Groundwater aquifer depletion in a Great Lakes State: The effects of pumping restrictions in the North and East Metropolitan Area of Minneapolis and Saint Paul

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Abstract. Groundwater aquifer depletion in the north and east metro areas of Minneapolis and Saint Paul, Minnesota has led to groundwater pumping restrictions and the establishment of a Groundwater Management Area in a region known for its plentiful lakes, streams, and water resources. Municipalities, homeowners, and even golf courses are experiencing the effects of these groundwater use restrictions. The North Oaks Golf Club is investing in upgrades to its irrigation system to improve reliability. Without groundwater, what options are available to them? With plentiful surface water in this state, why not perform irrigation using lake water? Invasive species are present in all area lakes, with the potential to cause significant damage to pipes, pumps, and other supporting infrastructure. Filtration of these invasive species is costly and requires screening at the micron level. Pumping water from area lakes requires acquisition of water rights from the local water entities. On-site water storage is a potential solution, but well-draining sandy soils prevent the possibility of holding water for a sufficient duration, and hydrologic modeling showed that only one-third of the required irrigation water volume is available on-site. This presentation will focus on the many issues and complexities encountered during this seemingly simple project aiming to help the North Oaks Golf Club find a reliable source of irrigation water in the water rich state of Minnesota.