July 3, 2019

Kurt Woolford
Chief Engineer
Lake County Stormwater Management Commission
500 West Winchester Road
Libertyville, IL 60048

Dear Mr. Woolford,

As you and your colleagues update Lake County’s Watershed Development Ordinance in the coming months, we thank you for requesting public input regarding the stronger and more frequent rainfall events that have been experienced and documented for Lake County and the surrounding region. We are grateful for the protections, enforcements and educational services already in place, made possible since 1990 by the Lake County Stormwater Management Commission, and replicated in counties throughout Illinois and beyond. We applaud your continued leadership on this issue that is increasingly impacting a growing number of residents across a wider range of locations throughout the county.

Openlands is one of the nation’s largest and oldest nonprofit conservation organizations in the region. Founded in 1963, Openlands protects the natural and open spaces of northeastern Illinois and the surrounding region to ensure cleaner air and water, protect natural habitats and wildlife, and help balance and enrich our lives. As an accredited land trust, Openlands owns four properties, including its flagship Openlands Lakeshore Preserve in Highland Park, and holds 24 conservation easements on 1,510 acres in Lake County, with an additional 3,795 acres in the surrounding region. Overall, Openlands has collaborated with agencies across the metropolitan area to directly protected over 15,000 acres of land. On behalf of our supporters, approximately 2,000 of whom live in Lake County, please consider the following recommendations.

As storms continue to be more frequent and intense, and homes, roads and businesses increasingly flood, we agree with you that using the best available data on past stormwater events is a critical first step in deciding how much we need to slow and capture rain and snowmelt to protect Lake County from future damage. In March of 2019, the Illinois State Water Survey (ISWS) updated Bulletin 70, which analyzes the amount of daily precipitation from 1948
to 2017 to gauge the frequency of storms in Illinois.¹ Updated Bulletin 70 documents that rain
and snowfall in Illinois increased by 11% over the past century. As the Lake County Stormwater
Management Commission notes in its May 16, 2019 Interim Guidance Memo, the ISWS found
that Lake County is receiving between 20% and 45% higher rainfall amounts in 2017 than in
1983.

In July 2017, the Illinois Emergency Management Agency reported that over seven inches of
rain fell on Lake County within 24 hours. Flash floods inundated thousands of homes and
businesses and made roads impassable. Rivers overflowed into communities, taking longer for
floodwaters to subside. The governor declared a state of emergency. While catastrophic, this
storm is not an isolated incident. Lake County set a new flood stage record in 2018, with triple
the average number of flood events that went above flood stage over the last decade. We are
on track to break that record in 2019.

These storms have cost Lake County residents and businesses dearly. In 2015, the Illinois
Department of Natural Resources documented a cost of $2.3 billion in urban areas over the
span of 10 years, with $1.6 billion in damages resulting from five severe storms. According
to the Illinois State Water Survey, 90% of this damage occurred outside the general floodplain. In
July 2017 alone, Lake County received over 3,500 responses from residents about the extent
they experienced storm damage.

As demonstrated in a report released by the Center for Neighborhood Technology on “The Prevalence and Cost of Urban Flooding²,” damage to homes and storefronts is often
underrepresented and underreported, especially when storm events don’t qualify for FEMA emergency funding. Between 2007 and 2011, 181,000 insurance claims were made across 97
percent of Cook County ZIP codes, amounting to $773 million. CNT found through an extensive online survey that 84 percent of the people that responded suffered stress and 13
percent ill health. Forty-one percent lost the use of part of their property, 63 percent lost

(hereinafter “Updated Bulletin 70”).

² “The Prevalence and Cost of Urban Flooding,” Center for Neighborhood Technology: A Case Study of
Cook County, Illinois (May 2014) (hereinafter “CNT Report”).
valuables and 74 percent lost hours of work to clean up. CNT cited to 2012 research indicating the economic and social consequences can be considerable:

“Experts estimate that wet basements decrease property values by 10-25 percent…. According to FEMA, almost 40 percent of small businesses never reopen their doors following a flooding disaster. Between 2006–2010 the average commercial flood claim made to the NFIP amounted to just over $85,000.”
CNT Report at 1, 2.

Agricultural businesses are also heavily impacted. Wet conditions are delaying plantings, and a growing number of acres of farmland have become barren from persistent flooding.

As a landowner in Lake County, Openlands has experienced severe flood damage, including accelerated slumping of ravine and bluff slopes that is directly correlated with the volume of surface water moving over and down the slopes, and the saturation of the soil that reduces their angle of repose. To date, Openlands spent $7 million restoring the Lakeshore Preserve, with $3 million invested in making the site publicly accessible. Flooding, along with high lake levels, is the number 1 threat to the Openlands Lakeshore Preserve.

Stormwater affects ravines throughout Lake County. Multiple landowners often front each ravine. The damage is wide-spread and pervasive. Flooding also undermines investments by local governments, such as Highland Park, who are pairing their tax dollars with federal assistance, such grants by the U.S. Army Corps of Engineers and through the Great Lakes Restoration Initiative.

In 2017, the ISWS released rainfall forecasts for Lake, Cook, DuPage and Will Counties, which predicts that the severity and intensity of storms in Lake County will continue to rise. ISWS warned that the more intense and frequent urban flooding events would increase human, environmental and economic risks. It called upon urban communities that administer ordinances to manage floodplains and stormwater systems to address the public safety concerns, property damage and economic interruption from more severe weather.

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We agree that updating the Watershed Development Ordinance is one of the critical steps that Lake County needs to take to withstand and recover more quickly from flooding. Adopting Updated Bulletin 70 is a great start towards preventing the kind of storm damage we saw in the record-breaking 2017 event. However, using data from the past when we know we will flood more in the future means that we will, by default, build inadequate stormwater solutions that leave our communities vulnerable to loss.

To address this, we strongly recommend blending the Updated Bulletin 70 with midline sectional projections of how rainfall will increase over time in the four-county area so our communities stabilize and become resilient to increased flooding. Stronger regulatory standards and incentives will be critical in building the detention and green infrastructure needed to handle the increased ferocity of future storms. We will need to draw upon all of the tools at our disposal - from large enough detention basis and increased permeable pavement to nature-based best practices, such as increased tree canopy and restored landscapes to absorb increasing amounts of stormwater.

As Lake County SMC projects the need for $140 million to correct existing flood problems, we support establishing dedicated capital funding in the county budget, and leveraging programs such as the Illinois Green Infrastructure Grants program, State Revolving Loan Fund, Natural Areas Stewardship Act and the FEMA buy-back program to increase investments in a full range of stormwater solutions.

I. Lake County SMC Should Adopt Updated Bulletin 70 with Midline Projections of Future Storm Events to Build Adequate Protections Against Increased Flooding.

Data in the 2019 ISWS report substantiated what Lake County residents and businesses have been experiencing - we are flooding worse and more frequently than in the past. Updated Bulletin 70 would ensure that we build detention capacity to accommodate the proven increase in storm intensity over the last forty years. While that is critical, based on any the ISWS 2017 analyses of model projections, we know that detention sized for the past will be insufficient for the flooding we expect to experience mid to late 21st century.

The 2017 report doesn’t have the sectional numbers yet to state the midline projection of increased rainfall for the different models applied to the four-county area, which is statistically a better tool for looking at averages. That way, you don’t have statistical anomalies, with a single storm skewing the numbers. With that said, since those numbers aren’t yet available, looking at the Waukegan station in Lake County as an example, which has more complete periods of records during the heincast period, the CMAP 3 model indicates that this location is projected to experience an increase of .52 inches (from 7.28 inches to 7.8 inches) between 2050 and 2090 for a 100-year 24-hour design storm. That could calculate out to .013 inches per year, assuming the increase is linear.
Looking at both the current trajectory in the 2019 ISWS report and the myriad of future projections in the 2017 report, both are clear that storms are becoming more intense. Undersizing stormwater infrastructure will only exacerbate our existing flooding problem.

As a solution, we recommend breaking from the static reactive model of relying on past rainfall data. Instead, Lake County can integrate average scientific projections of precipitation over the design life of the type of stormwater infrastructure so that it is built to reduce flooding, with a goal of resiliency rather than damage control.

Alternatively, since the ISWS states in the Updated Bulletin 70 that precipitation has increased over the last few decades in a relatively linear trajectory, the Lake County SMC could supplement the Updated Bulletin 70 baseline with an indexed value that is based on the design life of a detention or retention project. Integrating this linear increase is more conservative than the projections in the 2017 ISWS report, but the added value is premised upon existing data, and is a predictable method to shift from a flat standard to a reliable incremental one.

Since the Updated Bulletin 70 adjusts the 24-hour rainfall up by 0.99 inches from 1983 to 2017, that would average out to an 0.03-inch increase per year. The Lake County SMC could require an additional 0.03 inches of storage for every year of the design life of the permitted construction. So, if a project were anticipated to have a lifespan of 30 years, the Lake County SMC would add 0.03 inches per year over that time horizon to the baseline Updated Bulletin 70 100-year 24-hour storm of 10.66 inches. The 0.03-inch index would adjust the total to 11.89 inches for the project if it were permitted this year. (The calculation would be: 30 years x 0.03 inches per year (or 0.9) + the baseline 10.66 from Updated Bulletin 70 to equal 11.89 inches of necessary capacity.) Lake County SMC would index the “starting point (10.66”) upwards by 0.03” each year after 2019 and every subsequent year until new data is available.

Since adopting Updated Bulletin 70 requires resizing infrastructure and nature-based solutions for more recent storms, we recognize that adjusting for an additional anticipated percentage will have a greater associated cost. However, it is important to balance this against the true cost of flooding, accounting for direct damages to structures as well as lost revenue from flooded roads, farms and businesses. Adequately sizing solutions also creates stability and certainty that businesses seek when determining whether to operate in Lake County. While public health and welfare is a factor that goes beyond statistics, resolving flooding in Lake County is essential to provide a quality of life and healthy environment for the people who live and work here.

II. Lake County SMC Should Strengthen Stormwater Regulations and Increase Incentives to Reduce Flooding with Green Infrastructure Best Management Practices.
Since we are on a trajectory of increasing rainfall, it will be important to (1) correctly size stormwater infrastructure, and (2) install adequate detention and retention to minimize or stop flooding. We recommend that the Lake County SMC adopt the 2012 scientifically derived numeric volume control standard to retain more rainfall. Additional volume control practices, such as green infrastructure, can dramatically slow and hold rain and snowmelt so that pipes and municipal stormwater systems have more capacity when they need it the most.

The value of green infrastructure in capturing rain where it falls is widely recognized across our region and nationally as an integral part of stormwater management. We appreciate the leadership of the Lake County SMC in increasing public awareness of the importance of green infrastructure, and incentivizing the use of these practices.

Neighboring counties have adopted or are considering numeric criteria much like the one developed by the Lake County SMC. In Cook County, the Metropolitan Water Reclamation District of Greater Chicago requires capture of one inch of rainfall. The City of Chicago requires retaining a half inch on smaller sites, and has discussed raising the bar to address its urban flooding.

The 2012 proposal by the Lake County SMC to adopt a numeric standard of capturing 0.82 inches of precipitation per storm event was grounded in sound science, local conditions and available technology. While the standard is based on static data, adopting it is a critical next step towards improving both flood conditions and the quality of Lake County waterways. Green infrastructure captures, filters and reduces certain pollutants that contaminate our waters. It slows and cools runoff, reducing erosion and sedimentation of our lakes and riverbanks.

Green infrastructure has both strong intrinsic and economic value, elevating both the quality of life of residents and providing ecosystem services value to surrounding communities. We appreciate that the Lake County SMC supports a full spectrum of green practices, recognizing the use of both built and nature-based solutions, such as expanding our tree canopy and landscape restoration.

Trees are proven to improve the quality of life and economic health of communities. According to the Chicago Region Trees Initiative:

Studies show that the size and health of the tree canopy directly relates to the benefits and services trees provide. Urban trees are part of the urban infrastructure, just like roads, storm sewers, or water mains. Every year, trees in the Chicago region intercept and absorb billions of gallons of stormwater.... The urban forest also provides important economic benefits such as ... improved sales in commercial areas (Wolf 2005). Trees provide important physical and mental benefits such as improved mental and physical health (Donovan et al. 2013; Villeneuve et al. 2012; James et al. 2016; Ulrich 1984), social cohesion
and community engagement (Dwyer et al. 1991; Kuo et al. 1998 and Kuo 2003), and provide important habitat for wildlife (Lindenmayer and Laurance 2017).

Restoring wetlands, streams and uplands into high quality natural areas, also provides a strong economic return on the investment. In 2016, Openlands and Stantec Consulting, Inc. published reports that demonstrated restoring 1,440 acres in the Forest Preserves of Cook County resulted in absorbing 110 million more gallons of stormwater per year, yielding an $8.3 to $1 return on project costs. The short-term gains of $10.6 million to the local economy from designing, constructing and maintaining the restoration work at Deer Grove East near Lake-Cook Road were twice the $5.3 million in associated costs. The project conveyed long-term economic benefits as well, with improved recreational experiences valued at $20 million and improved natural resource values (water quality and healthier landscapes) at $13.5 million. Together, the benefits of restoring Deer Grove East exceed $44 million.

We offer the methodology and information we learned from the modeling conducted by Stantec to augment the Lake County SMC Wetland Restoration and Preservation Plan now being developed to indicate the extent that nature-based solutions can provide an economic return for wetland functions. While the Stantec modeling is site specific, it underscores the magnitude that natural green infrastructure can benefit the bottom line for residents and businesses.

Openlands also offers to explore how Lake County could adapt Space to Grow into a program that benefits its own school districts and the surrounding communities in flood prone areas. Space to Grow transforms Chicago schoolyards into beautiful and functional spaces to play, learn, garden and be outside. The schoolyards use special design elements to help reduce neighborhood flooding.

The program is a successful partnership between multiple agencies and non-profits, with the common commitment to transform 34 schoolyards in Chicago. The partnership is co-managed by two organizations focused on different priorities: Openlands focuses on connecting people to nature where they live and Healthy Schools Campaign works to make schools healthier places for children to learn and thrive.

The model brings together capital funds, expertise and leadership from Chicago Public Schools, the Chicago Department of Water Management and the Metropolitan Water Reclamation District of Greater Chicago. Space to Grow maximizes financial investment from these two water agencies by designing schoolyards with green infrastructure features that absorb large amounts of water.

With more than 760 acres of impermeable surface in a highly urbanized area, Chicago Public Schools schoolyards present a significant opportunity for changing the way stormwater is managed in Chicago. The 34 schoolyards will be able to capture and hold over 5 millions gallons of stormwater at any given time. They will serve over 15,000 Chicago Public School students and their families, providing access to nature, outdoor classrooms, space for physical
activity and recreation and edible gardens to support nutrition education. To date, fifteen schoolyards are complete, five are on path for ribbon cuttings this fall, and five more schools will break ground this month. Space to Grow anticipates that five more schools will be constructed next year. The fifteen built Space to Grow schools currently capture 2,762,144 gallons per storm event.

All Space to Grow schoolyards include special materials, surfaces and techniques that capture significant amounts of rain, which is especially helpful during heavy storms. These include rain gardens, native plantings and gardens, permeable asphalt, permeable pavers, water storage under parking lots and turf fields, permeable rubber play surfaces and much more. Signage in each schoolyard interprets the green infrastructure process and its value for the school community.

III. Lake County SMC Should Support Federal Rules That Better Protect its Communities Against Flooding

In addition to adopting a version of the Updated Bulletin 70 that integrates projected increases in rainfall, and the previously proposed numeric volume control standard, we strongly recommend support of state and federal regulations that are necessary to prevent increased flooding and degraded water quality in Lake County. For instance, the proposed regulatory changes to the definition of Waters of the United States would restrict the U.S. Environmental Protection Agency and Army Corps of Engineers from regulating projects under the Clean Water Act that harm neighboring states. Water does not yield to jurisdictional boundaries. Both ephemeral and interstate waters would lose protections under the rule.

An example of how this would affect Lake County is the far-reaching effect of Foxconn in Wisconsin on the Fox River, Chain O’Lakes systems and communities downstream of the development. Wisconsin inadequately protects headwaters and wetlands particularly near the Foxconn Development, where there is already a deficit of approximately 55,000 gallons of compensatory stormwater storage for every acre developed. As these developments and commercial corridors expand, this deficit will explode throughout the Fox and Des Plaines River watersheds, resulting in downstream impacts in Lake County. Present and planned developments in Wisconsin’s EITM Zone totals nearly 2,100 acres within the Des Plaines River watershed. Runoff from the area travels downstream through Lake, Cook and Will counties before it drains into the Illinois River. Illinois waters will continue to be choked with sediment and inundated with stormwater from upstream sources and Lake County residents will increasingly experience severe flooding and basement backups. It is important to send a strong message to the U.S. EPA that it needs to retain authority to ensure all communities are competitive and resilient, so that places like Lake County aren’t sacrificed.
IV. As we contend with more rainfall, more investments will be crucial to upgrade existing systems to prevent homes and businesses from flooding.

We agree with the Lake County SMC that it is imperative that a reliable source of capital funding is available to address the $140 million in known flooding problems throughout Lake County. We support measures to adopt a secure annual appropriation to address this critical need. In addition, and in the interim, while it will never total what is necessary, Openlands encourages Lake County SMC to continue to creatively leverage public and private funding sources to partially bridge the gap.

For instance, the Illinois Capital Bill allocated $5 million annually for five years to the Illinois Green Infrastructure Grants Program. This, in addition to the State Revolving Loan Funds, could expand the number of green infrastructure projects in Lake County. In addition, with the rise of nature-based solutions, like the Deer Grove East project, the Natural Areas Stewardship Act and Great Lakes Restoration Initiative could supplement funding for initiatives that repair the hydrology and restore wetlands and other water-related landscapes to health. We know from studies like the one we performed with Stantec, that this can increase the stormwater retention of the site to benefit surrounding neighborhoods. Last, the FEMA buy-out program can aid people who regularly flood and want better living conditions. While these measures are not a surrogate for an adequate constant funding stream, they could serve in the interim to augment funding.

V. Consistent enforcement

While the Lake County WDO requires that projects must maintain adequate downstream capacity, it is crucial that this is done by designing for resiliency on a watershed scale. We recognize that Lake County SMC has long championed use of a watershed approach to water quality and stormwater management. We encourage greater scrutiny to ensure this capacity threshold is met as a safeguard against increased flooding.

VI. Conclusion

We applaud the Lake County SMC for their transparent and inclusive process to update stormwater protections for residents and businesses, and stand ready to assist you both as a regional organization and local landowner. We appreciate the leadership of the Commission and the Lake County Board in taking steps to address flooding as one of the challenges of our changing climate, and congratulate the county on its recent overwhelming support of the Paris Agreement. We believe Lake County is well equipped to meet this challenge, given its culture of land conservation and its residents’ investments in a significant and varied network of healthy, protected wetlands, woodlands and other natural areas and connecting landscapes.
Thank you again for this opportunity.

Sincerely,

Stacy Meyers
Senior Counsel
13-yr resident of Lake County

Sarah Surroz
Director of Lake County Programs
33-yr resident of Lake County