughout Lake County.

While a shorter-term view suggests, as does the report of Applied Technologies in the Village's Application, that the Lake Michigan water supply through the system contemplated by the Planning Group is no more cost-effective than ground water as a water supply for the Village, the Village believes that this is not the only analysis that can

and should be taken in determining how it can achieve a long-term, reliable, and predictable water supply. While the Lake Michigan water supply alternative that is outlined in the application may not be as cost beneficial to Long Grove as it is in other communities, the Village is geographically positioned in a unique location to engage in serious consideration of other alternative intergovernmental water systems that may have a substantially lower cost.

One such alternative is to obtain a Lake Michigan water supply through the Central Lake County Joint Action Water Agency ("CLCJAWA"). This agency has expressed an interest in expanding its service and Long Grove would be an ideal candidate, with mains from the CLCJAWA system located just beyond the borders of Long Grove. The same can be said of the Buffalo Grove water system, which is part of the Northwest Water Commission.

Due to its location, regardless of its ultimate source of Lake Michigan water delivery, the Village is in a unique position to facilitate emergency interconnections between all three intergovernmental water agencies. Should an allocation be granted, the Village would investigate various means of supply in addition to the Planning Group, such as these two systems as well as others having access to Lake Michigan water, in order to determine the most cost affective solution.

B. Necessity for an Allocation—Local & Regional Conservation Efforts

If an allocation of Lake Michigan water is received and as the Village develops its own water system, the Village will be in a position to undertake significant local and regional water conservation efforts.

Local water conservation efforts would likely include the following programs:

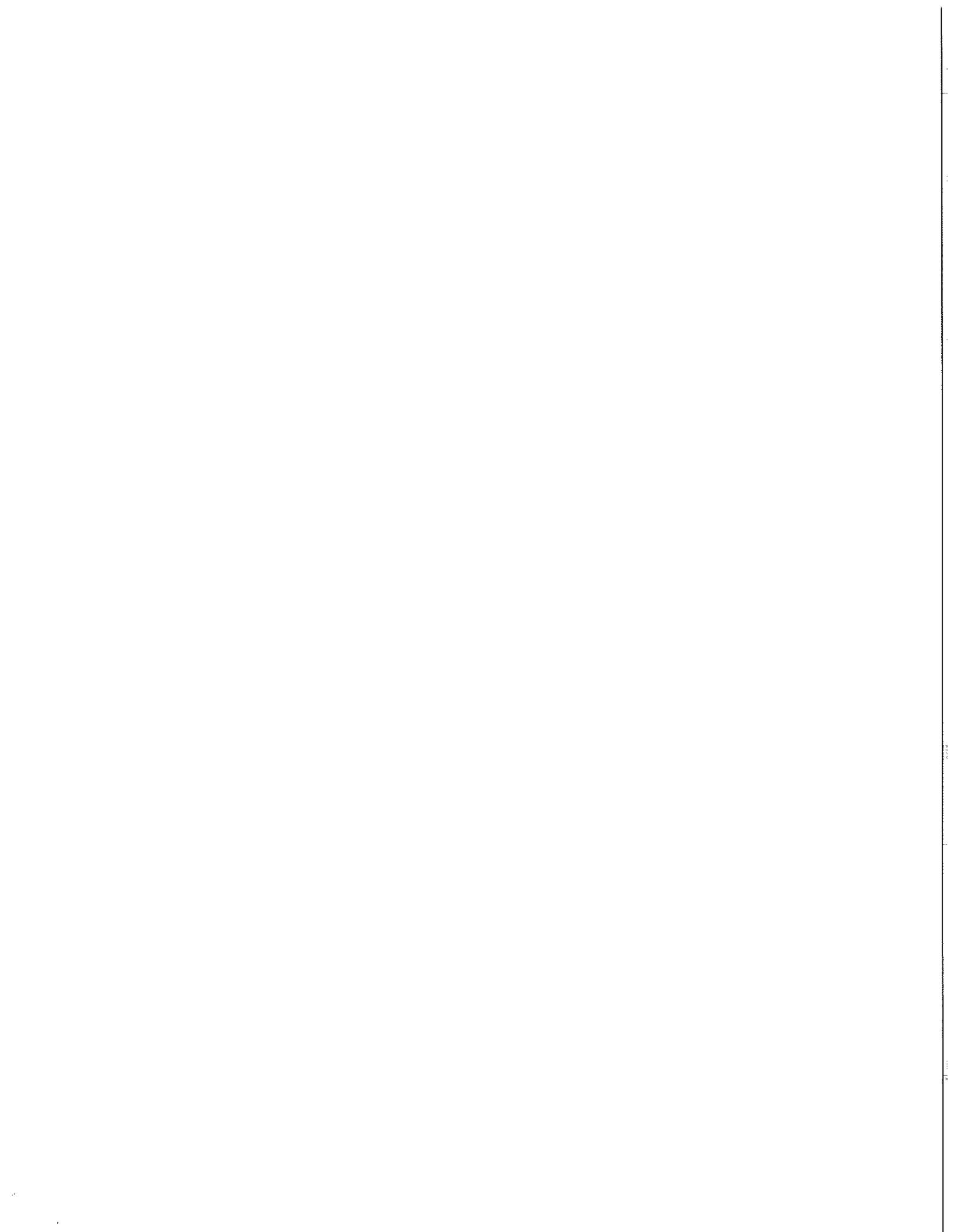
1. Meters and User Fee Programs. Users of the Village water system would be required to meter water usage, so individual users would be accountable for the volume of water used. Additionally, the Village would develop a user fee system that would tie the cost of usage to the volume of water consumed. In combination, this would establish economic incentives for individual users to conserve. In addition, the Village will explore using "smart" water meters that will not only allow for automated meter reading, but could be used to audit and diagnose problems in the field such as meters that are not running and dramatic changes in water use that can be used to notify homeowners of potential leaks and wasteful uses.
2. Low Flow Devices. One of the largest impacts to water conservation was the adoption of the Energy Policy Act (EPACT) of 1992. This federal law regulates the volume of water flow for various plumbing products (toilets, urinals, faucets and showerheads) to improve water conservation. Manufacturers are required to comply with these regulations. Since this is a federal mandate, local adoption is not necessary. Nevertheless, the Village recently adopted Ordinance No. 2009-O-32, which updated its building and plumbing codes to provide for various conservation-minded requirements, including low-flow plumbing fixtures and hot water recirculation elements in new construction.
3. Outside Water Use Rules. The Village of Long Grove intends to adopt a water conservation ordinance for outside water usage. Although the Village does not currently have jurisdiction to regulate private well usage in this regard, with the establishment of a Village water system, such regulations can be imposed.

C. Local Usage and Commitment

Obtaining a Lake Michigan water allocation is an integral component of ensuring the health and safety of the residents of and businesses in the Village of Long Grove. If awarded an allocation, the Village will supply Lake Michigan water to residential, commercial, and industrial users within its corporate limits through its municipal water distribution system as that system develops. The Village will also rely on the water supply for essential municipal and public safety functions. It is anticipated that the consumptive use of water in the Village will be as set forth in the Application, as updated, and the allocation of use will be apportioned in the manner described in the updated Application (see Testimony of Frank Tiefert and exhibits thereto).

The current proposed point of diversion is in Zion through the Lake County Public Water District.

The location of discharge is through either (a) private, on-site disposal systems, (b) the Lake County Des Plaines River Sewerage Treatment Plant in Buffalo Grove, which is tributary to the Des Plaines River, or (c) the Lake County Diamond/Sylvan Lake Sewerage Treatment Plant. Water will not be treated or otherwise altered or changed by the Village of Long Grove. The Water Study Amendment offers a more detailed breakdown of the sewage treatment methods employed in the Village. It should be noted that a substantial portion of the Village is already serviced by regional systems or by sanitary sewer service (or is in a recapture area for sewer expansion) from Lake County Public Works.



VILLAGE OF LONG GROVE
LAKE MICHIGAN WATER ALLOCATION APPLICATION
TESTIMONY OF FRANK TIEFERT

My name is Frank Tiefert. I am a licensed professional engineer working at the engineering firm of Applied Technologies. Statements of my personal qualifications and the experience of Applied Technologies are attached to this testimony as Exhibit A and Exhibit B, respectively.

The Village of Long Grove has been working collectively with the County of Lake, the Village of Antioch, the Village of Fox Lake, the Village of Hawthorn Woods, the Village of Lake Villa, the Village of Lindenhurst, the Village of Lake Zurich, the Village of Volo, and the Village of Wauconda to explore the possibility of creating a joint action water agency ("**JAWA**") to supply Lake Michigan water to communities throughout Lake County. (Collectively these communities are referred to as the "**Planning Group**"). Applied Technologies prepared for the Planning Group an initial and supplemental "Lake Michigan Water Feasibility Study" to determine preliminarily if the members of the Planning Group could jointly provide cost-effective water service using Lake Michigan as a water source, while meeting the State of Illinois objectives of reducing withdrawals of groundwater from the Cambrian-Ordovician Aquifer. These studies confirmed that the Planning Group could collectively utilize Lake Michigan water to provide cost-effective water service to the member communities and reduce withdrawals from the Cambrian-Ordovician Aquifer.

In addition to work for the Planning Group, Applied Technologies prepared an application for allocation of Lake Michigan water on behalf of the Village of Long Grove for submission to the Illinois Department of Natural Resources as well as supplemental information that was submitted later (collectively, the "**Application**"). The original application prepared for the Village of Long Grove is attached to this testimony as Exhibit C and the supplemental information is attached to this testimony as Exhibit D. In addition, an updated "Application for Permit to Withdraw Lake Michigan Water" form is attached to this testimony as Exhibit E. (Exhibits A-E are all incorporated into this testimony by reference.) With the exception of the additional information provided in this written testimony, the Application serves as the report and testimony of Applied Technologies vis-à-vis the Village of Long Grove's request for a Lake Michigan water allocation.

Application Update

Since June 2009 when Long Grove initially filed its original application (Exhibit C), the Village has further reviewed the then-existing and supplemental data. In doing so, it has revised its projections for initial and longer-term demands for Lake Michigan water (Exhibit D). While this further review has not fundamentally changed the analysis in the original application, I have updated the IDNR application form to set forth more clearly the revised projections for the Village's Lake Michigan water needs (Exhibit E).

With respect to the revised application form (Exhibit E), it should be noted that Sections II and IV relate to water usage and demand that is expected to transition to Lake Michigan water sources during the 2030 planning horizon. Section III, on the other hand, addresses Village water usage as a whole – including those portions of the Village that are not expected to utilize Lake Michigan water at the outset.

In addition, I note that the Planning Group has already begun meaningful discussions with the Lake County Public Water District ("LCPWD") rather than deferring such discussions until after the conclusion of the allocation hearings as was contemplated at the time of the original application (Exhibit C, p. 3-3).

In all other respects, the Application as originally filed remains unchanged.

The Challenge of Providing Potable Water

Although the application submitted by the Village of Long Grove relates specifically to a single community, it is critical to consider the issue of water supply as a regional issue affecting all of northern and western Lake County. Lake County has diverse water sources and many different local governmental units with interests and authority to address potable water issues. Such diversity presents a risk of uncoordinated and even conflicting water strategies. A recent report has noted that Lake County has pursued an orchestrated approach to water management that is necessary to ensure that all residents of the county have access to clean, safe, affordable water. Regional water planning is critical in Lake County because of anticipated population increases of 20% during the 25-year window between 2005 and 2030.¹ In particular, there are several challenges associated with drawing water from the aquifers located in northwestern Lake County to serve this burgeoning population. First, changes in land use will accompany this projected population increase, which in turn reduces the aquifer's recharge

¹ *The State of Lake County's Water Supply*, Integrated Water Resource Planning Group, Lake County, Illinois (May 2008).

potential.² Second, it is reported that there has been a decrease in groundwater levels in the Cambrian-Ordovician aquifer, which translates into declining groundwater levels in Lake County and in many other counties situated in northeastern Illinois. A particular decrease in water levels at the Village of Long Grove's cone has been noted.³ Third, in addition to decreasing groundwater levels, water from the deep aquifer frequently requires costly treatment processes before it can be distributed to area residents.

Another recent report noted that significant projected growth in water withdrawals in Northeastern Illinois "make a compelling case for the need to manage regional water demands."⁴ Failure to properly allocate water resources among Lake County communities will have particularly devastating effects on those areas in western Lake County and beyond that cannot independently access Lake Michigan water and are thereby reliant on groundwater from the declining aquifer. The Planning Group's collective efforts to obtain Lake Michigan water allocations and to establish a JAWA to provide Lake Michigan water to members' respective service areas is an important component of water management at the County and broader regional levels.

Lake Michigan Water: The Preferred Option

As noted above, Lake County has a diverse water supply and members of the Planning Group could potentially meet the demand for water through use of groundwater or Lake Michigan water. It is my position that Lake Michigan water is the preferable option for the Village of Long Grove and for the Planning Group as a whole to obtain its water supply. Pursuing groundwater as a water supply source would require increasing system capacity. Furthermore, to provide groundwater of a quality equivalent to the quality of Lake Michigan water would require costly treatment processes. Most importantly, even though the cost of using groundwater as a water supply is roughly equivalent to the cost of using Lake Michigan water in Long Grove, when considered in the light of the uncertain long-term reliability of groundwater, reliance on ground water supply is particularly problematic for the Village of Long Grove and Lake County as a whole in light of the recent reports of aquifer decline cited above.

² *The State of Lake County's Water Supply*, Integrated Water Resource Planning Group, Lake County, Illinois (May 2008).

³ Stephen L. Burch, Center for Groundwater Science, *A Comparison of Potentiometric Surfaces for the Cambrian-Ordovician Aquifers of Northeastern Illinois, 2000 and 2007* (December 2008), p. 1, 21.

⁴ B. Dziegielewski & F.J. Chowdhury, *Regional Water Demand Scenarios for Northeastern Illinois: 2005 – 2030* (June 5, 2008), p. Es-16.

In fact, the precipitous drop in water levels of deep-wells serving Long Grove during the past few years⁵ makes an allocation of Lake Michigan water plainly appropriate, irrespective of cost-effectiveness. The challenges and costs of providing water from deep-well sources are overshadowed by the uncertain prospects of a long-term reliable water supply for Long Grove. Additionally, because Long Grove is in close proximity to several existing or contemplated supply lines for Lake Michigan water, replacing groundwater sources in Long Grove with Lake Michigan water will reduce withdrawals from the Cambrian-Ordovician Aquifer and thereby preserve this water source for other communities far too distant from Lake Michigan supply lines to have a meaningful alternative for potable water.

In the context of the Planning Group, it becomes readily apparent that the Village of Long Grove's application for a Lake Michigan water allocation will advance regional public policy priorities concerning water supply, conservation, and preservation of groundwater in the Cambrian-Ordovician Aquifer. In fact, the coordinated efforts of the Planning Group members will cause conservation measures to have a greater effect because they will apply in numerous communities. For example, if rates were adjusted by the proposed JAWA to encourage conservation, such conservation measures will have a broader and more immediate impact because they would be applied across a larger region.

The success of the Planning Group in obtaining Lake Michigan water allocations will ensure that the members of the Planning Group can collectively work to mitigate the negative effects of increased population and changing land use on the regional groundwater supply throughout Lake County.

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⁵ Stephen L. Burch, Center for Groundwater Science, *A Comparison of Potentiometric Surfaces for the Cambrian-Ordovician Aquifers of Northeastern Illinois, 2000 and 2007* (December 2008), p. 38 (Briarcrest).