

Appendix G: Groundwater Quantity Programs Summary

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After the determination of a significant impact to Long and Plainfield Lakes was made and prior to establishing recommendations, the Wisconsin Department of Natural Resources (DNR) reviewed groundwater quantity management programs from other states. The DNR inventoried ten states to answer the following questions:

1. Are impacts to surface water features (lakes, streams, wetlands) considered when evaluating and managing groundwater withdrawals?
2. Does the state manage groundwater withdrawals cumulatively with respect to impacts to surface water withdrawals?
3. What level(s) of government manage groundwater withdrawals (state, regional or local)?
4. What management strategies are employed?

This review is not comprehensive or legal in nature. Rather, the DNR conducted a high-level review aimed at comparing how other states manage groundwater water withdrawals with respect to surface water resources. Some of the states DNR reviewed had extensive management programs; however, the program was focused on managing the aquifer rather than the groundwater / surface water interaction. Tables 1 and 2 summarize each state's approach to managing the surface water resources.

California

California has a state-level permit process for groundwater recharge, but groundwater use is typically regulated at a local level. California's 58 counties are responsible for well construction permitting, although well drillers must also report well construction, reconstruction, and destruction to the state. California has managed groundwater under the Sustainable Groundwater Management Act (SGMA) since 2015. While the California Department of Water Resources oversees SGMA implementation, local public entities and Groundwater Sustainability Agencies (GSAs), operating on a basin or subbasin scale manage groundwater use – both withdrawals and recharge - and develop and implement Groundwater Sustainability Plans (GSPs). The GSAs report on groundwater use and include water budgets in their plans. One SGMA management goal is to avoid significant and unreasonable effects on beneficial uses of surface water that is connected to groundwater. Individual basin sustainability goals vary but may include ecological goals such as a sustained fishery (year-round flow, temperature control) where groundwater-dependent ecosystems and interconnected surface and groundwater are present.

Associated Links:

[California SGMA Program Information](#)

[California Groundwater Sustainability Agencies](#)

[Interconnected Surface Water Depletions: The Groundwater Exchange](#)

Florida

Florida is subdivided into five designated water districts that assess the impacts of groundwater withdrawals to aquifers, streams, lakes, wetlands, and springs. The Florida Department of Environmental Protection has general supervisory authority over the state's five water management districts, which are responsible for the administration of the water resources at the regional level. The districts issue Consumptive Use Permits –for water withdrawals. The districts evaluate and protect natural systems through the implementation of a Minimum Flows and Minimum Aquifer Levels program and through reservations of water. The districts also develop water supply plans. The districts have their own taxing ability and also cost-share water supply projects.

Associated Links:

[Florida Statute on Groundwater Management](#)
[Florida Water Management Districts](#)

Iowa

Iowa restricts water withdrawals in watersheds below 50 square miles to 200 gallons per minute for any new well within 1,320 feet of a stream. Iowa has established protected flow designations for streams and withdrawals from wells within 660 feet of a stream are required to cease pumping when streamflows reach this threshold. Iowa has special management for wells in the Cambrian-Ordovician (Jordan) aquifer, withdrawal rates are restricted by water use, and additional restrictions occur at significant aquifer drawdown thresholds. Similarly, Iowa has special regulations for the Dakota aquifer.

Associated Links

[Water Allocation and Use Program](#)
[Iowa Rules on Groundwater Management](#)

Kansas

Kansas has five designated groundwater management districts that are a local level of government designated to oversee their local groundwater use impacts. Within the Kansas Water Appropriation Act and the Groundwater Management District Act, there are management programs available that are: Intensive Groundwater Use Control Areas, Local Enhanced Management Areas, and Water Conservation Areas that provide a more focused, prescriptive approach as part of groundwater management in Kansas.

Associated Links:

[Kansas Groundwater Management Districts](#)

Michigan

Michigan's Department of Environment, Great Lakes, and Energy currently assesses surface water and groundwater withdrawals to streams on a stream reach (sub-watershed) basis. Michigan has established an allowable depletion for each stream reach. Any proposed surface water and groundwater withdrawals are evaluated together with existing withdrawals approved since 2008 to determine if the depletion meets the Michigan's definition of an adverse resource impact. Michigan's adverse resource impact definition also includes impacts to inland lakes from direct surface water withdrawals but not from groundwater withdrawals. New or increased large quantity withdrawals > 2 MGD require a permit. The permit decision making standards include determining that the proposed withdrawal is a reasonable use under common law, is in compliance with the Great Lakes Compact, and is not likely to cause an adverse resource impact. Michigan also has a separate aquifer dispute resolution statute that addresses interference with private wells from high-capacity wells.

Associated Links:

[Michigan Statute on Groundwater Management](#)
[Michigan Water Use Program](#)

Minnesota

Minnesota's Department of Natural Resources currently assesses groundwater withdrawal impacts to all waters of the state (lakes, ponds, wetlands, rivers, streams, ditches, springs and waters from underground aquifers) regardless of their size or location on a case-by-case basis by determining if the proposed high capacity well would have a significant adverse impact on the resource or well. Additionally, permitting staff review proposals while considering whether other high capacity users may be impacting each other, domestic water supplies, the aquifer or natural resources in the area. In areas of conflict between water resources and water use, Minnesota has established three groundwater management areas throughout the state and have established recommended thresholds for lakes, streams and wetlands. In the 2010's, Minnesota and their project partners examined the impact of groundwater withdrawals on White Bear Lake, located within the Twin Cities Metro Area. The Minnesota DNR manages groundwater quantity throughout the state, including coordination with local water plans when available.

Associated Links:

[Minnesota Statute on Groundwater Management](#)

[Minnesota Groundwater Management Areas](#)

[White Bear Lake Groundwater Management](#)

Nebraska

Nebraska is subdivided into 23 Natural Resource Districts (NRDs). One NRD function is to assess and manage groundwater withdrawal impacts to streams with a goal of avoiding fully appropriated or over appropriated basins. For streams, allowed appropriations are defined by legal minimum flow agreements, existing surface water rights, and, in a few cases, environmental impacts. While the Nebraska Department of Natural Resources (DNR) has general supervisory authority over the state's surface water, the locally elected governing boards of the NRDs enact groundwater quantity rules and regulations, implement Groundwater Management Plans, approve well permits, and enact levy power to fund groundwater management and programs. The Nebraska Legislature has established a collaborative state and local process that recognizes the inter-connectivity of groundwater and surface water. The process involves local NRDs partnering with the Nebraska DNR to develop and implement Integrated Management Plans for the protection of hydrologically connected water supplies.

Associated Links:

[Nebraska Water Use Regulation Overview](#)

[Nebraska Natural Resource Districts](#)

[Nebraska Groundwater Quantity Regulation Map](#)

Wisconsin

Wisconsin's Department of Natural Resources currently evaluates high capacity well applications on a case-by-case basis by determining whether the proposed high capacity well together with existing environmental impacts would have a significant adverse impact on any navigable water bodies, springs greater than or equal to 1 cfs and public water supply wells. High capacity well owners in Wisconsin are issued approvals and their approvals are not managed as part of a larger area (watershed, district, etc.). Any high capacity well approval may be conditioned to avoid significant impact to the specified water resources. Wisconsin utilizes a set of management tools including water use reporting.

Table 1: Overview of Regulatory Approaches within 8 US States

	Surface water resources evaluated relative to groundwater withdrawals	Authority to manage groundwater withdrawals with respect their cumulative impact to surface water?	Management Scale	Management Authority	Additional Oversight
California	Surface waters connected to groundwater	Yes (statewide)	Groundwater Sustainability Agencies (Groundwater basin/subbasin scale)	Local, State	
Florida	<ul style="list-style-type: none"> • Streams • Lakes • Wetlands • Springs 	Yes (designated areas)	Water Management Districts	State, Regional	
Iowa	<ul style="list-style-type: none"> • Streams 	Yes (designated areas)	Watersheds, Aquifer	State	
Kansas	<ul style="list-style-type: none"> • Streams • Lakes • Wetlands • Springs 	Yes (designated areas)	Groundwater Mgt. Districts <ul style="list-style-type: none"> • Intensive Groundwater Use Control Areas • Local Enhanced Mgt. Areas • Water Conservation Areas 	State, Local	
Michigan	<ul style="list-style-type: none"> • Streams • Lakes (> 5 acres) 	Yes (statewide)	Subwatersheds	State	Water Use Advisory Council
Minnesota	<ul style="list-style-type: none"> • Streams • Lakes • Wetlands 	Yes (statewide)	<ul style="list-style-type: none"> • Per Application (outside of Groundwater Mgt. Areas) • Groundwater Mgt. Areas 	State	Appointed Advisory Team in Groundwater Mgt. Areas
Nebraska	<ul style="list-style-type: none"> • Streams 	Yes (statewide)	Natural Resources Districts, sub-areas	State, Local	
Wisconsin	<ul style="list-style-type: none"> • Streams • Lakes • Springs 	Yes (statewide)	<ul style="list-style-type: none"> • Per Application 	State	

Table 2: Implementation tools used to manage groundwater withdrawals within 8 US States

	Limits on wells or irrigated acreage	Permitting Renewal System for wells	Metering of Wells	Water Use Reporting	Water Use Mgt. Plans & Goal Setting	Fees, Taxes, Levy	Monitoring	Land Retirements	Water Markets
California	•		•	•	•	•	•	•	•
Florida	•	•	•*	•	•	•	•		
Iowa		•	•	•		•			
Kansas	•	•	•	•	•	•	•	•	•
Michigan	•	•		•		•	•		
Minnesota		•	•	•	•	•	•		
Nebraska	•		•	•	•	•	•	•	•
Wisconsin			•	•		•			

*Some Water Management Districts require meters