



# Southeastern Wisconsin Regional Water Supply Plan

Commission Quarterly Meeting

September 15, 2010



# Background

A Cooperative Program...

SE Wisconsin  
Water Utilities



Seven Southeastern  
Wisconsin Counties





## Background

# Regional Water Supply Planning Program

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### Three Elements (Coordinated With And Designed To Complement Local Actions)

1. Conduct Basic Groundwater Inventories (Completed in 2001 With Partners—WGNHS and WDNR)
2. Collect Additional Inventory Data and Develop Regional Aquifer Simulation Model (Completed in 2005 with Partners—USGS, WGNHS, UW-Milwaukee, WDNR, and SE Wisconsin Water Utilities)
3. Prepare Regional Water Supply System Plan (Partners Include USGS, WGNHS, UW-Milwaukee, and WDNR)



## Regional Water Supply Plan Reports

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- Technical Report No. 43, “State of the Art of Water Supply Practices”
  - Published
- Technical Report No. 44, “Water Supply Law Report”
  - Published
- Technical Report No. 46, “Groundwater Budget Indices and Their Use in Assessing Water Supply Plans for Southeastern Wisconsin”
  - Published



## Regional Water Supply Plan Reports—continued

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- Technical Report No. 47, “Groundwater Recharge in Southeastern Wisconsin Estimated by a GIS-Based Water Balance Model”
  - Published
- Technical Report No. 48, “Shallow Groundwater Sustainability Analysis Demonstration for the Southeastern Wisconsin Region”
  - Published
- Planning Report No. 52, “A Regional Water Supply Plan for Southeastern Wisconsin”
  - To be published December 2010



# Regional Water Supply Plan

## List of Chapters

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- Chapter I - Introduction and Background
- Chapter II - Description of the Study Area
- Chapter III - Existing Water Supply Conditions in the Region
- Chapter IV - Anticipated Growth and Change Affecting Water Supply in the Region
- Chapter V - Planning Objectives, Principles, and Standards
- Chapter VI - Summary of Water Supply Law as Applied to Southeastern Wisconsin
- Chapter VII - Water Supply Problems Identification and Issues to be Addressed
- Chapter VIII - Alternative Plans: Description and Evaluation
- Chapter IX – Alternative Plan Comparative Evaluation and Selection of a Composite Plan for Further Consideration
- Chapter X - Recommended Water Supply System Plan
- Chapter XI - Plan Implementation
- Chapter XII - Summary and Conclusions



# Regional Water Supply Planning Advisory Committee

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# Background

**Objective – To assess whether the water supply for this Region can sustain existing and planned population and development.**

## Experience to Date

### ➤ Current water supply (290 mgd)




- Lake Michigan – 9 plants (28 systems) serving 1.2 million people (210 mgd-72%)
- Groundwater – 50 systems serving 400,000 people (55 mgd-19%)
- Groundwater – individual wells serving 350,000 people (25 mgd-9%)

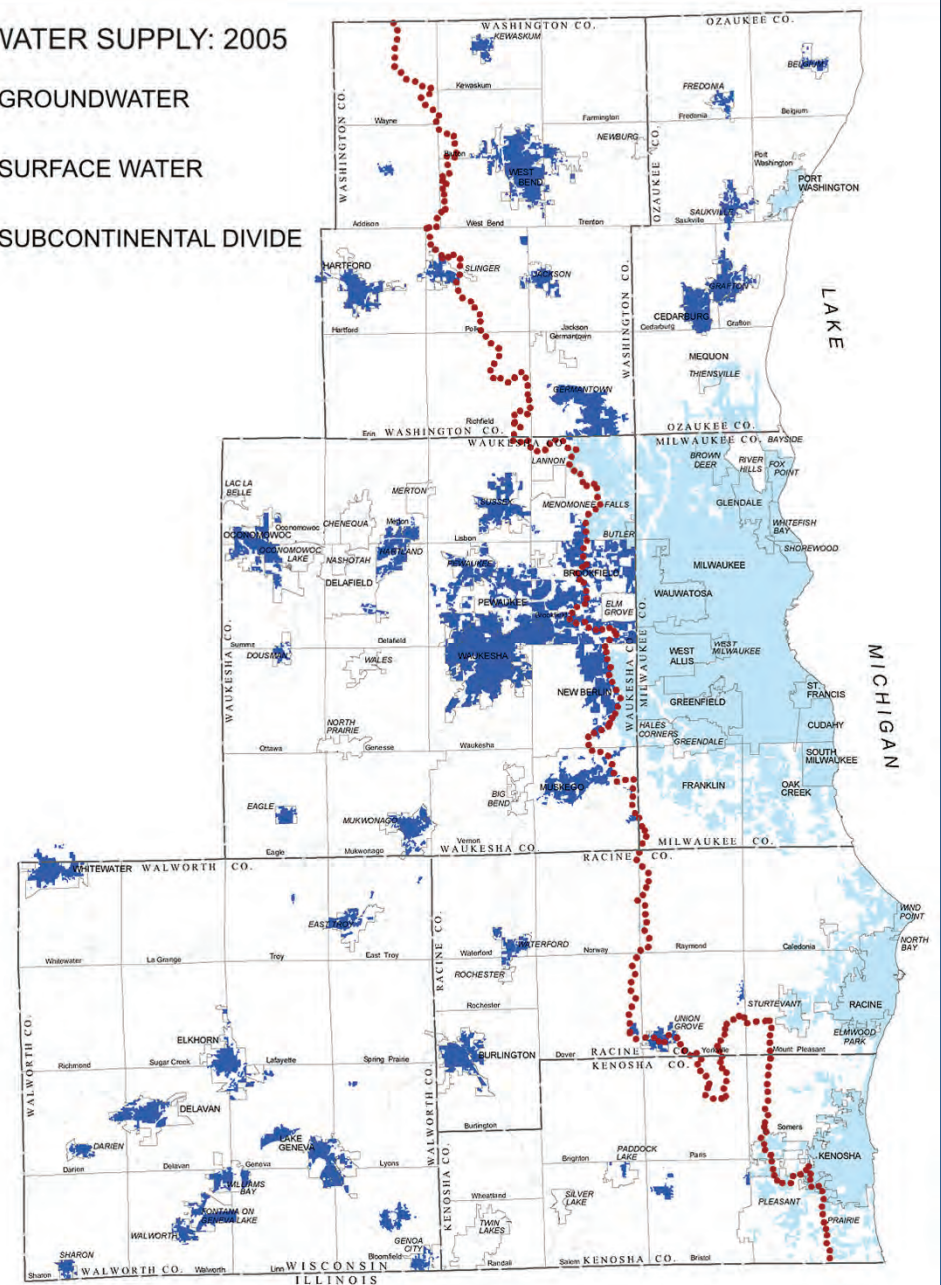
➤ Groundwater deep aquifer – historic 4 to 5 feet annual drawdown and some radium and dissolved solids problems.

➤ Groundwater shallow aquifer – some isolated seasonal supply problems and quality issues.

➤ Lake Michigan water – existing treatment plants operating at less than 50 percent of capacity.

PUBLIC WATER SUPPLY: 2005

-  GROUNDWATER
-  SURFACE WATER
-  SUBCONTINENTAL DIVIDE



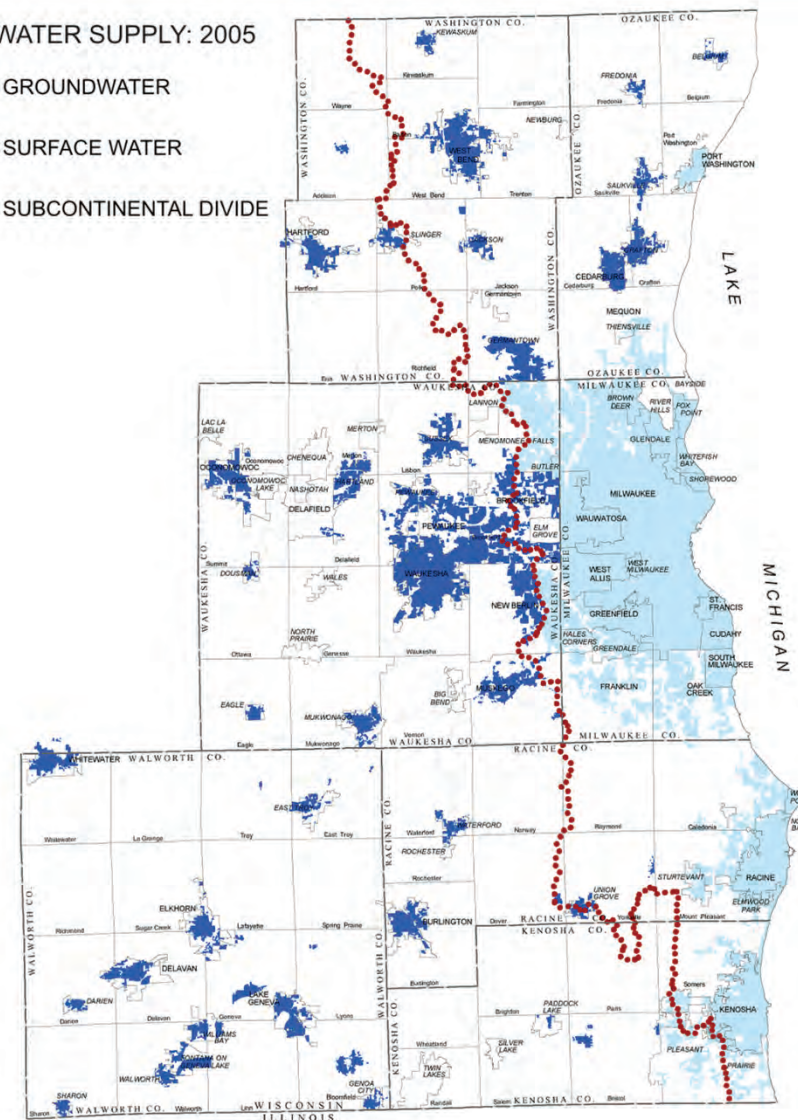
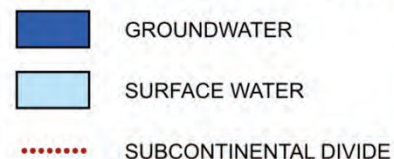


# Background—continued

## Scope of Study

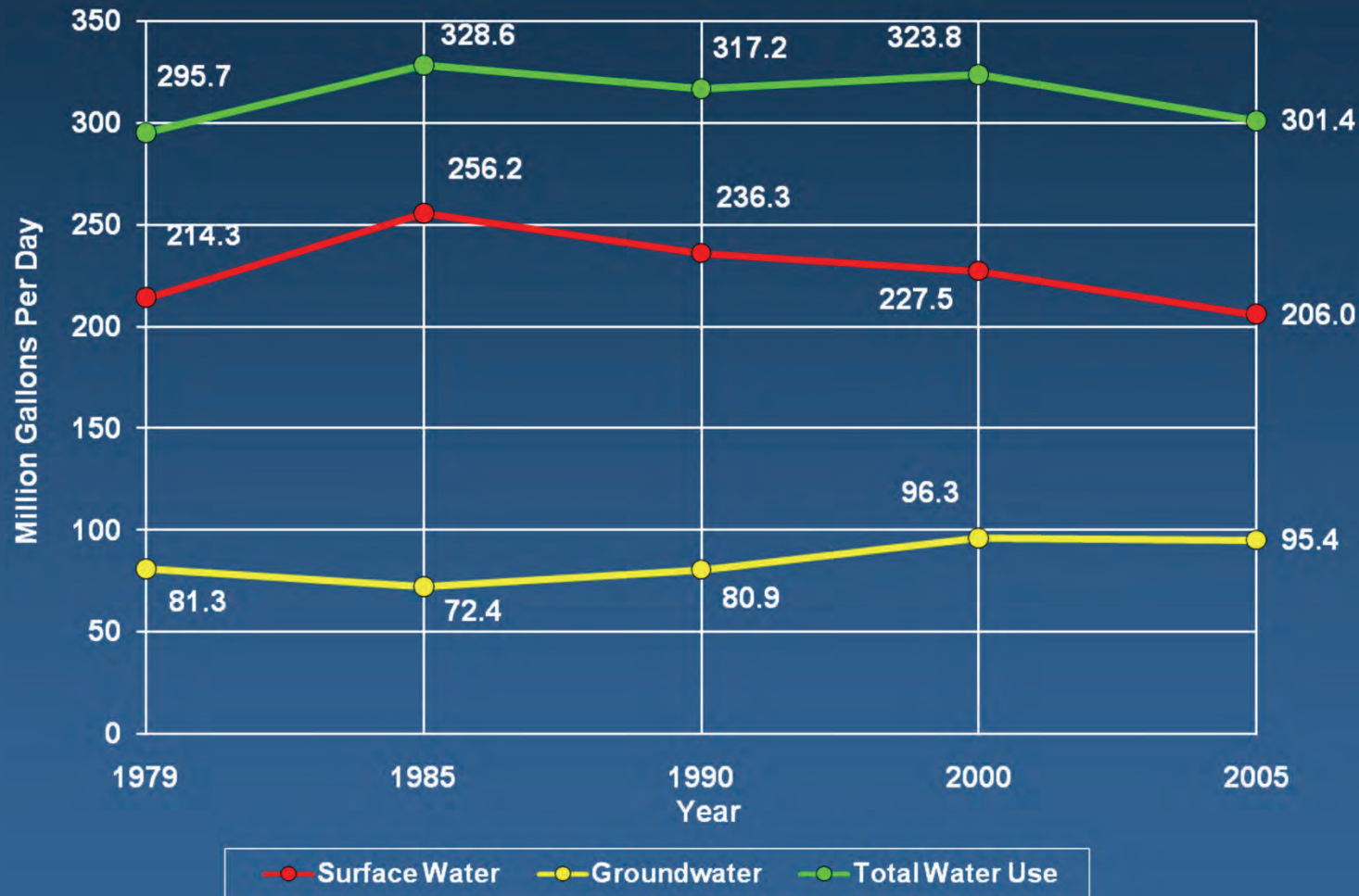
- Forecast future water use demand in the Region.
- Consider potential of water conservation to reduce future demand.
- Identify groundwater recharge areas which should be protected from development.
- Assess potential for shallow groundwater recharge through infiltration of stormwater runoff and treatment plant effluent.
- Consider potential alternative sources of supply
  - Shallow groundwater
  - Lake Michigan water replacing groundwater east of the subcontinental divide.
  - Lake Michigan water replacing groundwater in “straddling communities” which already have “return flow”
  - Lake Michigan water replacing groundwater in “straddling communities” and “communities in straddling counties” and providing for “return flow”.
- Estimate costs and impacts of alternatives
  - Groundwater-Surface Water Interdependence and Impacts
- Identify any development constraints necessary to assure water supply sustainability; consider amending regional land use plan if necessary

PUBLIC WATER SUPPLY: 2005



## Background

### Trends in Water Use for the Region: 1979-2005 (in Million Gallons Per Day)\*

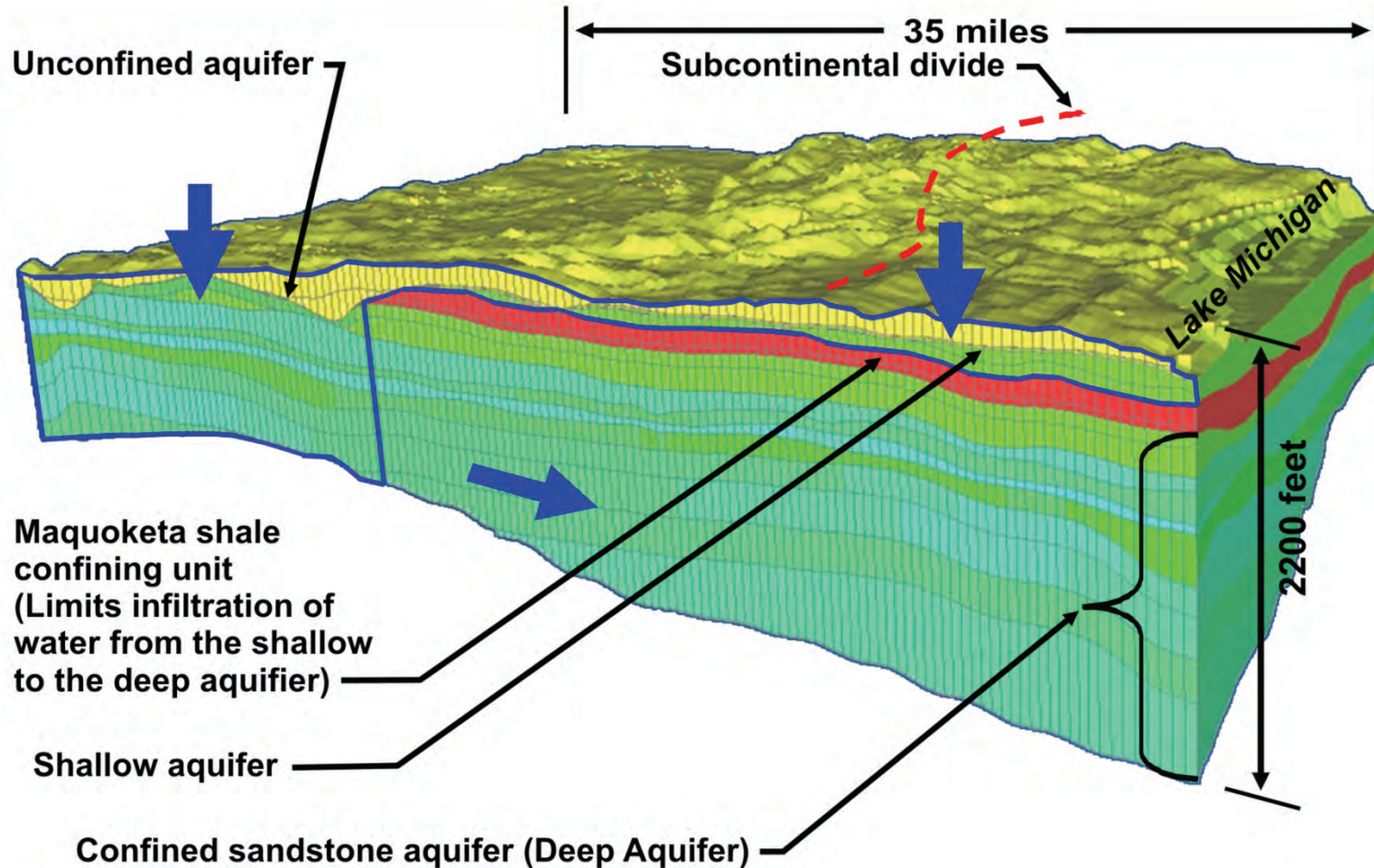


Source: USGS

\* Excludes thermoelectric power generation uses

# Background

## General Hydrogeology of Southeast Wisconsin



Private residential wells are generally in the shallow aquifer and 100 to 300 feet deep. Most municipal wells are 200 to 800 feet deep with some up to 2,200 feet deep, and are in both the shallow and deep aquifer.

Source: USGS.

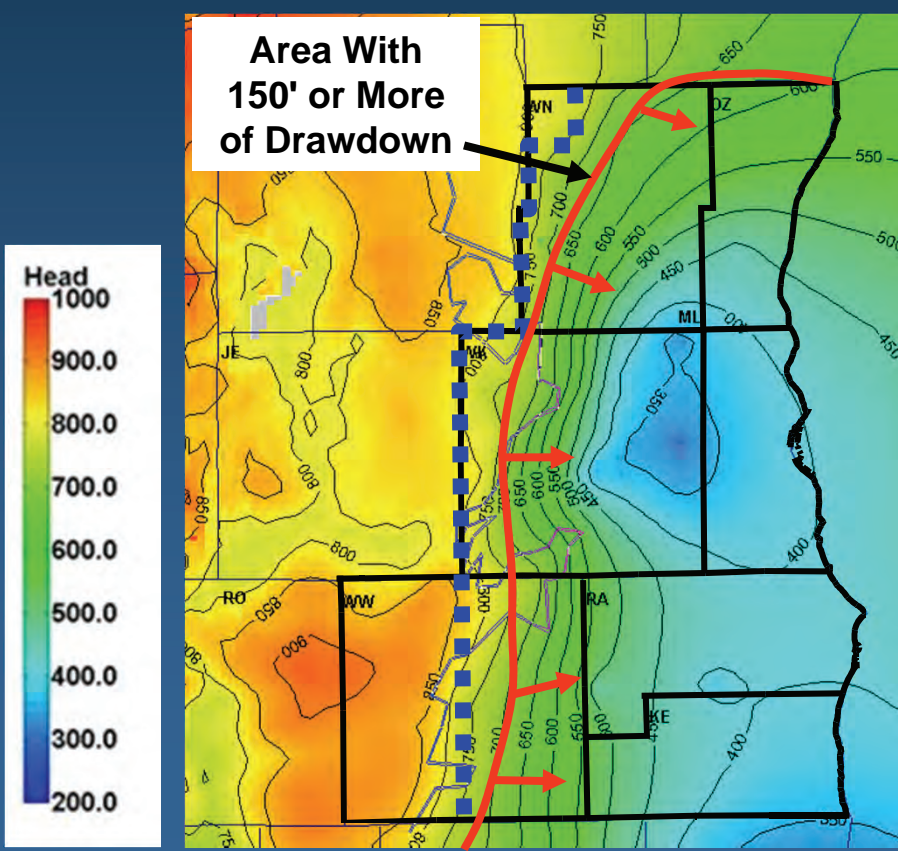
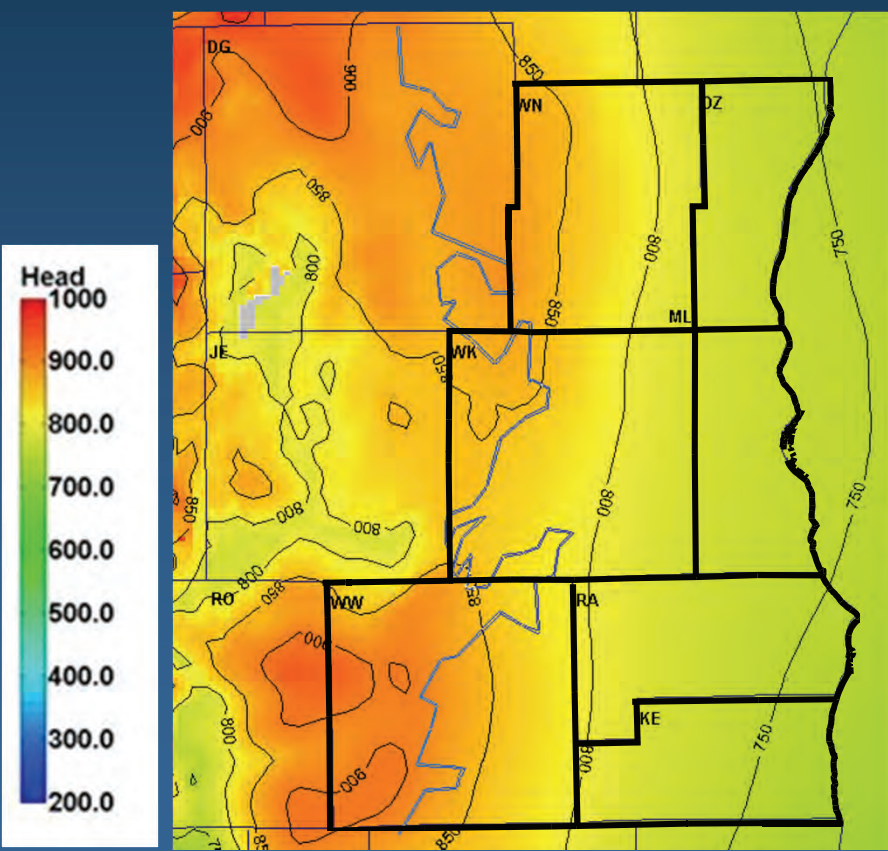


# Background

## Deep Sandstone Aquifer Drawdown

Pre-1864

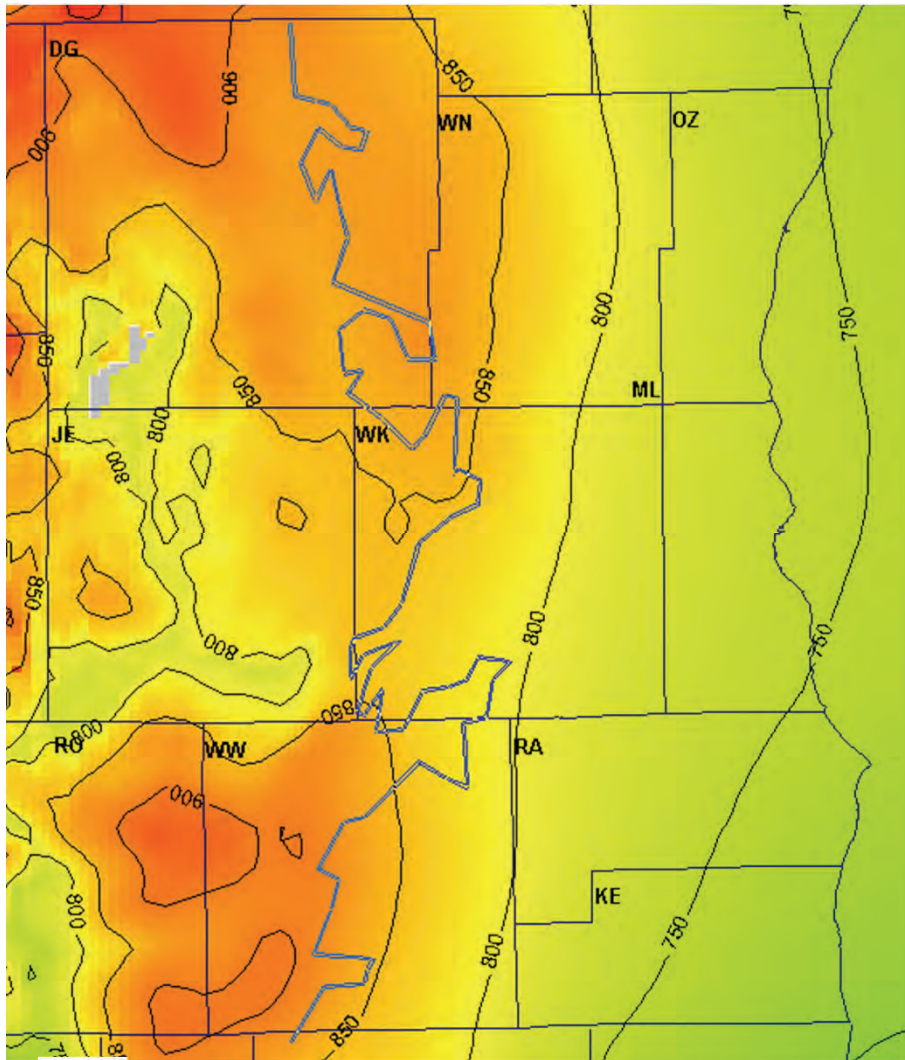
2000



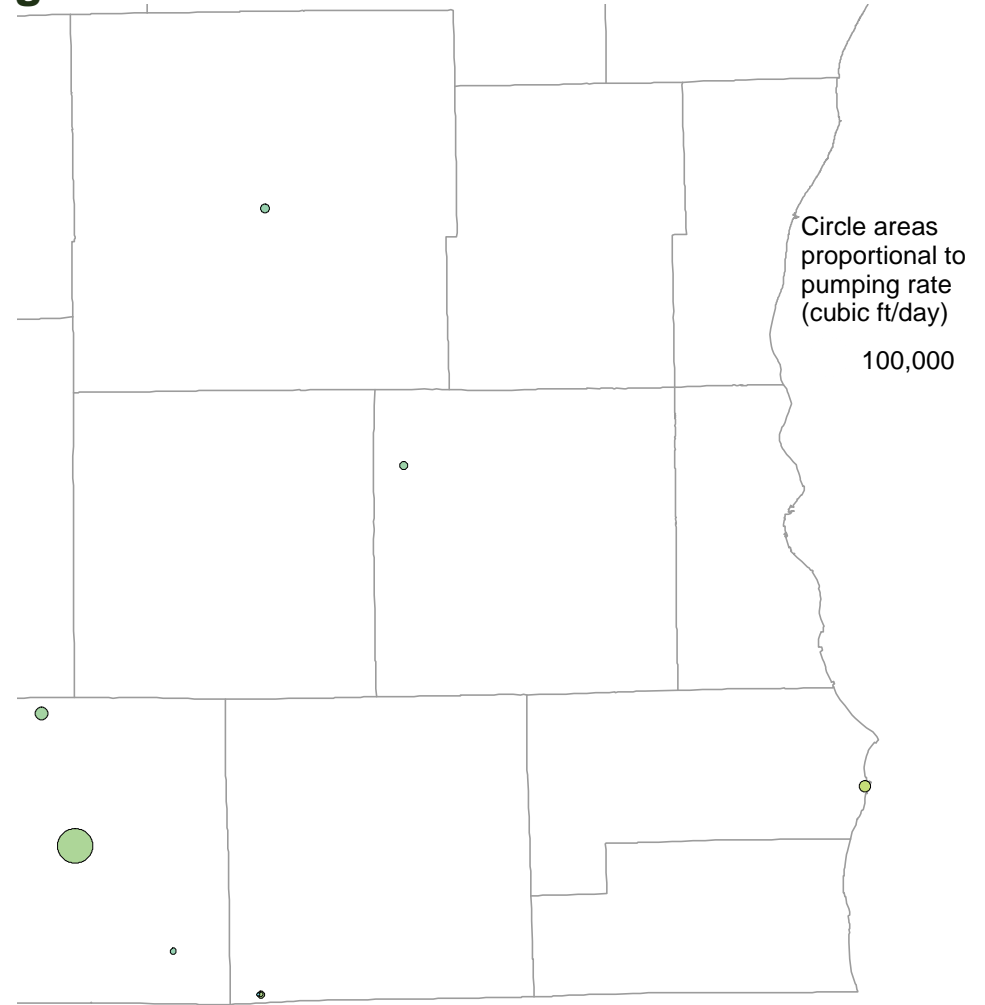
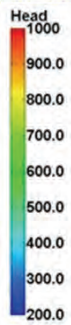
Water Levels in the Sandstone Aquifer (feet above sea level)

Water Levels in the Sandstone Aquifer (feet above sea level)

# Background



Water Levels in the Sandstone Aquifer  
(feet above sea level)

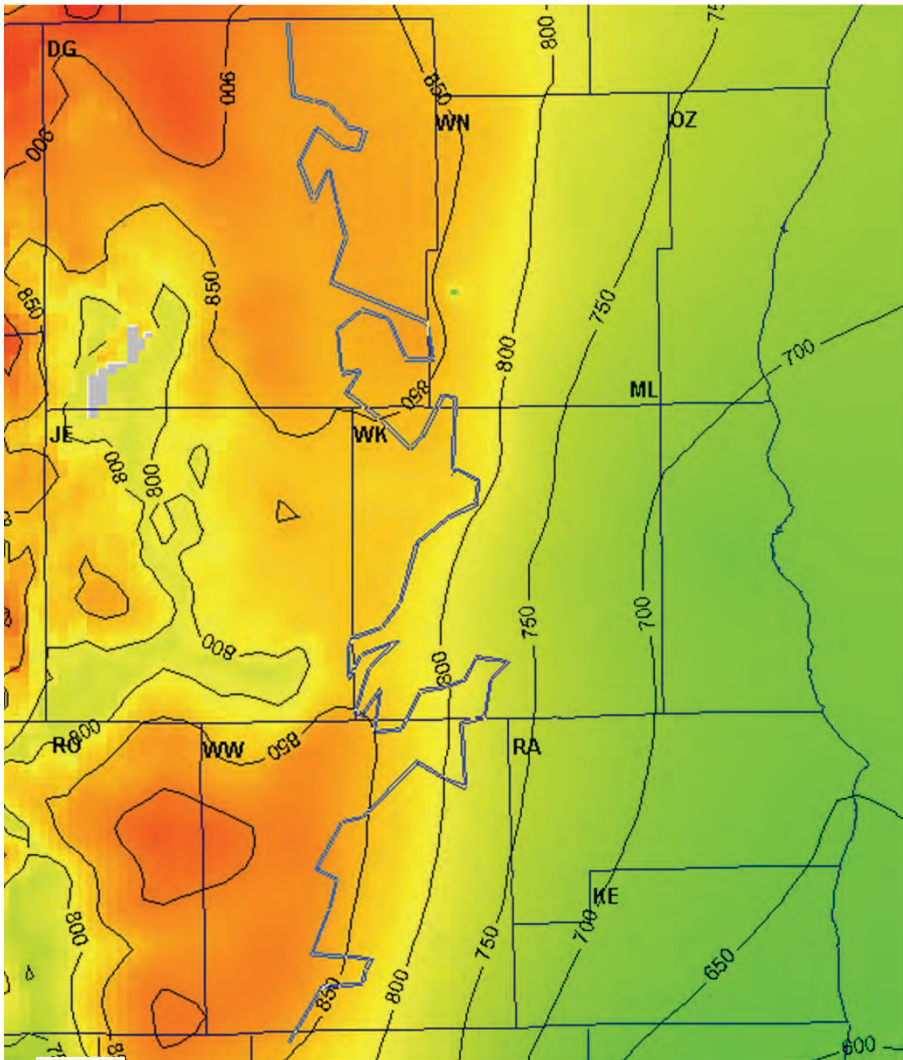


Well Locations and Pumping Rates

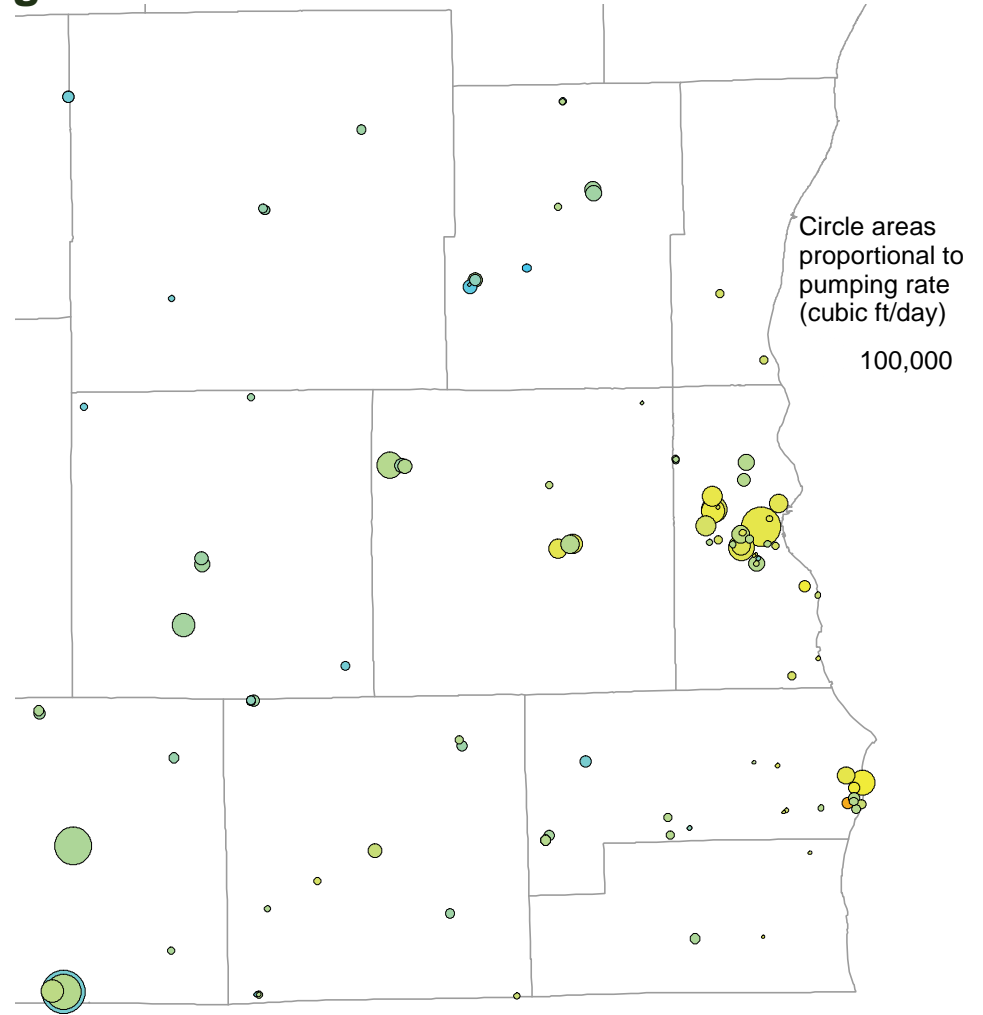
- Shallow
- Mixed or Intermediate Depth
- Deep

1880-1900

# Background



Water Levels in the Sandstone Aquifer  
(feet above sea level)

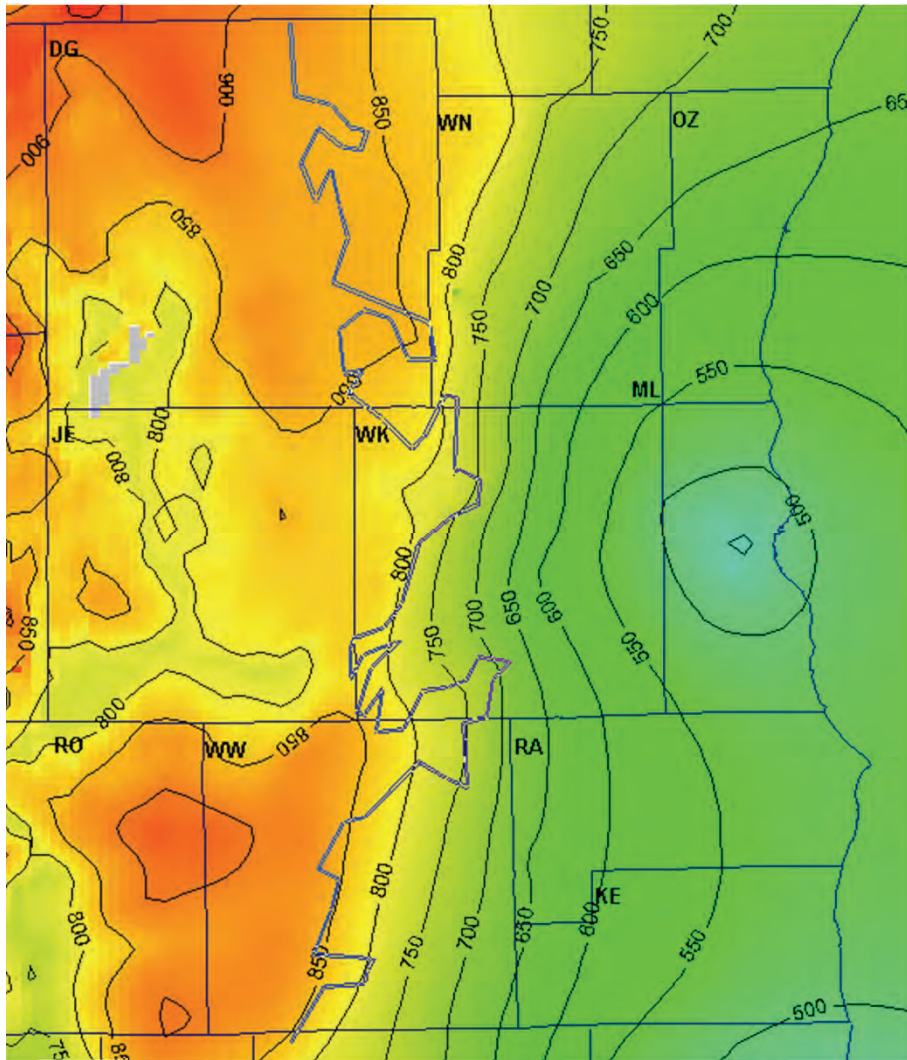


Well Locations and Pumping Rates

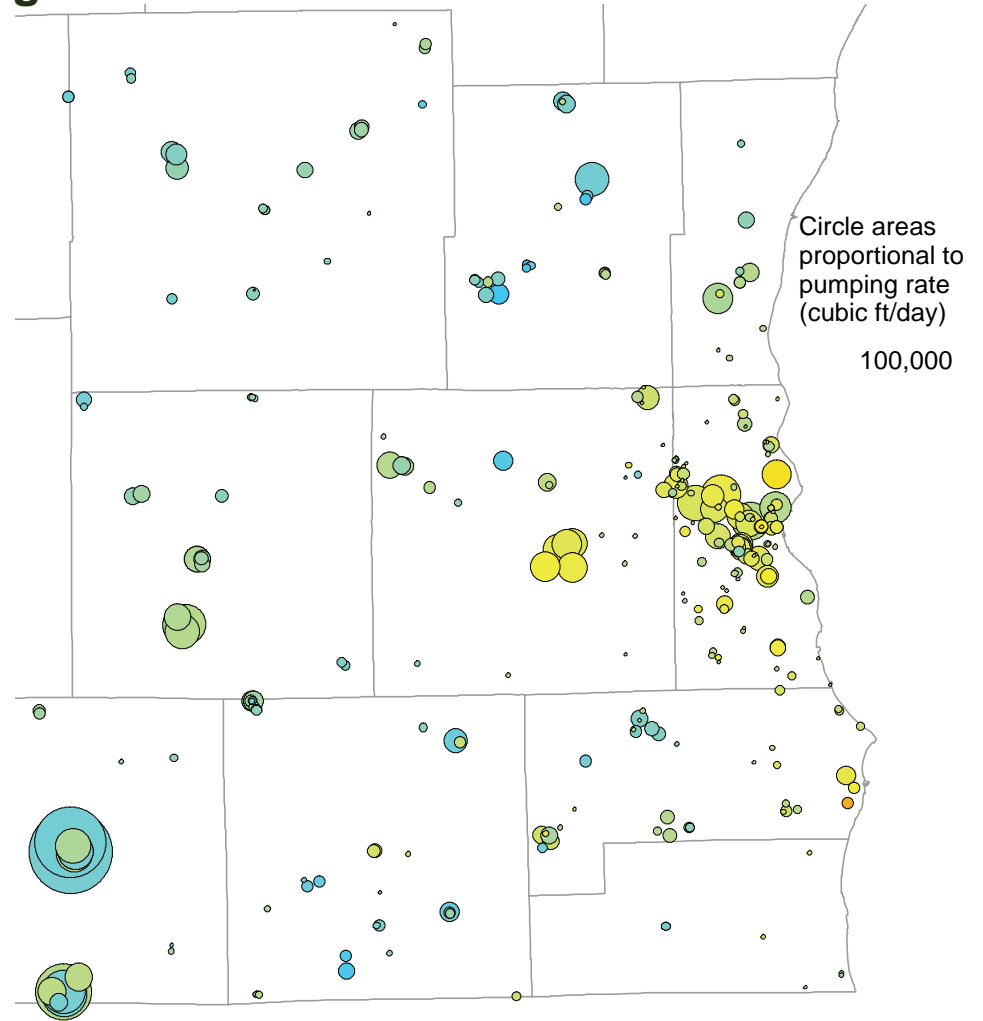
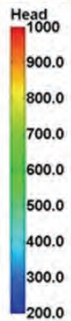
- Shallow
- Mixed or Intermediate Depth
- Deep

1920-1930

# Background



Water Levels in the Sandstone Aquifer  
(feet above sea level)

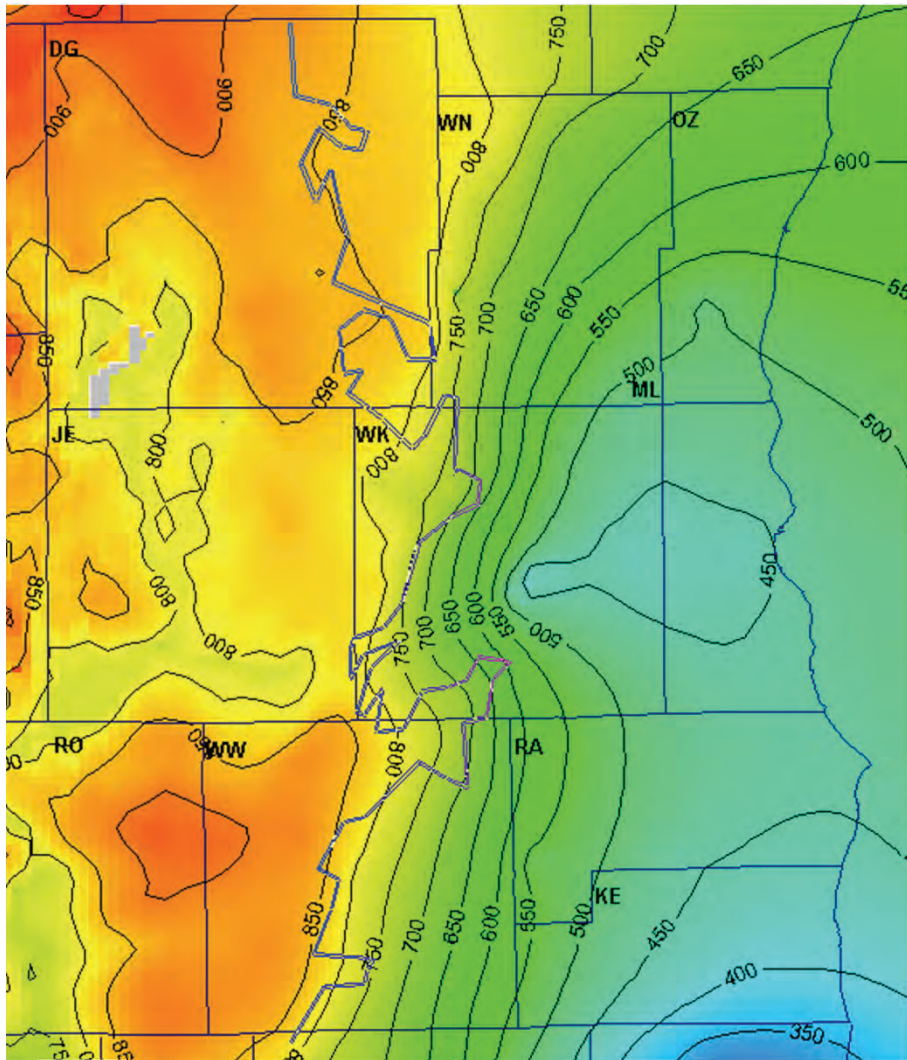


Well Locations and Pumping Rates

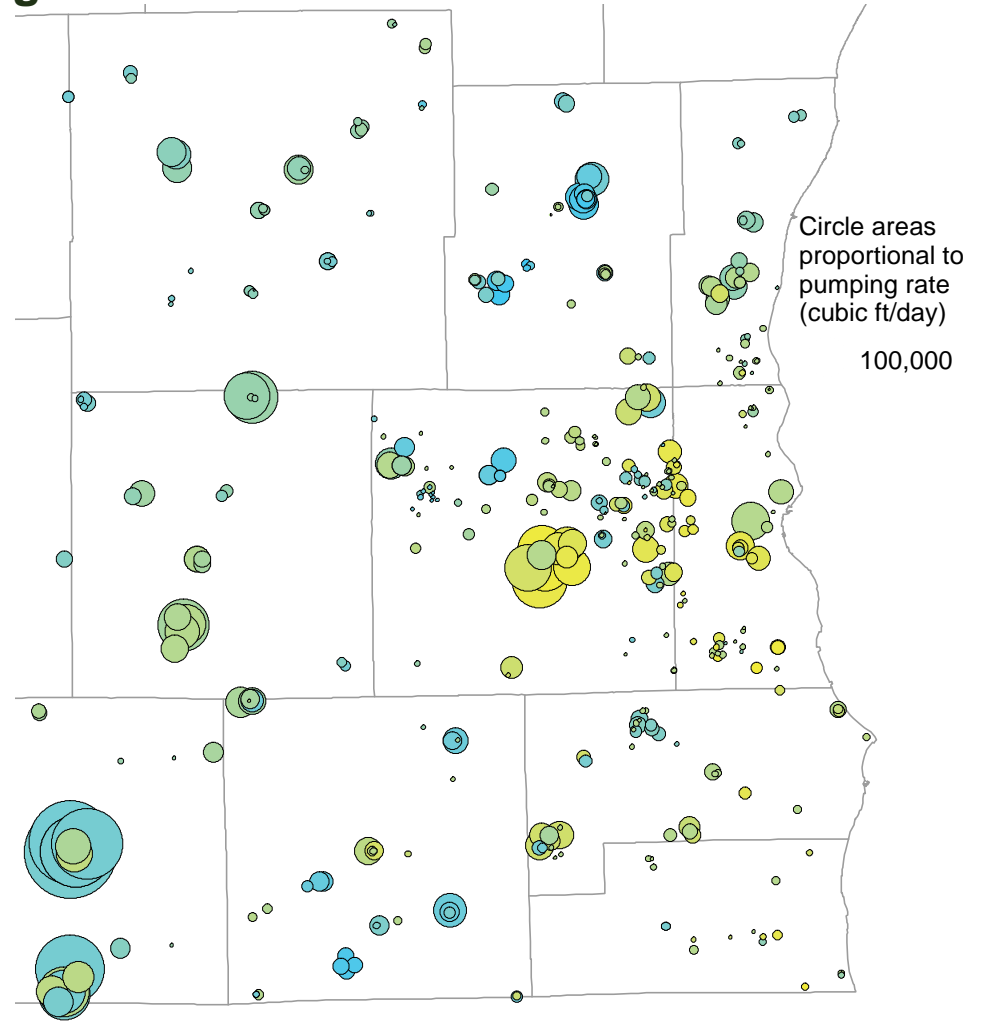
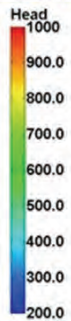
- Shallow
- Mixed or Intermediate Depth
- Deep

1950-1961

# Background



Water Levels in the Sandstone Aquifer  
(feet above sea level)



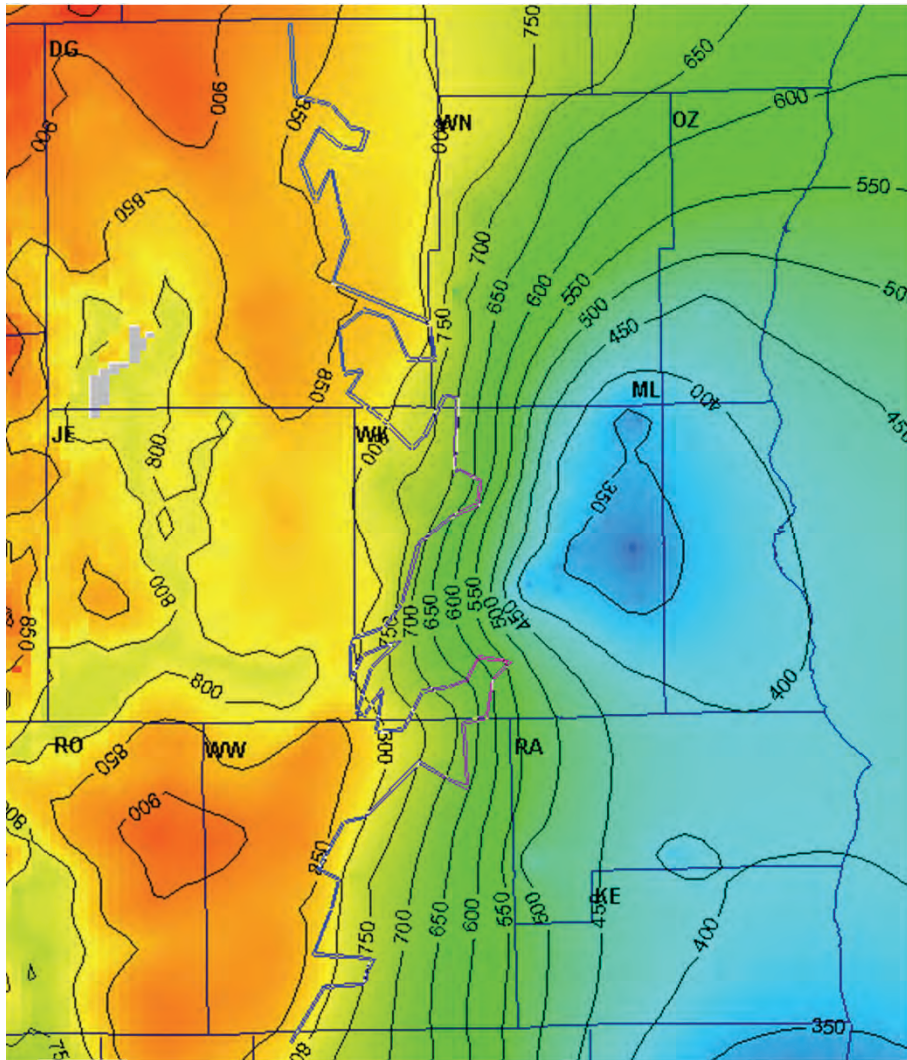
Well Locations and Pumping Rates

- Shallow
- Mixed or Intermediate Depth
- Deep

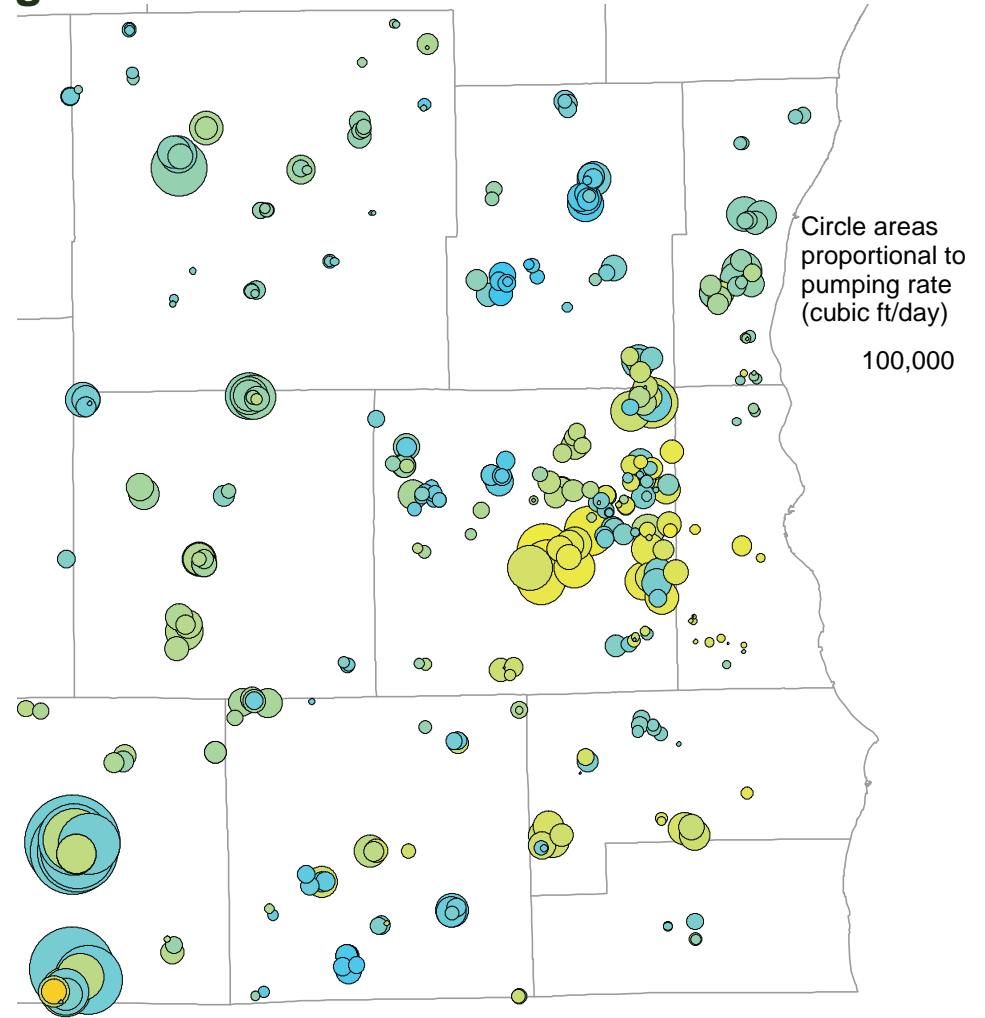
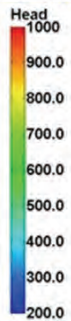
1970-1980



# Background



Water Levels in the Sandstone Aquifer  
(feet above sea level)



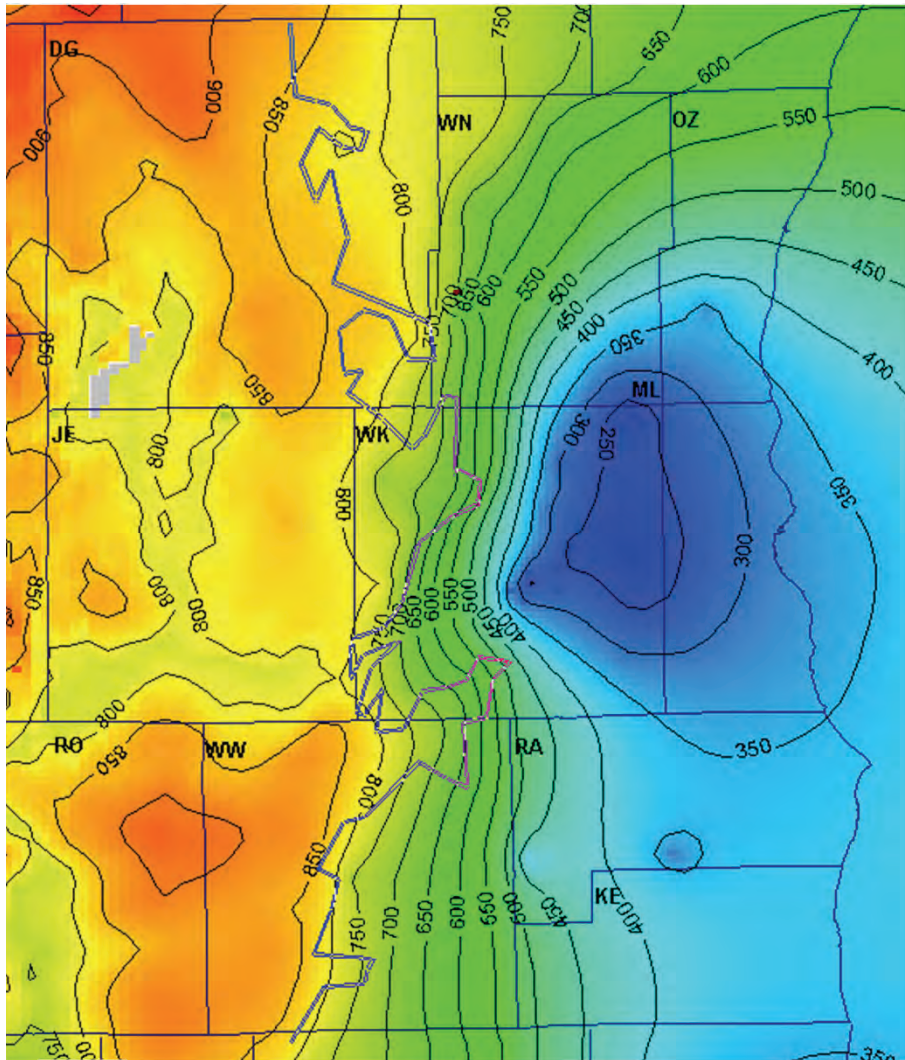
Circle areas  
proportional to  
pumping rate  
(cubic ft/day)  
100,000

Well Locations and Pumping Rates

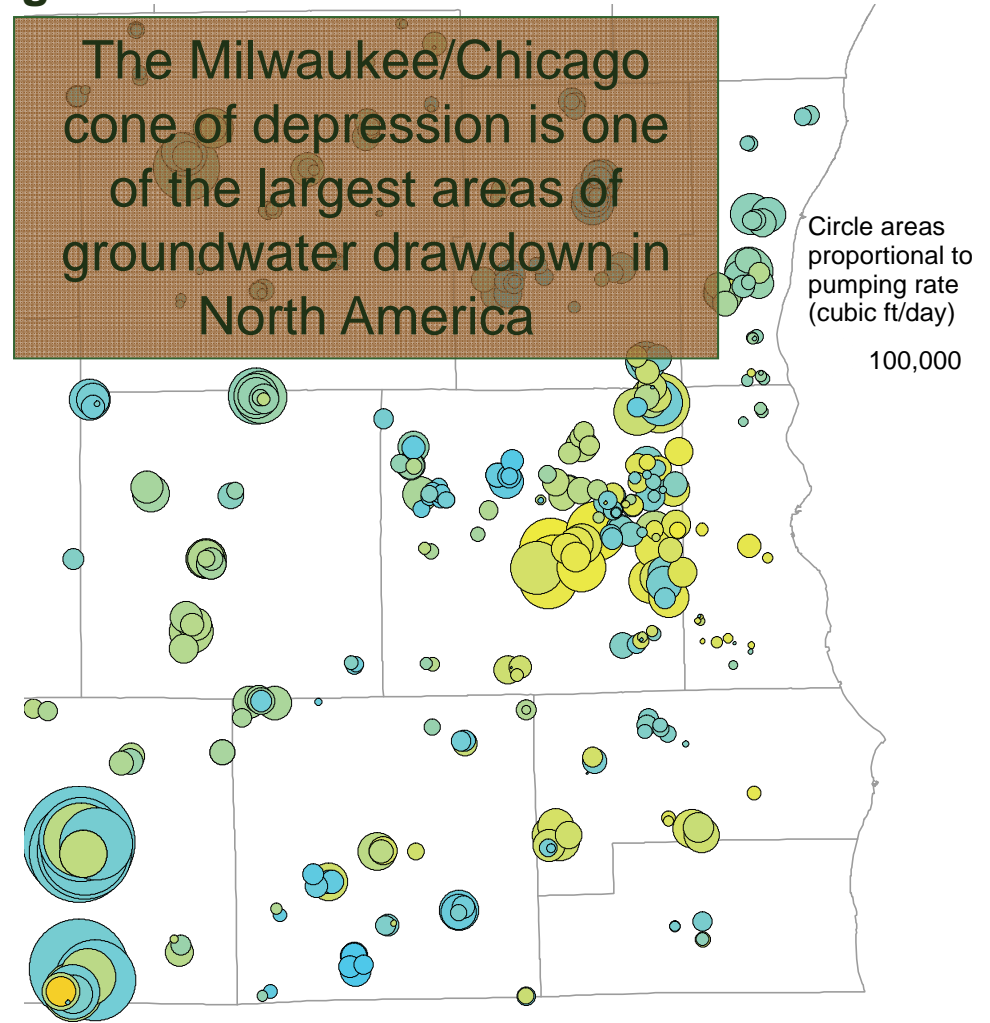
- Shallow
- Mixed or Intermediate Depth
- Deep

1990-2000

# Background



Water Levels in the Sandstone Aquifer  
(feet above sea level)



Well Locations and Pumping Rates

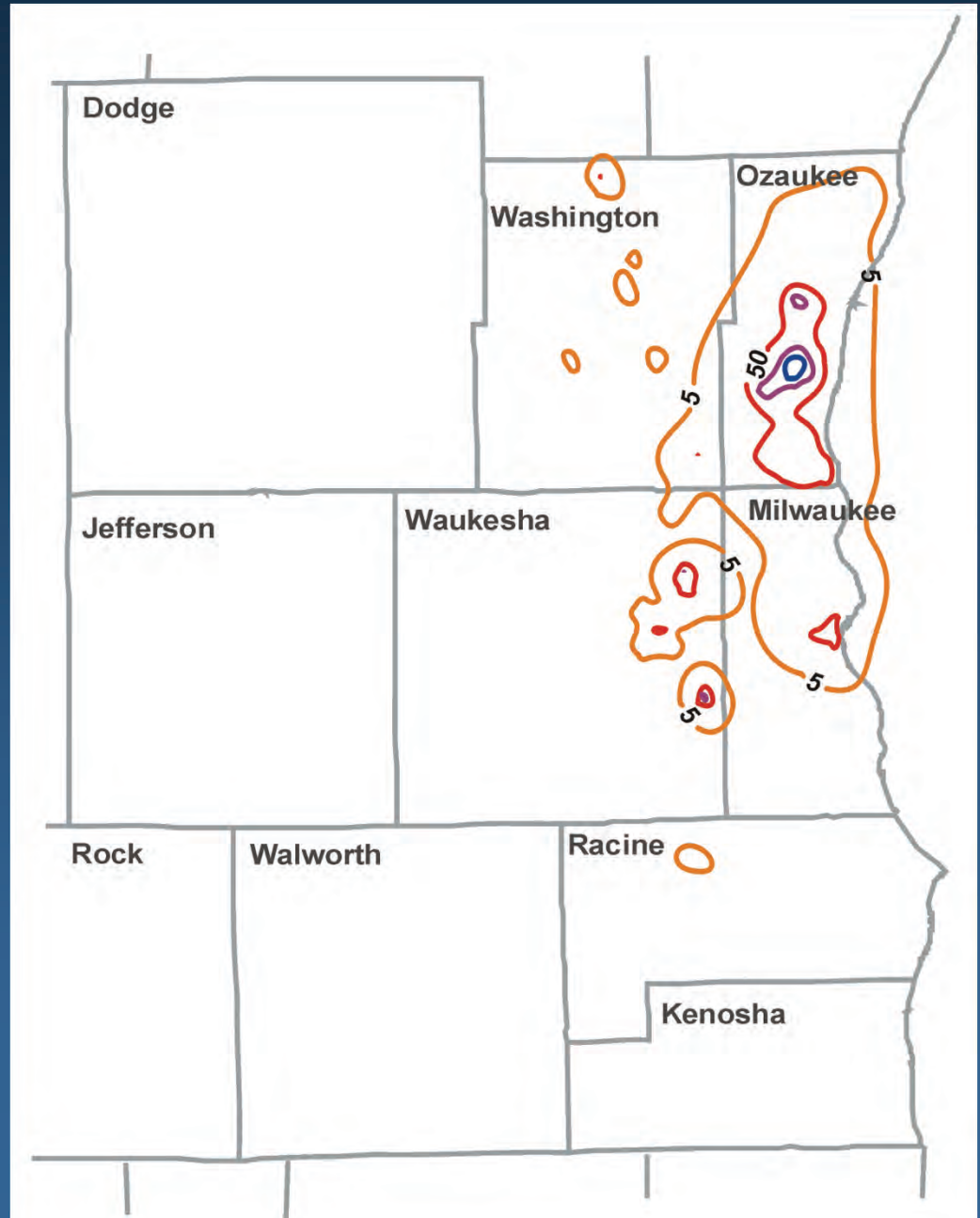
- Shallow
- Mixed or Intermediate Depth
- Deep

2010-2020

# Background

**Simulated Shallow  
Drawdown Relative to  
Predevelopment Conditions:  
Silurian Dolomite in 2000**

Drawdown in Feet





## Background

- **All Groundwater Use Has Consequences – Most (80%) well pumpage is water transferred from the local surface water system**
- **Balancing Groundwater Water Supply Needs With Surface Water Impacts (Reasonableness) is an Important Part of Alternative Plan Development and Evaluation**





## Elements Considered in Alternative Plans

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- Water conservation.
- Groundwater recharge area protection.
- Enhanced recharge of shallow aquifer by stormwater management practices.
- Enhanced recharge of shallow aquifer by injection of highly treated sewage treatment plant effluent.
- Recharge of the deep aquifer by injection of treated Lake Michigan surface water
- Continued reliance on deep aquifer water with treatment as needed.
- Continued and increased reliance on shallow aquifer water.

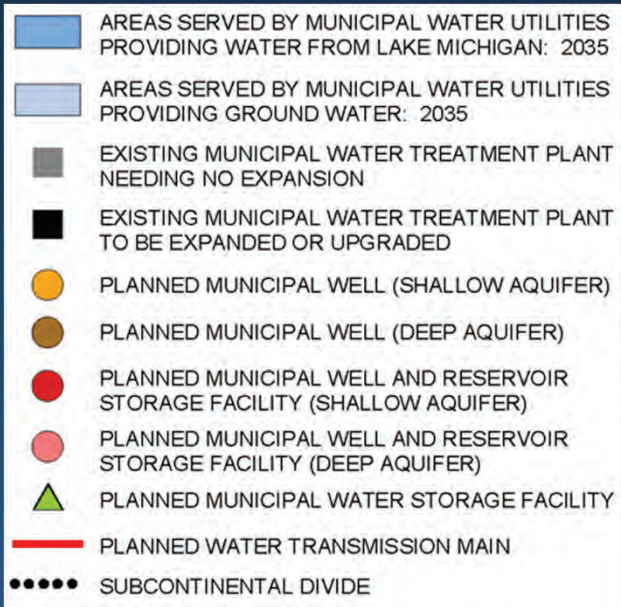


## Elements Considered in Alternative Plans—continued

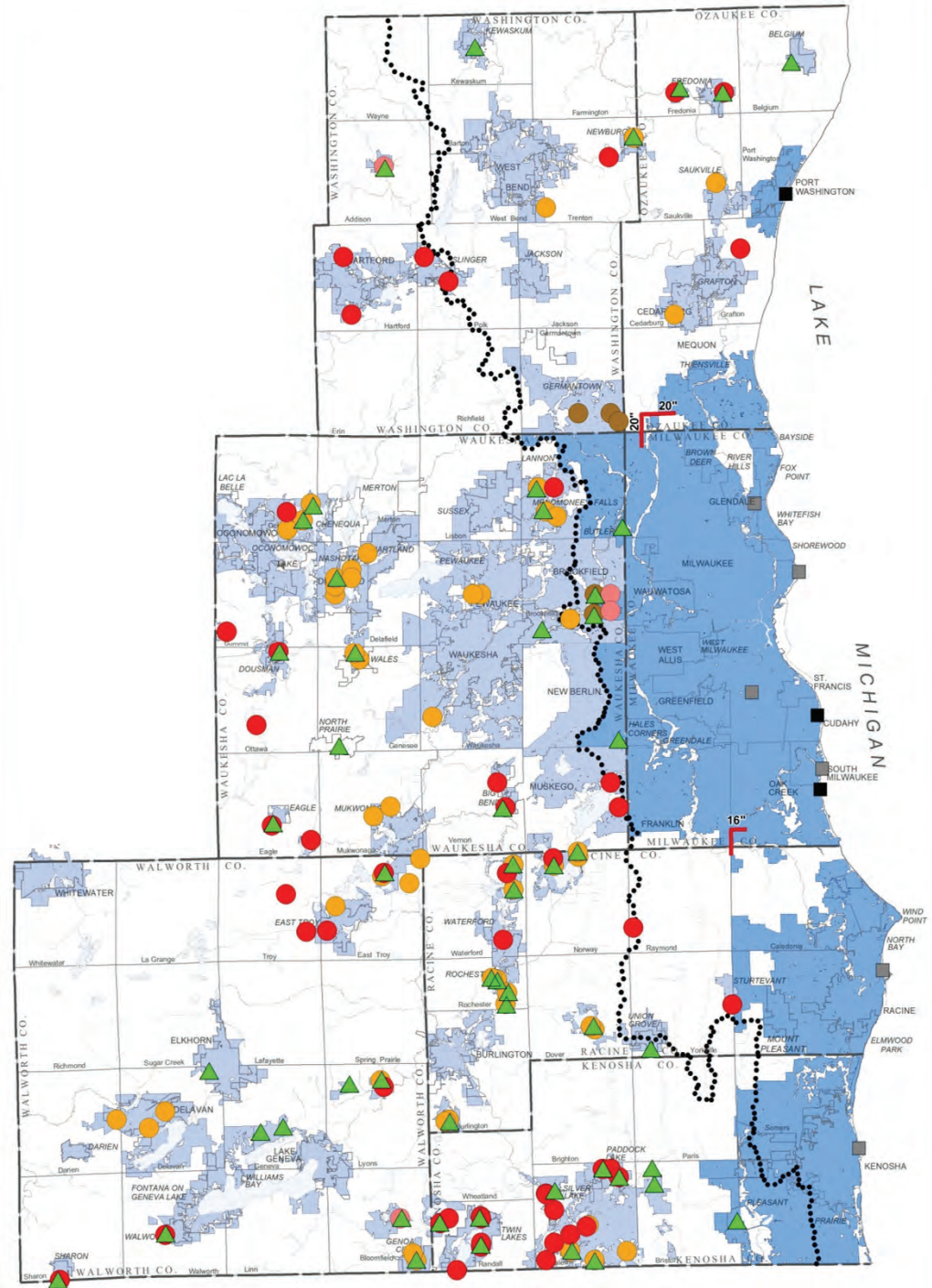
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- Extension of Lake Michigan supply to selected communities east of the divide.
- Extension of Lake Michigan supply to selected communities straddling the divide with current return flow.
- Extension of Lake Michigan supply to areas west of the divide.

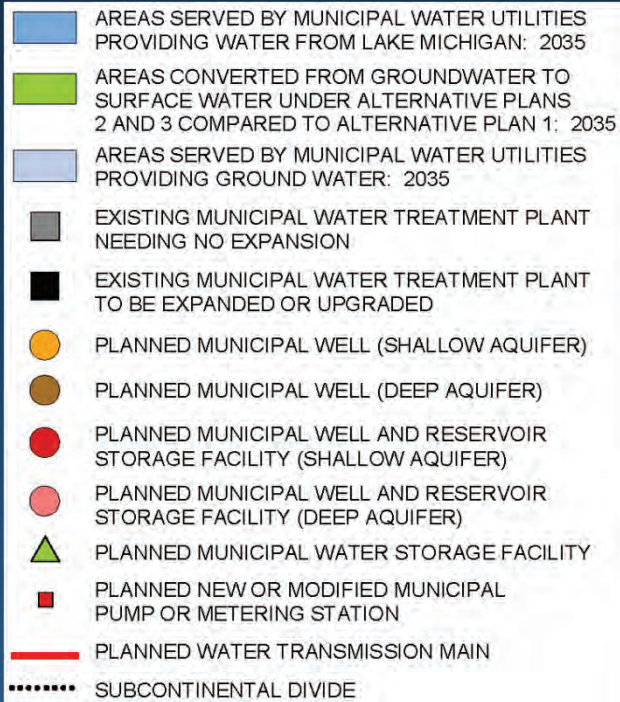
# Regional Water Supply Plan Alternative Plan 1—Design Year 2035 Forecast Conditions Under Existing Trends and Committed Actions



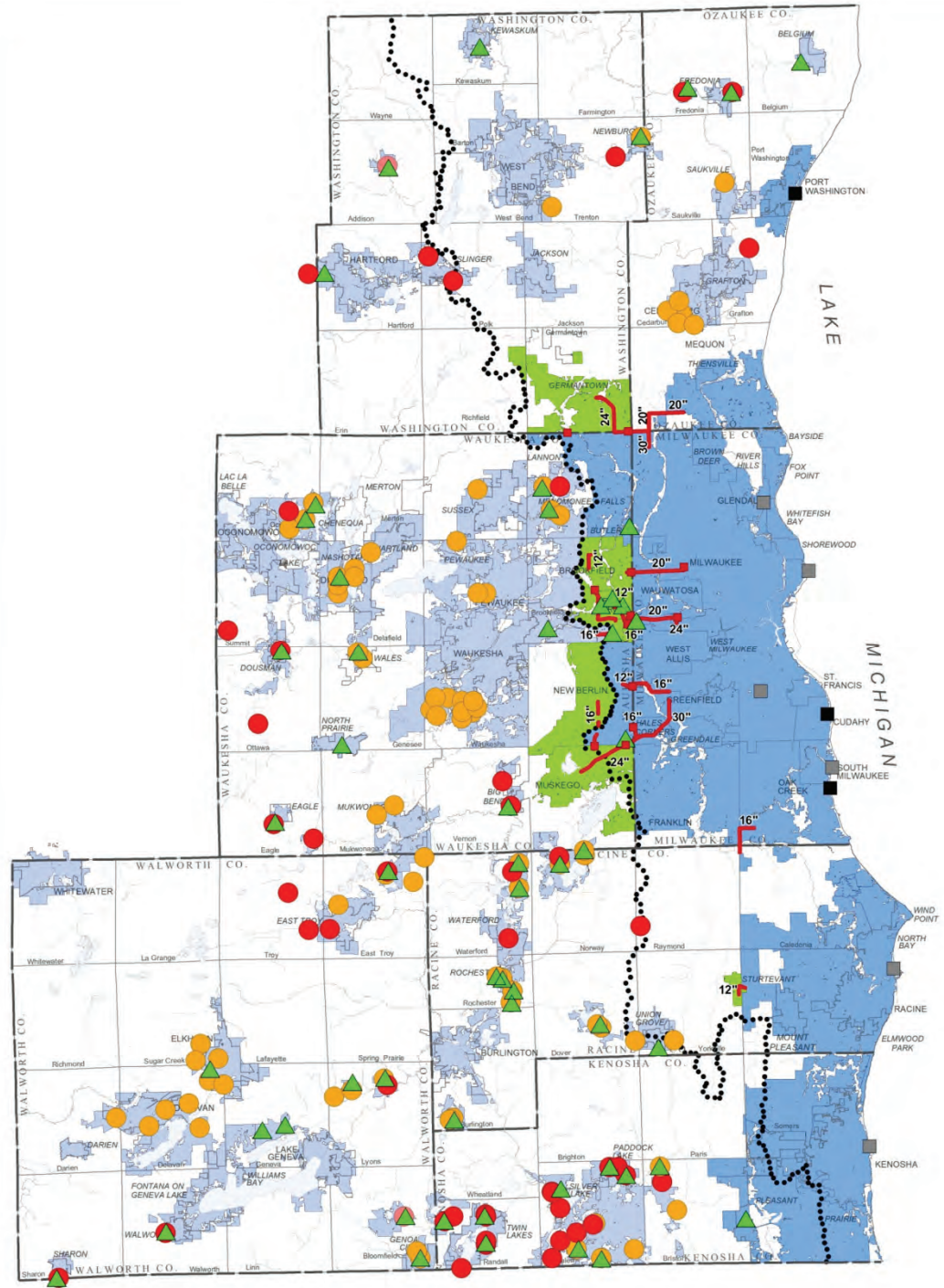
- Existing 2007 water supply facilities
- Enhanced local water conservation programs
- Continued reliance on groundwater sources to meet 2035 demand (light blue)
- Continued reliance on Lake Michigan water sources for all areas now served, meeting 2035 demand (dark blue)
- Recharge of groundwater at new construction sites to the extent required by State law
- Continued reliance on private wells for residential areas (about 180,000 persons) plus selected agricultural, irrigation, and industrial uses



# Regional Water Supply Plan Alternative Plan 2—Limited Expansion of Lake Michigan Supply



- Includes most aspects of Alternative Plan 1, but converts certain areas to Lake Michigan supply
- 4 areas east of the subcontinental divide (Germantown, Elm Grove, Brookfield-east, and Yorkville) all with existing return flow (green)
- 2 areas west of the divide (New Berlin-central, Muskego) both straddling communities with existing return flow (green)
- Includes conversion of selected treated deep aquifer sources to shallow aquifer sources





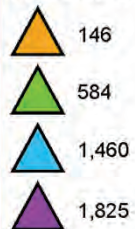
# Regional Water Supply Plan Alternative Plan 3—Groundwater Recharge

## SHALLOW AQUIFER RECHARGE FACILITIES

### RAINFALL INFILTRATION FACILITIES (MILLION GALLONS PER YEAR)



### WASTEWATER TREATMENT PLANT EFFLUENT INFILTRATION FACILITIES (MILLION GALLONS PER YEAR)



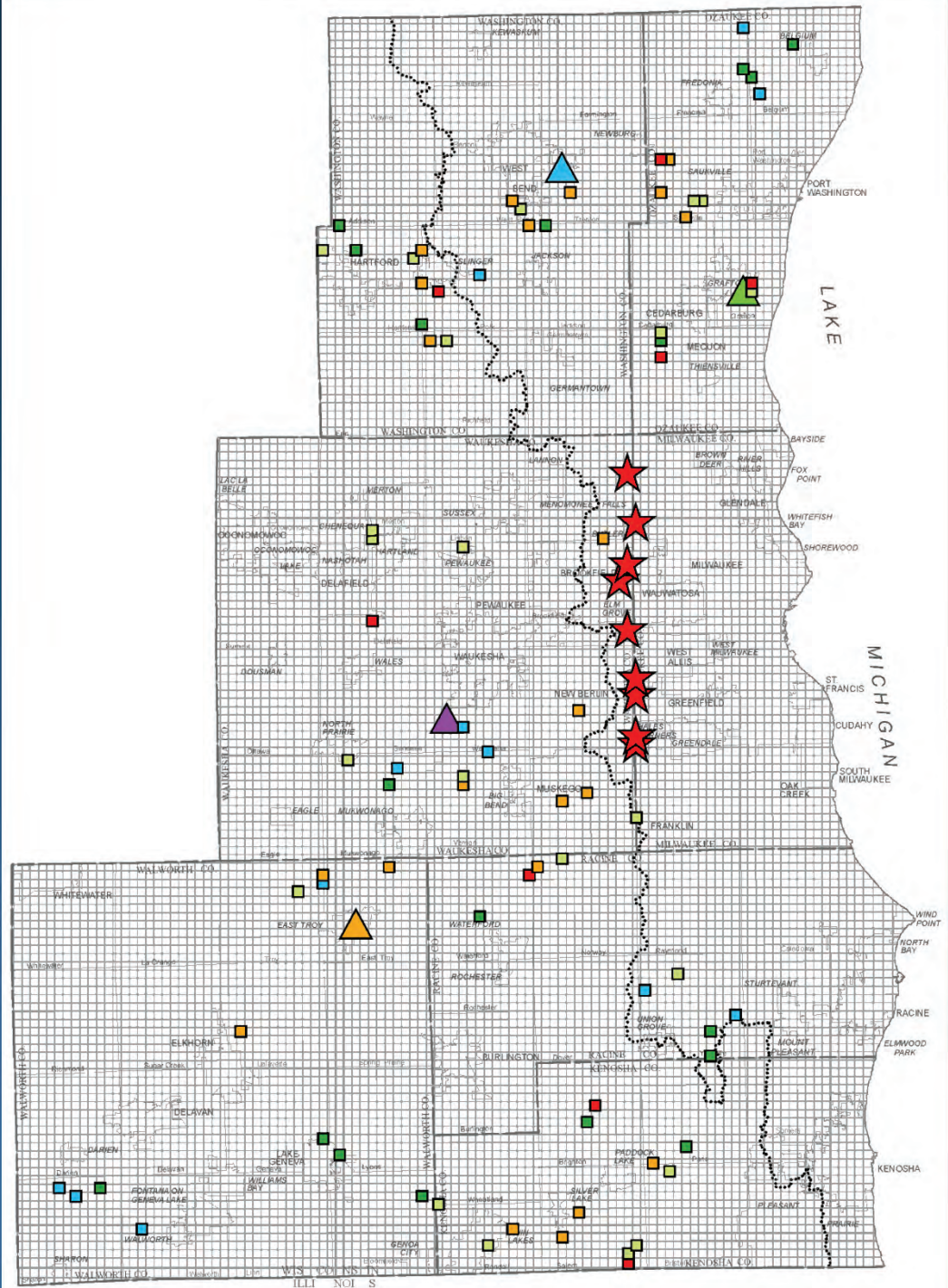
## DEEP AQUIFER RECHARGE FACILITIES

### INJECTION WELLS (MILLION GALLONS PER YEAR)



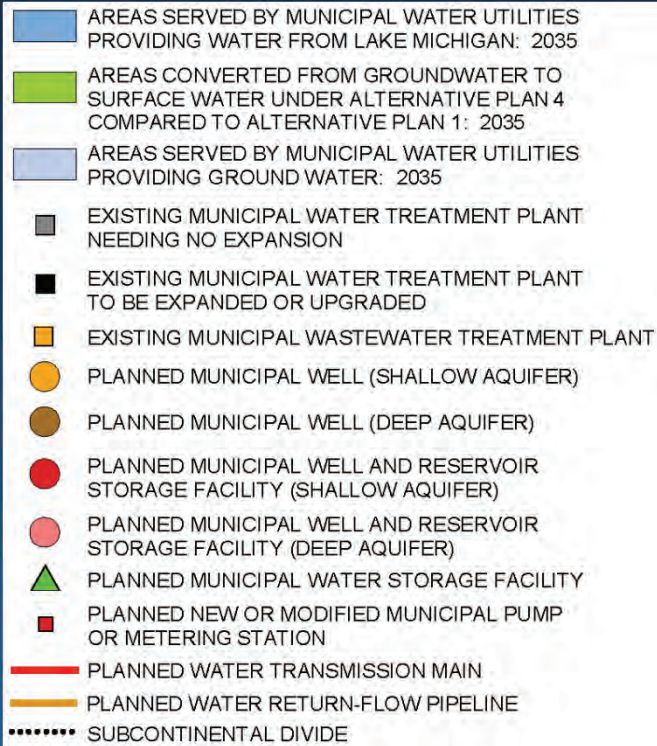
..... SUBCONTINENTAL DIVIDE

- Includes all aspects of Alternative Plan 2
- Enhancement of rainfall infiltration over 4.0 square miles of open space through bioengineering; sites to be selected
- Protection of most significant groundwater recharge areas through public purchase if necessary
- Recharge of groundwater at new construction sites beyond the extent required in State law
- Redirection of wastewater treatment plant effluent to shallow aquifer after enhanced treatment at 4 demonstration locations
- Recharge deep aquifer with treated Lake Michigan water

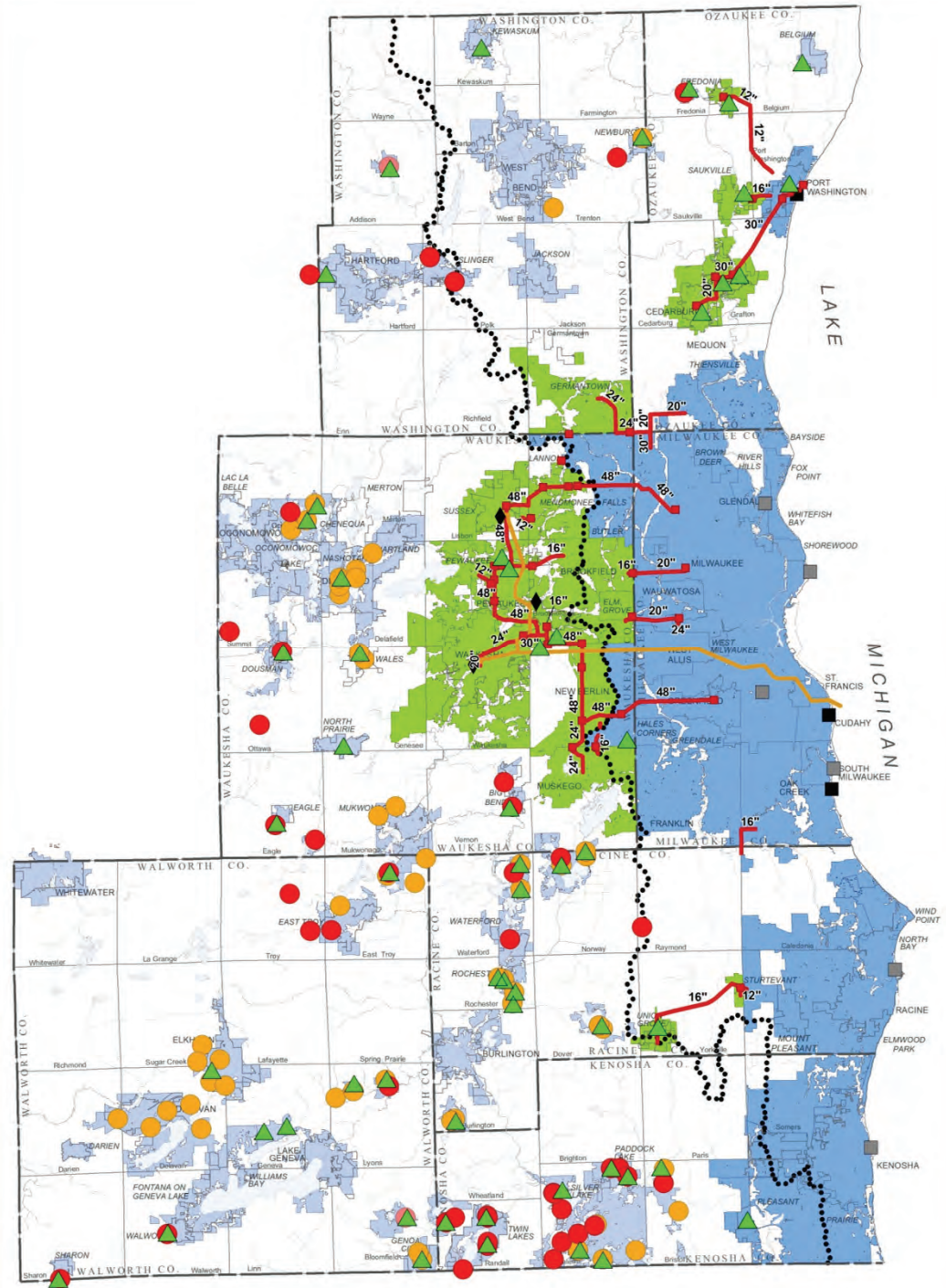


# Regional Water Supply Plan

## Alternative Plan 4—Further Expansion of Lake Michigan Supply



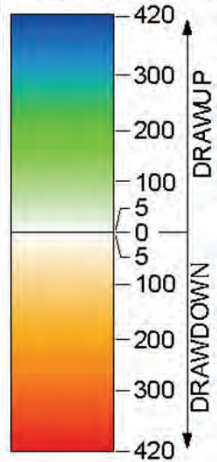
- Includes all aspects of Alternative Plan 2 but with conversion of selected additional areas to Lake Michigan supply all with return flow components
- 4 areas east of the subcontinental divide (Cedarburg, Grafton, Fredonia, Saukville) (green)
- 4 areas in communities which straddle the divide (Brookfield-west, Menomonee Falls-west, Brookfield-Town, Union Grove) (green)
- 9 areas which are in communities west of the divide within a straddling county (Pewaukee-City, Pewaukee-Village, Sussex, portion of the Town of Lisbon, Lannon, Waukesha-City, portions of the Towns of Waukesha, Genessee, and Delafield) (green)



# Evaluation of Four Alternative Plans

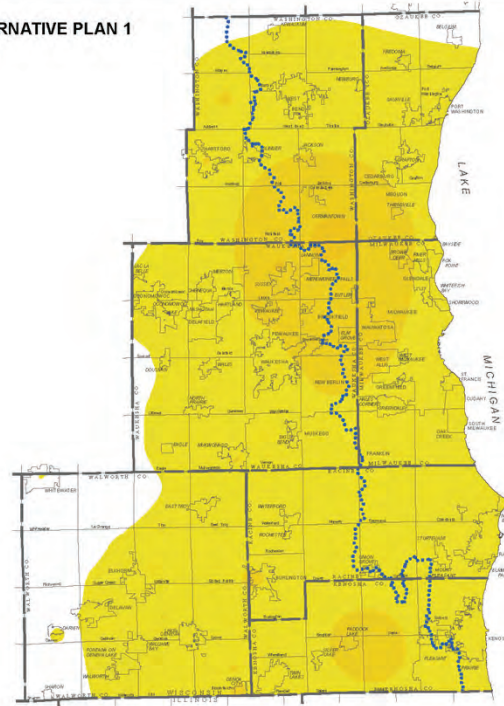
## Deep Aquifer Conditions Associated with Alternative Water Supply Plans

CHANGE RELATIVE TO 2005 CONDITIONS (FEET)

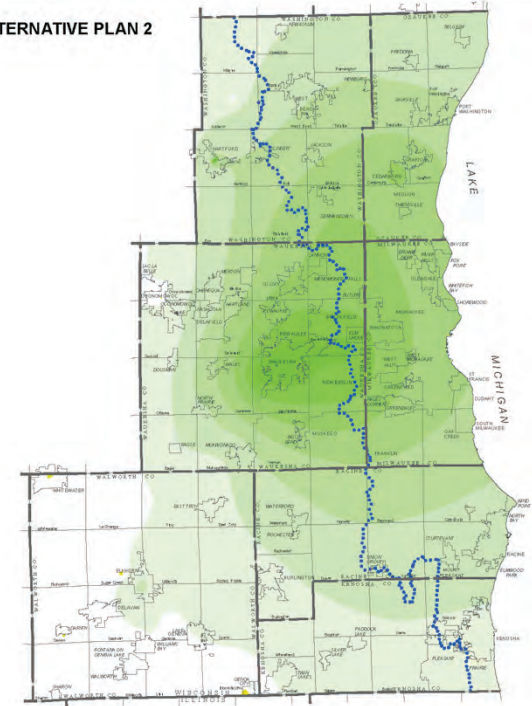


..... SUBCONTINENTAL DIVIDE

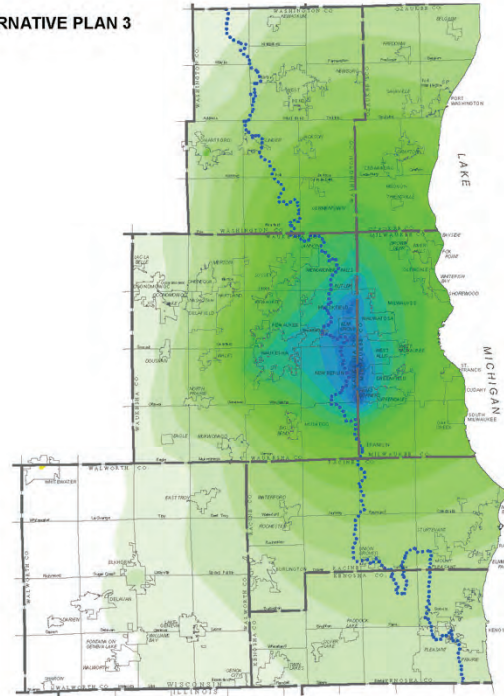
ALTERNATIVE PLAN 1



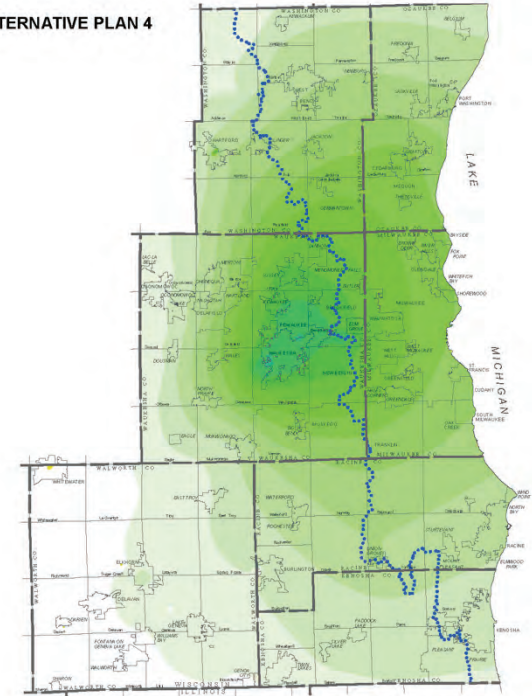
ALTERNATIVE PLAN 2



ALTERNATIVE PLAN 3



ALTERNATIVE PLAN 4





# Four Alternative Plans

## Test and Evaluation Results-Summary

	Capital Costs	Annual Operating and Maintenance Cost	Equivalent Annual Cost	Deep Aquifer Impact	Shallow Aquifer Impact	Surface Water Impact
Alternative Plan 1	\$172 million	\$5.4million	\$11.6 million	Significant slowdown in the drawdown of the deep aquifer	Localized impact around community wells	4.5% reduction in groundwater derived baseflow
Alternative Plan 2	\$254 million	\$5.8 million gross -\$0.7 million net*	\$11.1 million	Drawup in the deep aquifer	Localized impact around community wells	5.3% reduction in groundwater derived baseflow
Alternative Plan 3	\$403 million	\$11.8 million gross \$5.3 million net*	\$17.8 million	Drawup in the deep aquifer	Localized impact around community wells	1.7% reduction in groundwater derived baseflow
Alternative Plan 4	\$472 million	\$7.3 million gross -\$14.4 million net**	\$14.5 million	Drawup in the deep aquifer	Localized impact around community wells	0.7% reduction in groundwater derived baseflow

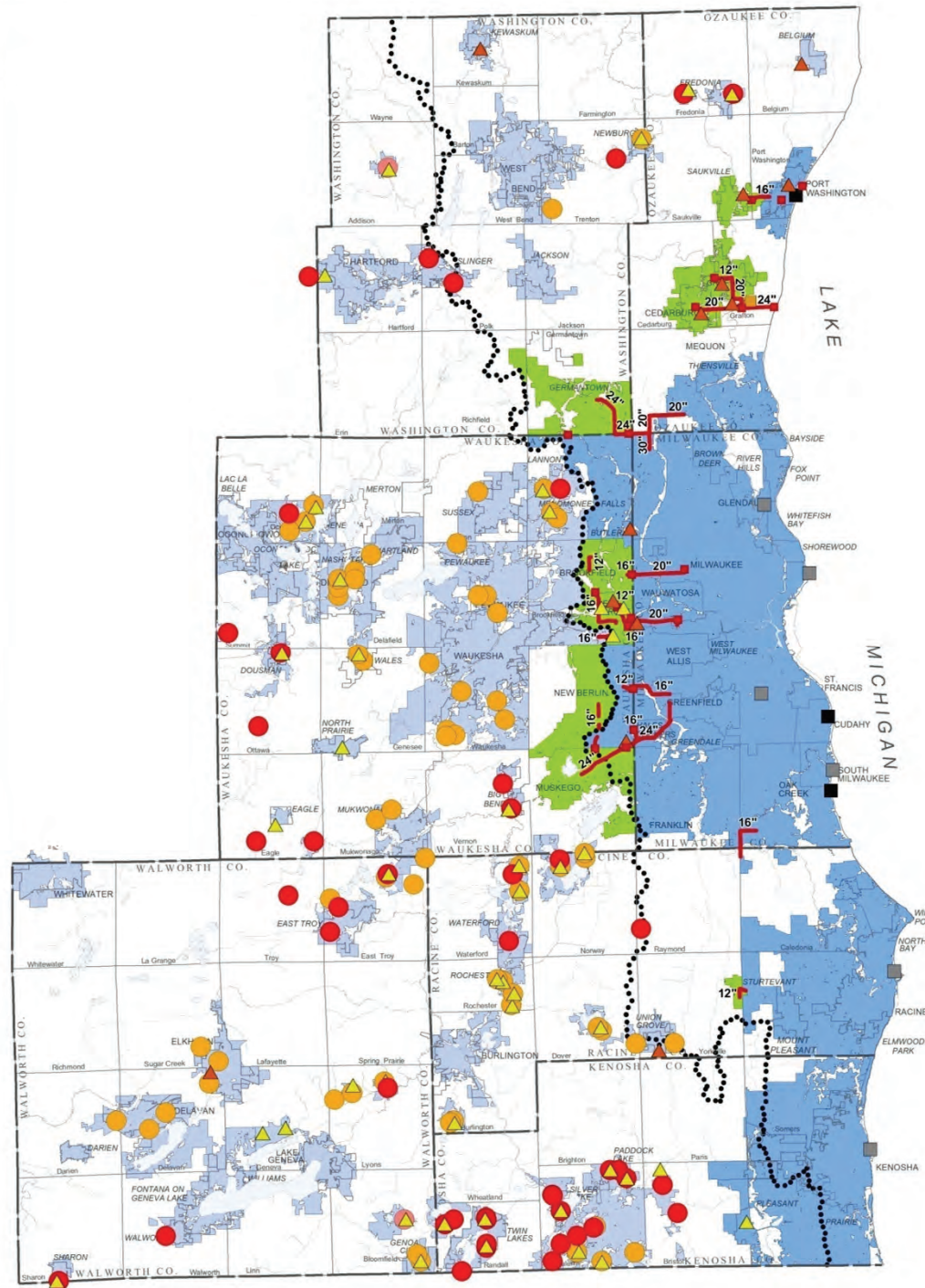
\*Includes a credit of \$6.5 million for reduced household water softening costs.

\*\*Includes a credit of \$21.7 million for reduced water softening costs.

# Regional Water Supply Plan Subalternative 1 to the Composite Plan



- Enhanced local conservation programs
- Conversion of selected areas with current return flow to Lake Michigan supply
- Conversion of selected groundwater supply from deep to shallow aquifer supply
- Enhancement of rainfall infiltration over 2.0 square miles of open space through bioengineering
- Continued reliance on private wells for selected residential areas (about 180,000 persons plus selected agricultural, irrigation, and industrial uses)

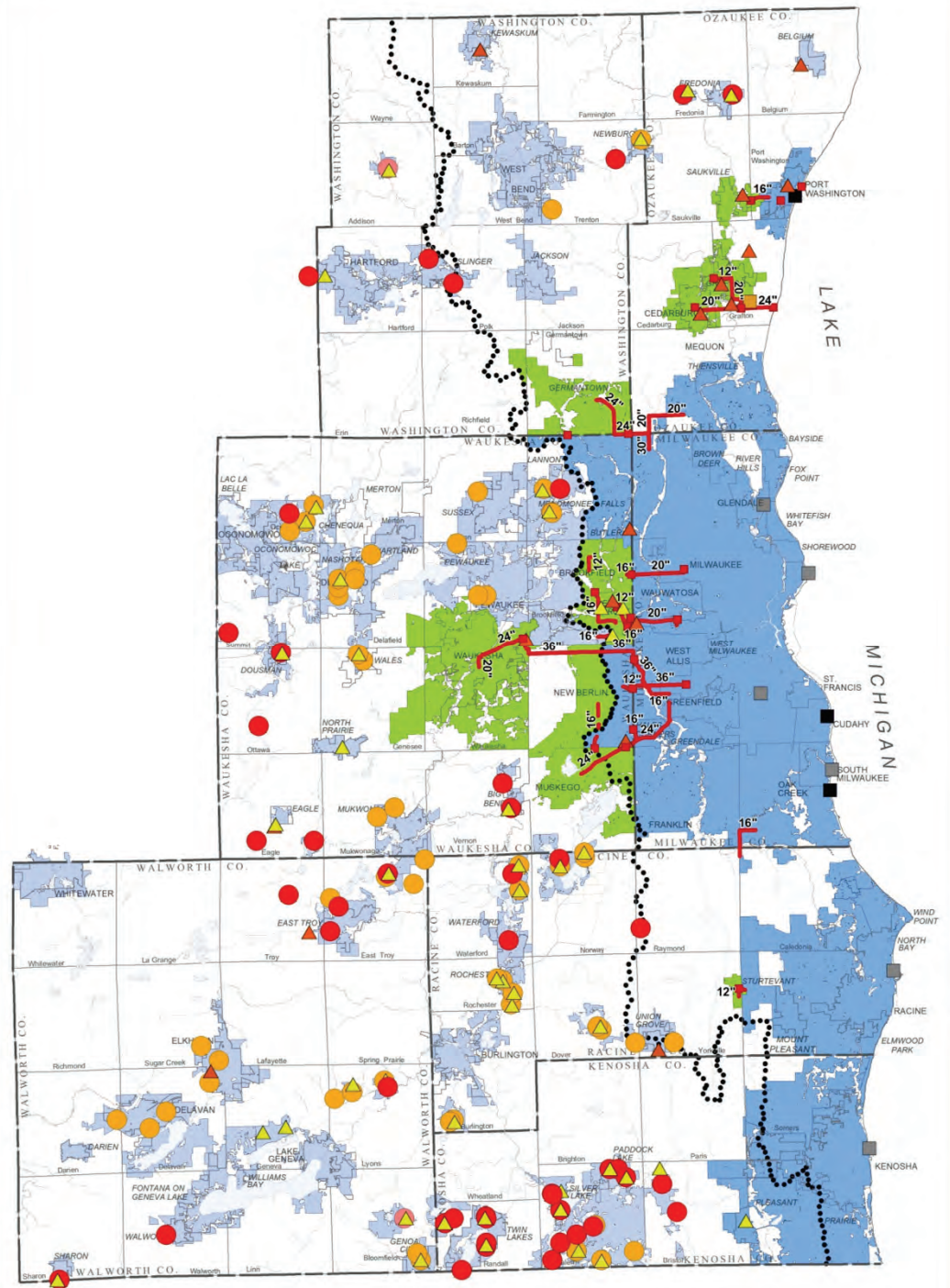


# Regional Water Supply Plan Subalternative 2 to the Composite Plan: (Preliminary Recommended Water Supply Plan)















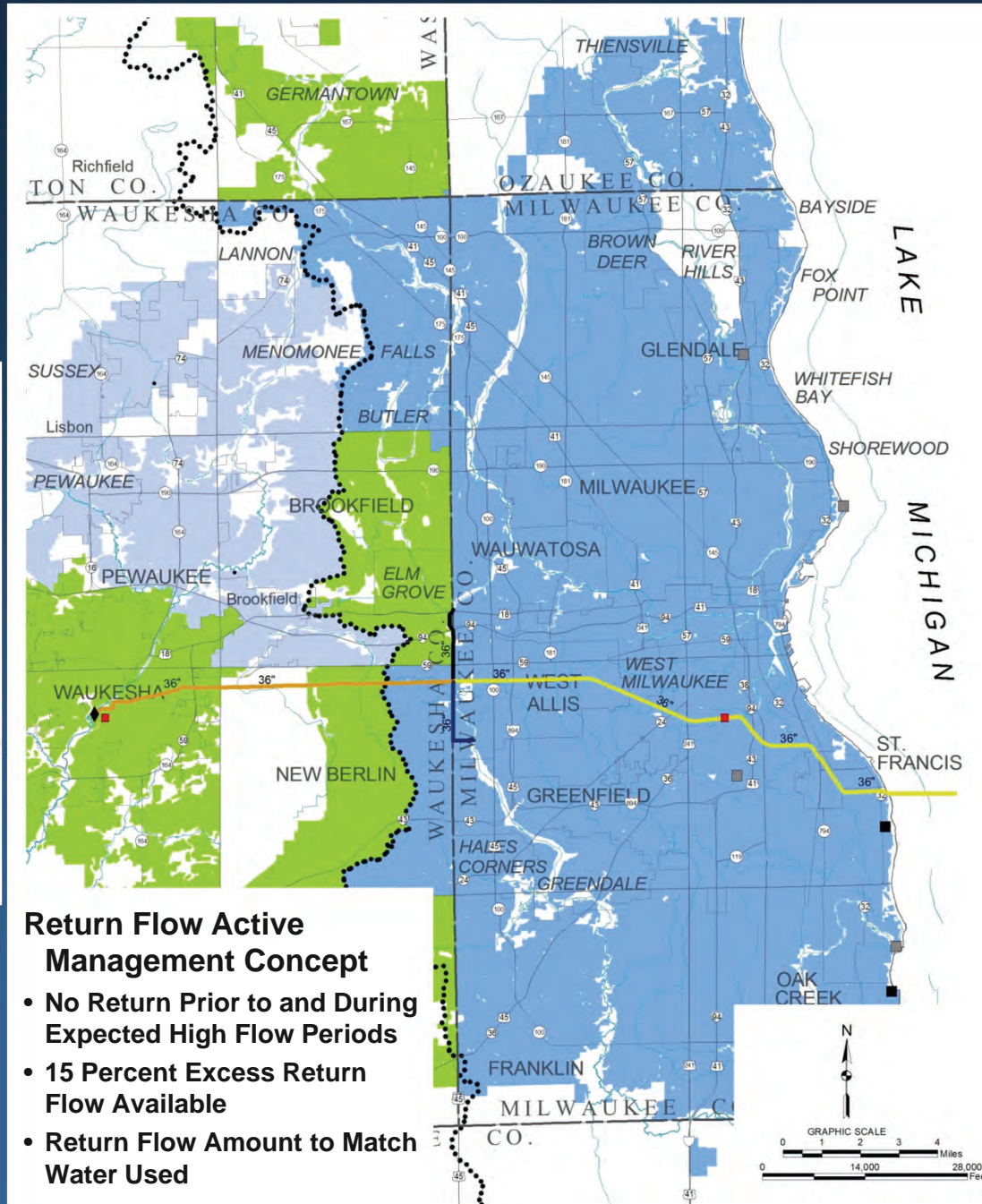
➤ Includes all aspects of subalternative 1 to the composite plan except:

- The city of Waukesha water utility is converted to a Lake Michigan supply with a return flow component
- The enhanced rainfall infiltration acreage is reduced from 2.0 to 1.7 square miles



# Options 1 – 4 for Return Flow for Subalternative 2 to the Composite Plan: Return Flow Pipelines to Lake Michigan, Underwood Creek, and Root River

-  AREAS SERVED BY PUBLIC WATER UTILITIES PROVIDING WATER FROM LAKE MICHIGAN UNDER ALTERNATIVE PLAN 1: 2035
-  AREAS CONVERTED FROM GROUNDWATER TO SURFACE WATER UNDER THE PRELIMINARY RECOMMENDED PLAN: 2035
-  AREAS SERVED BY PUBLIC WATER UTILITIES PROVIDING GROUNDWATER: 2035
-  EXISTING MUNICIPAL WATER TREATMENT PLANT NEEDING NO EXPANSION
-  EXISTING MUNICIPAL WATER TREATMENT PLANT TO BE EXPANDED OR UPGRADED
-  EXISTING MUNICIPAL WASTEWATER TREATMENT PLANT
-  PLANNED NEW PUMPING STATION
-  PLANNED WATER RETURN FLOW PIPELINE: OPTIONS 1, 2, 3, AND 4
-  PLANNED WATER RETURN FLOW PIPELINE: OPTION 1
-  PLANNED WATER RETURN FLOW PIPELINE: OPTION 2 AND 4
-  PLANNED WATER RETURN FLOW PIPELINE: OPTION 3 AND 4
-  SUBCONTINENTAL DIVIDE



## Return Flow Active Management Concept

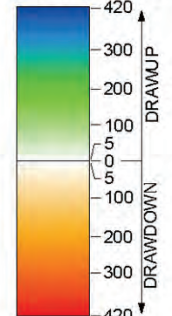
- No Return Prior to and During Expected High Flow Periods
- 15 Percent Excess Return Flow Available
- Return Flow Amount to Match Water Used

# Evaluation of Subalternative Composite Plans

## Deep Aquifer Conditions Associated with Subalternatives of the Composite Plan

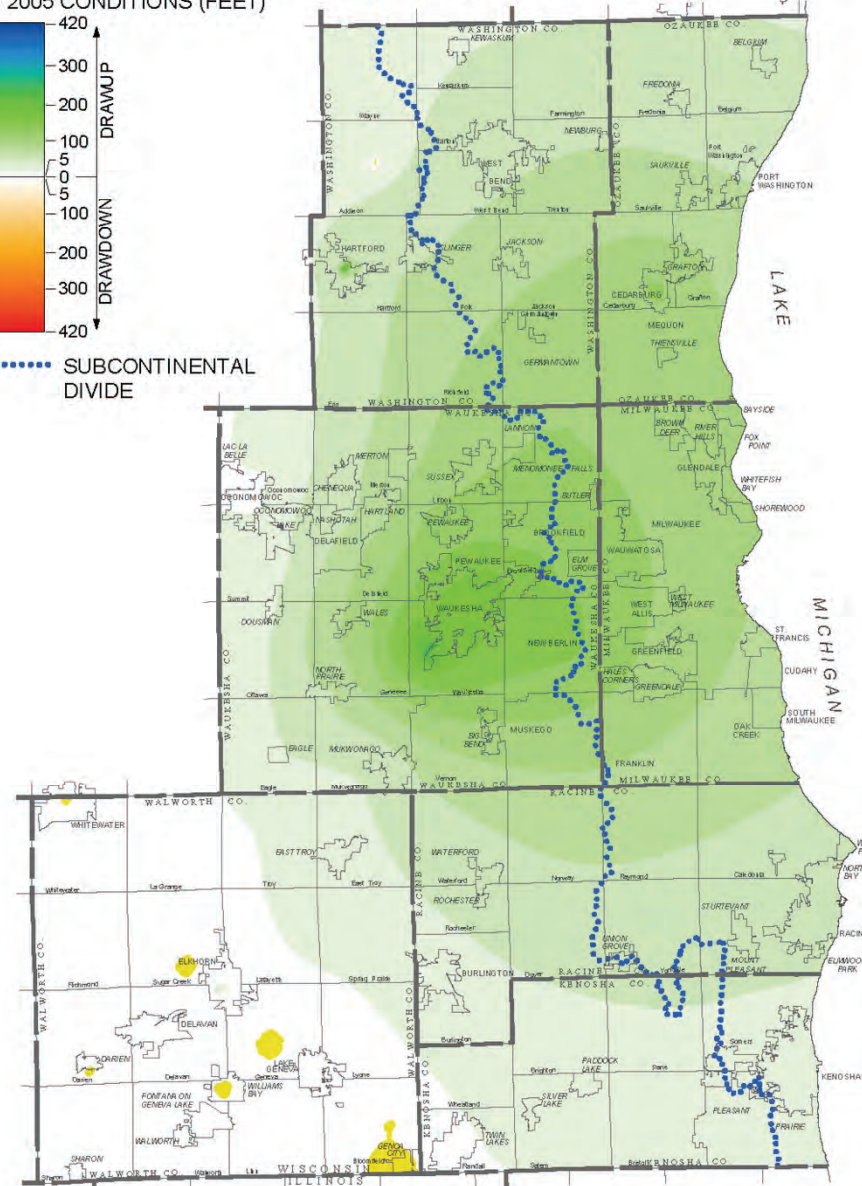
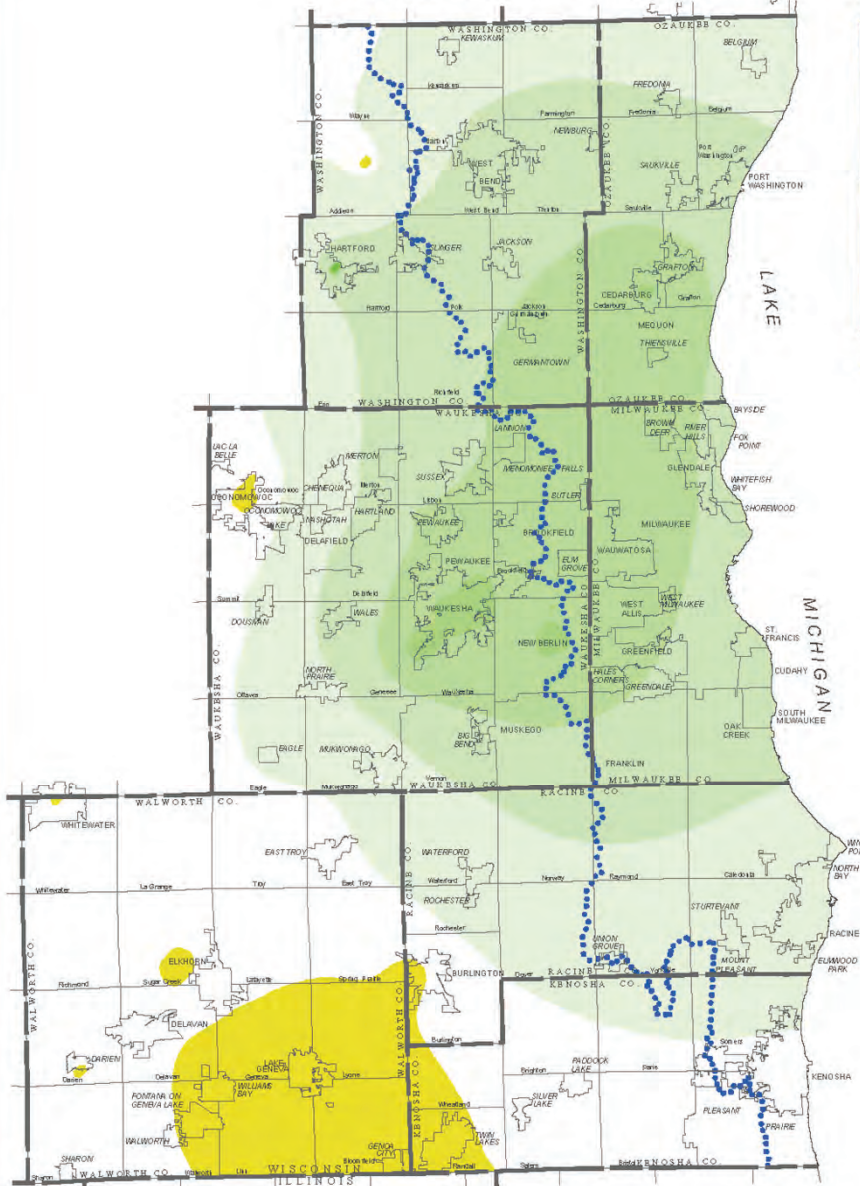
**SUBALTERNATIVE PLAN 1**

CHANGE RELATIVE  
TO 2005 CONDITIONS (FEET)



**SUBALTERNATIVE PLAN 2**

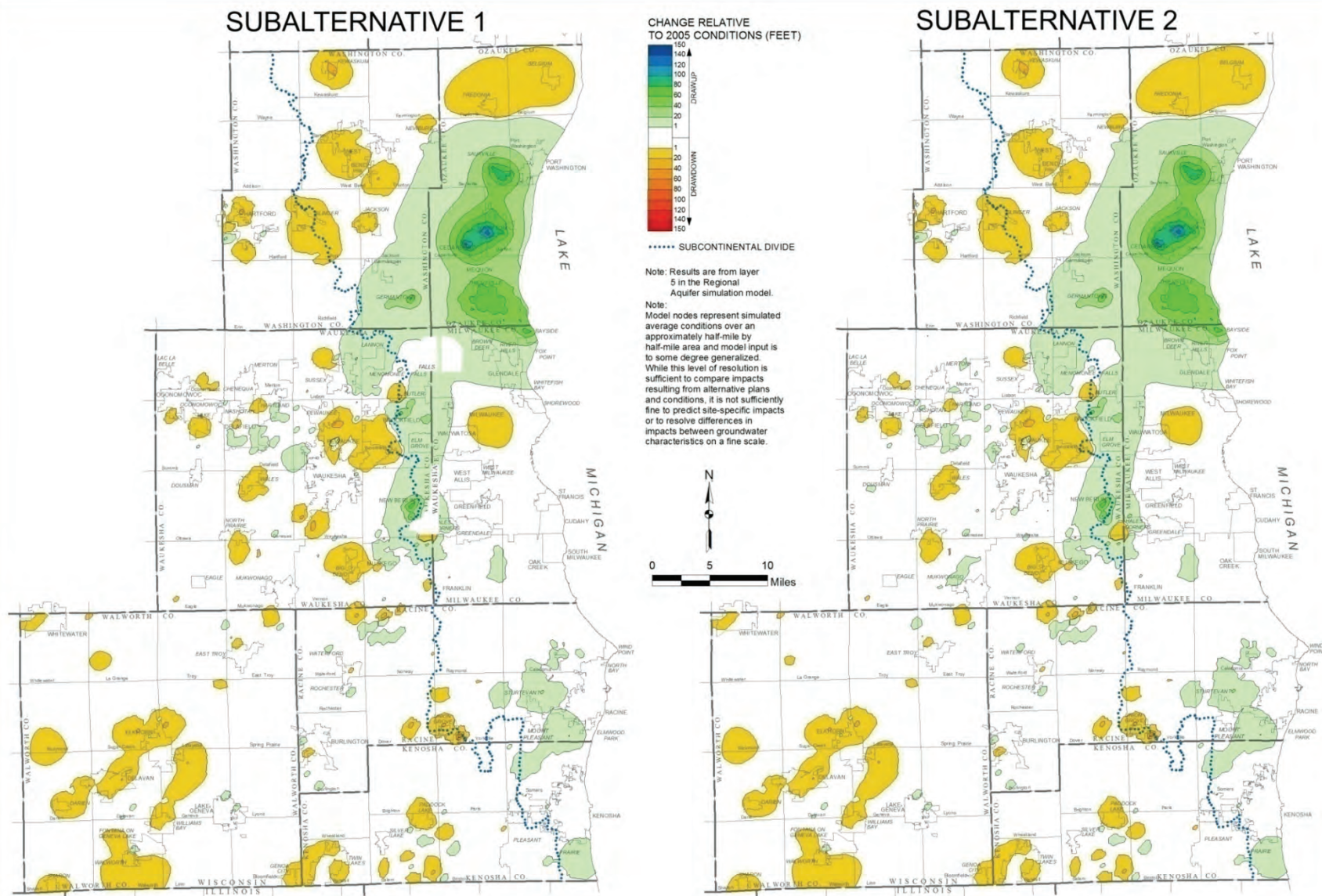
..... SUBCONTINENTAL  
DIVIDE





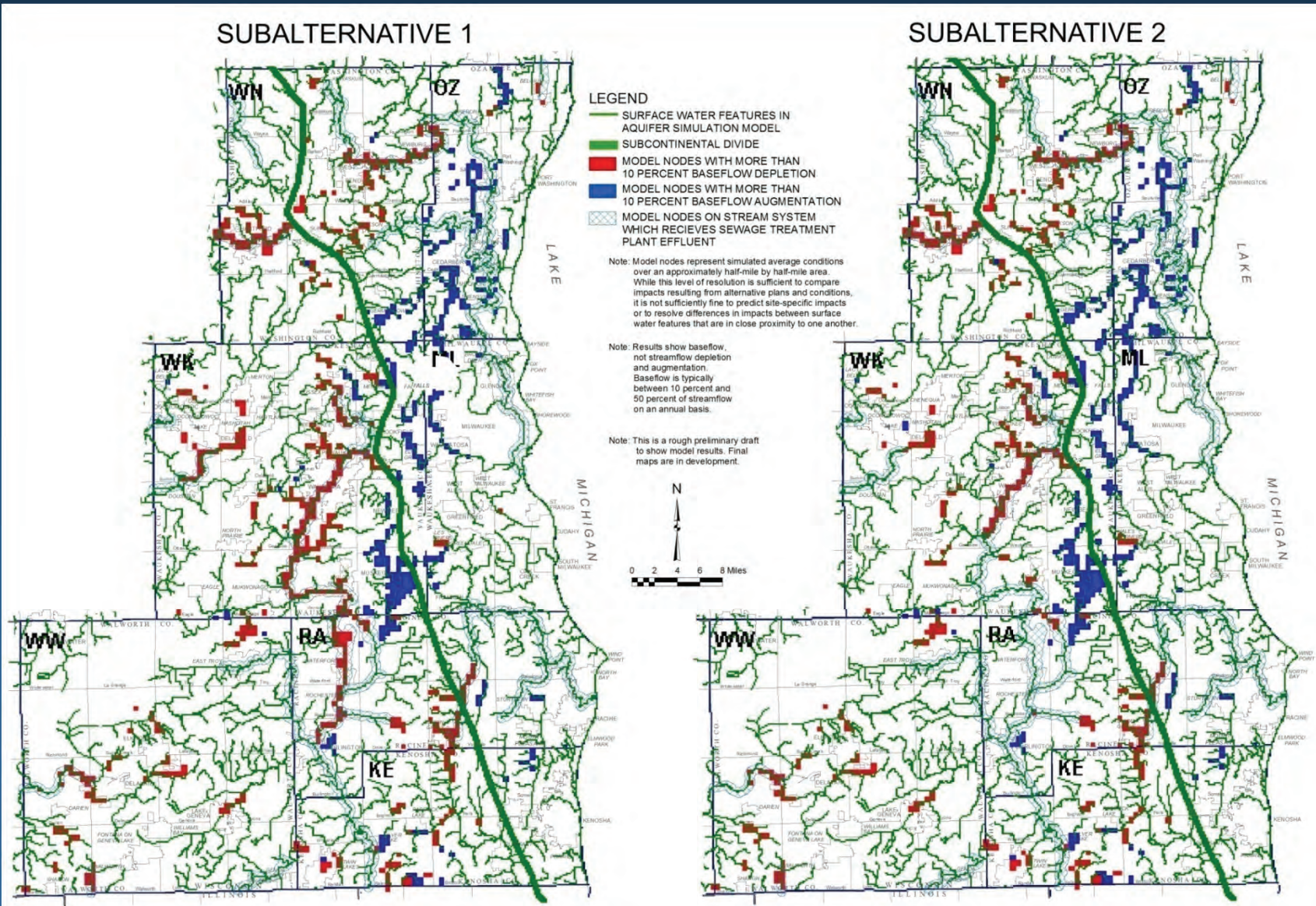
# Evaluation of Subalternative Composite Plans

## Shallow (Silurian) Aquifer Conditions Associated with Subalternatives of the Composite Plan



# Evaluation of Subalternative Composite Plans

## Surface Water Impacts Associated with Subalternatives of the Composite Plan





# Composite Plans

## Test and Evaluation Results-Summary

	<b>Capital Costs</b>	<b>Annual Operating and Maintenance Cost</b>	<b>Equivalent Annual Cost</b>	<b>Deep Aquifer Impact</b>	<b>Shallow Aquifer Impact</b>	<b>Surface Water Impact</b>
Subalternative 1 Composite Plan	\$297 million	\$8.0 million gross -\$1.4 million net*	\$13.1 million	Drawup in the deep aquifer	Localized impact around community wells	3.4% reduction in groundwater derived baseflow
Subalternative 2 Composite Plan	\$329 to 356 million	\$8.0 to 8.5 million gross -\$8.2 to 8.7 million net*	\$8.5 to 10.8 million	Drawup in the deep aquifer	Localized impact around community wells	2.0% reduction in groundwater derived baseflow

\*Includes a credit of \$9.4 million for reduced household water softening costs.

\*\*Includes a credit of \$16.7 million for reduced water softening costs.



## Summary of Preliminary Recommended Plan (Subalternative 2)

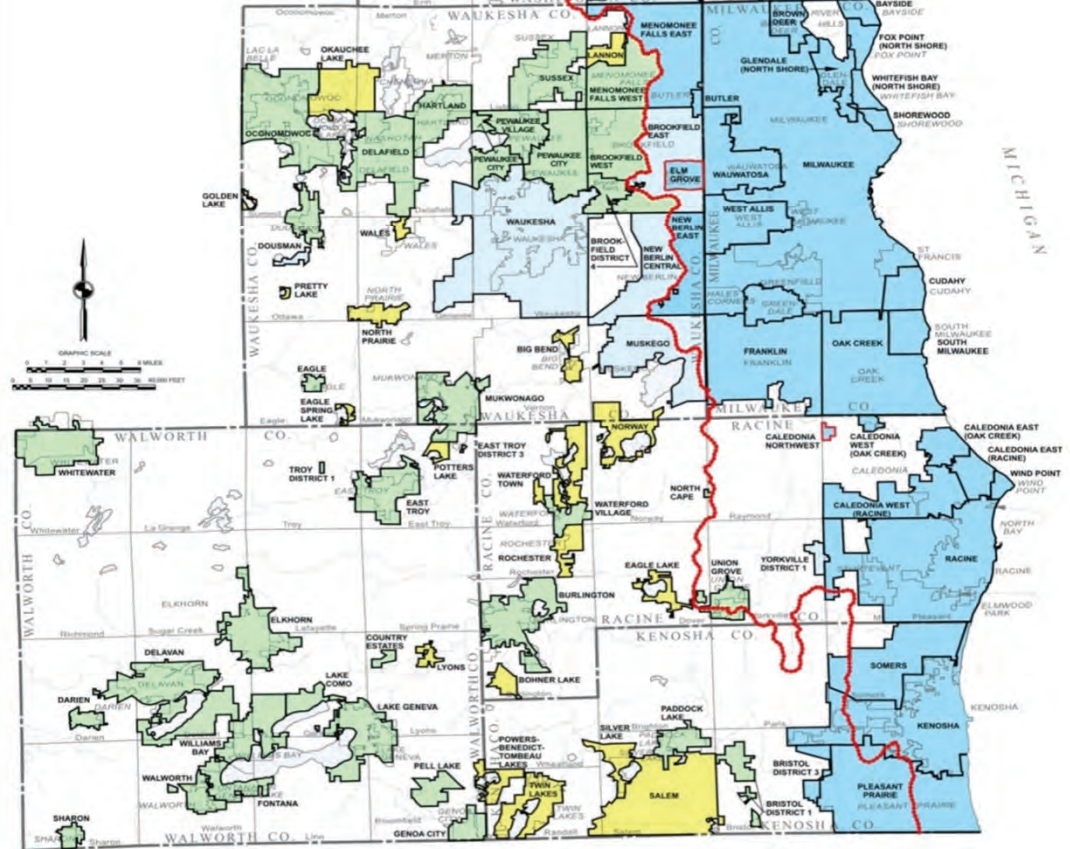
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- Sources of supply
- Water conservation programs
- Groundwater recharge area protection
- Stormwater management practices
- Regulation of high capacity wells
- Enhanced rainfall infiltration systems in strategic locations

# Sources of Supply Plan Component

## AREAS PROPOSED TO BE SERVED BY PUBLIC WATER UTILITIES IN SOUTHEASTERN WISCONSIN: 2035

- EXISTING UTILITY TO REMAIN ON LAKE MICHIGAN SUPPLY (27)
- NEW UTILITY SERVICE AREAS TO UTILIZE LAKE MICHIGAN SUPPLY (2)
- EXISTING UTILITY TO REMAIN ON GROUNDWATER SUPPLY (42)
- EXISTING UTILITY TO BE CONVERTED FROM GROUNDWATER SUPPLY TO LAKE MICHIGAN SUPPLY(9)
- POTENTIAL FUTURE UTILITY SERVICE AREAS TO UTILIZE GROUNDWATER SUPPLIES DEPENDING UPON LOCAL NEEDS AND DETERMINATIONS (21)
- - - - - SUBCONTINENTAL DIVIDE



Source: SEWRPC.



# Sources of Supply Plan Component

## SUMMARY OF WATER SUPPLY SOURCE RECOMMENDATIONS IN PRELIMINARY REGIONAL WATER SUPPLY PLAN FOR SOUTHEASTERN WISCONSIN

Utility Status	Water Supply Source	Number of Utilities	2035 Service Area Population	
			Number	Percent of Total
Existing–No Change in Supply Source	Lake Michigan	27	1,411,000	62
	Groundwater Including 2 utilities Partly served by Lake Michigan	42	383,000	17
	Subtotal	69	1,794,000	79
Existing–Convert from Groundwater to Lake Michigan	Lake Michigan	9	219,000	9
Potential New–Only if local conditions dictate a need and local initiative is undertaken	Lake Michigan	2	7,000	1
	Groundwater	21	78,000	3
	Subtotal	23	85,000	4
None–Private Water Supply	Groundwater	- -	178,000	8
Total	- -	101	2,276,000	100
Total by Supply Source	Lake Michigan	38	1,637,000	72
	Groundwater	63	639,000	28
	Total	101	2,276,000	100



# Sources of Supply Plan Component

## Preliminary Regional Water Supply Plan Lake Michigan Diversion Element

Fundamental reasons for recommending the additional areas be supplied with Lake Michigan waters.

- Reduction in chloride discharge.
- Favorable impacts on recovery of deep aquifer.
- Favorable environmental impacts on baseflows to surface waters.
- Ability to preserve groundwater for other uses, ie. agriculture.
- Opportunity to use excess water production capacity at the Milwaukee Water Works and associated fiscal benefits for Milwaukee residents.



# Water Conservation Program Plan Component

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## Base-Level Program. 24 Utilities

- Utilities currently utilizing Lake Michigan needing no major infrastructure to meet current and future needs.
- Utilities currently utilizing Lake Michigan needing no major infrastructure to meet current and near-term future needs, and requiring new infrastructure to meet long-term future needs associated with new development.

## Intermediate-Level Program. 54 Utilities

- Utilities to be converted to a Lake Michigan supply with an existing return flow and requiring additional infrastructure for the new supply connection.
- Utilities continuing to utilize groundwater with no or modest infrastructure needs and no outstanding groundwater quality issues to resolve.

## Advanced-Level Program. 23 Utilities and Potential New Utilities

- Utilities to be converted to a Lake Michigan supply with a need for a new return flow system, as well as supply infrastructure, thus requiring significant additional infrastructure.
- New utilities serving existing development if and when conversion to a municipal system is anticipated based upon local initiatives.





# Water Conservation Program-Level Recommendations

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## Base Level

### ➤ Objective:

- 4 percent reduction in average daily demand, 6 to 10 percent reduction in maximum daily demand.

### ➤ Potential Program Components:

- Conduct water audit
- Develop leak detection and repair program
- Water main maintenance and replacement program
- Moderate level of public information and education
- Outdoor watering reduction measures, such as rain barrels and time and/or limited-day watering



# Water Conservation Program-Level Recommendations—continued

## Intermediate-Level

### ➤ Objective:

- 6 to 8 percent reduction in average daily demand, 12 to 16 percent reduction in maximum daily demand.

### ➤ Potential Program Components:

- All of base-level components
- Higher level of public information and education
- Plumbing retrofits (low-level), such as low-volume shower heads
- Moderate conservation rate structure measures

## Advanced-Level

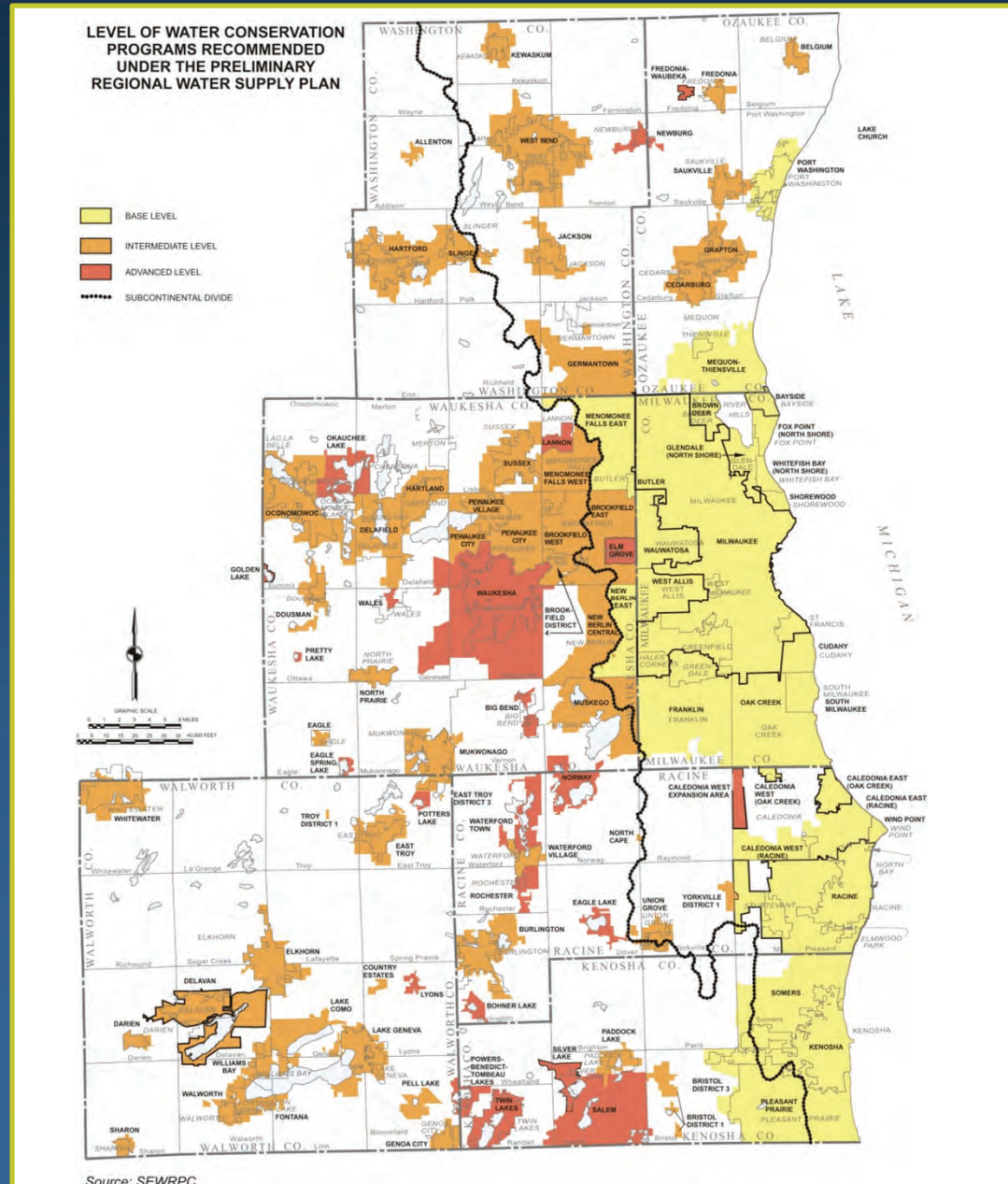
### ➤ Objective:

- 10 percent reduction in average daily demand, 18 percent reduction in maximum daily demand.

### ➤ Potential Program Components:

- All of intermediate-level components
- Additional fixture and plumbing retrofits, such as toilet replacement rebate program
- More aggressive conservation rate structure measures

# Water Conservation Plan Component



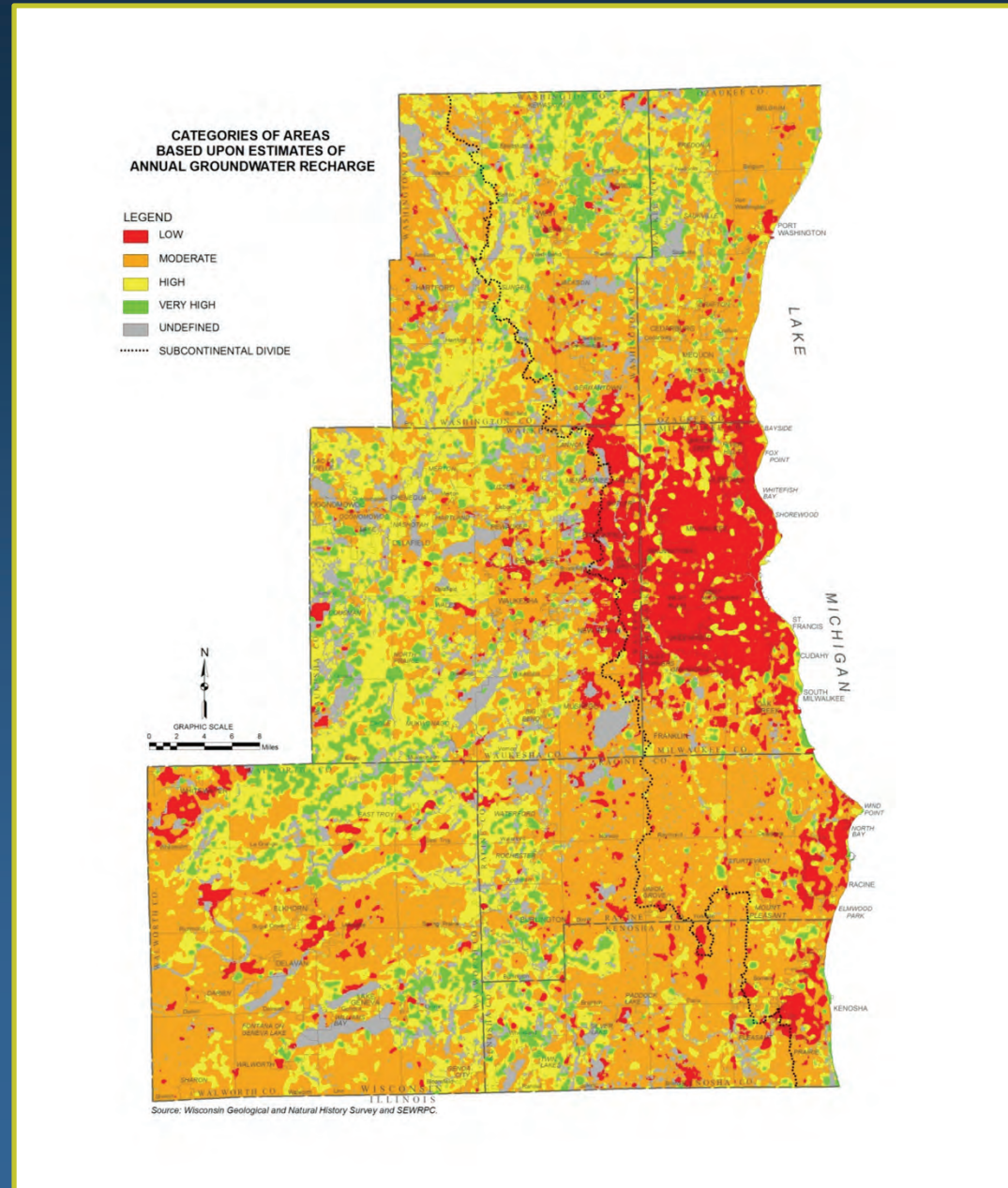


## Groundwater Recharge Area Protection Plan Component

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- The preservation of groundwater recharge areas found to have a high or very high recharge potential.
- About 74 percent of the highly rated and very highly rated recharge areas may be expected to be preserved by inclusion in the environmental corridors, isolated natural areas, and prime and other agricultural areas identified for preservation in the regional land use plan.
- Additional areas can be protected in medium or low density development areas by utilizing stormwater management practices designed to maintain the natural hydrology.
- Over time, consider expansion of environmental corridors to include selected areas with very high or high groundwater recharge potential.

# Groundwater Recharge Area Protection Plan Component





## Stormwater Management Practices Plan Component

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- **Widespread implementation of state-of-the-art stormwater management practices, including application of treatment and infiltration systems.**
  - Will largely be implemented through NR 151
- **To the extent practicable maintain the natural recharge of areas committed to residential and selected nonresidential land use developments.**



## High Capacity Well Regulation Plan Component

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- **Recommends analyses and monitoring of the impacts of potential new wells on the shallow aquifer, existing wells, and surface waters.**
  - **Develop the necessary understanding of the hydrogeological system associated with each candidate well site.**
  - **Monitoring of water levels in the vicinity of potential new high-capacity wells in the shallow aquifer, to establish a baseline, including levels in private wells expected to be maintained.**
  - **Monitoring to continue during the test well phase of evaluation and during the operation of the well.**



## Enhanced Rainfall Infiltration Systems Plan Component

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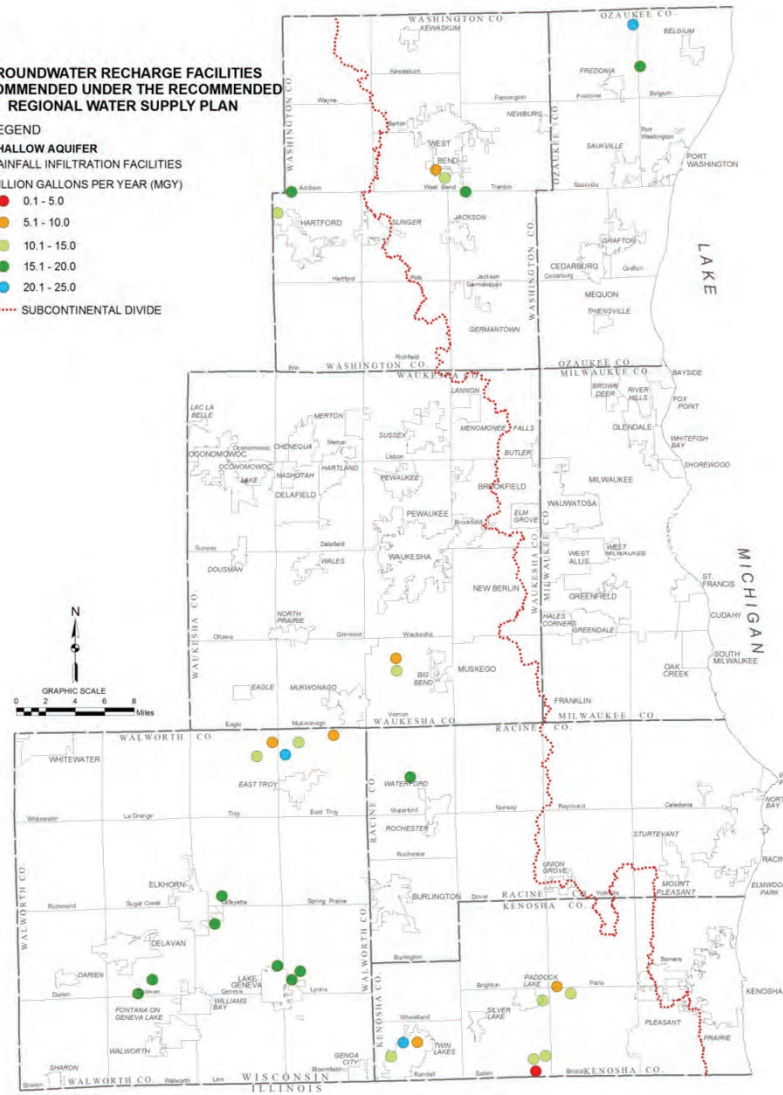
- Installation of enhanced rainfall infiltration systems in areas where evaluations conducted in conjunction with siting of high-capacity wells in the shallow aquifer indicate probable reductions in base flow to nearby surface waterbodies or water levels in lakes or wetlands.
  - A variety of designs and methods are possible for these systems and the appropriate design will need to be determined on a case-by-case basis. The systems could be in the form of rain gardens, larger bioretention basins, infiltration ponds, infiltration ditches, and other systems.
  - A total of 32 of these rainfall infiltration systems are envisioned under the preliminary plan.



# Enhanced Rainfall Infiltration Plan Component

## GROUNDWATER RECHARGE FACILITIES RECOMMENDED UNDER THE RECOMMENDED REGIONAL WATER SUPPLY PLAN

- LEGEND**  
**SHALLOW AQUIFER**  
**RAINFALL INFILTRATION FACILITIES**  
 MILLION GALLONS PER YEAR (MGY)
- 0.1 - 5.0
  - 5.1 - 10.0
  - 10.1 - 15.0
  - 15.1 - 20.0
  - 20.1 - 25.0
- SUBCONTINENTAL DIVIDE



Source: SEWRPC.



## Summary of Public Informational Activities Associated with the Regional Water Supply Planning Program

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- **Nine Public Informational Meetings plus 2 sessions of the “WaterWise Conference” on the preliminary recommended plan (181 person participated).**
- **33 presentations to local elected officials.**
- **91 presentations to interested business, civic, and environmental groups and organizations.**
- **Publication and distribution to about 2,000 elected and appointed officials and interested citizens of three newsletters devoted to the water supply plan.**
- **Comments and input received were thoroughly evaluated and changes incorporated as appropriate.**
  - **Preliminary recommended plan was advanced as final recommended plan with minor changes.**



## Summary of Comments

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- **Plan cost**
- **Region population forecast too high**
- **Plan should not have been based on existing land use and regional land use plan**
- **Impact of Waukesha return flow on Underwood Creek/Root River and Lake Michigan**
- **Impact of increased shallow groundwater water supply on private wells, watercourses, and lakes**
- **Need for new municipal water utilities in Kenosha County and Walworth County**



## SEWRPC Environmental Justice Task Force (EJTF)

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- **An advisory body established by the Commission to enhance consideration and integration of environmental justice for minority and low income populations in regional planning**
  - **Consider the impacts and broadly defined costs and benefits of regional plans on minority and low income populations**
  - **Recommended the conduct of a socio-economic impact analysis of the regional water supply plan**
    - **University of Wisconsin – Milwaukee Center for Economic Development (UWM-CED)**



## **UWM-CED SocioEconomic Impact Analysis: Framework**

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- **What impact would implementation of the regional water supply recommendations have on the overall distribution of population, including racial segregation patterns, in the Region?**
- **What impact would implementation of the regional water supply recommendations have on the overall distribution of job locations in the Region?**
- **What impact would implementation of the regional water supply recommendations have on the fiscal health and well-being of those communities in the Region wherein reside relatively large populations of low and moderate income families?**
- **What impact would implementation of the regional water supply recommendations have on housing and other land use patterns in the Region?**
- **To what extent would implementation of the regional water supply recommendations contribute to any failure of the plan to meet Federal regulations attendant to civil rights and environmental justice?**



# UWM-CED SocioEconomic Impact Analysis: Summary

- **Water Conservation Programming**
  - Designed to improve the use of supply and maintain the sustainability of sources of water supply for all water consumers - no disproportionate environmental or fiscal impact on any segment of the population and therefore it is unlikely this recommendation would have any environmental justice impacts
- **Recharge Area Protection**
  - Such areas are typically undevelopable or lands within the delineated environmental corridors that SEWRPC recommends not be developed therefore it is unlikely that this recommendation would have any environmental justice impacts
  - Recommendation: The delineation and any regulation of recharge areas should include an inventory of affected population and land use and consider the impacts on the affected population
- **Stormwater Management Practices**
  - Contribute to a sustainable groundwater supply therefore unlikely to have an adverse impact on the environment or have any environmental justice impacts.



# UWM-CED SocioEconomic Impact Analysis: Summary

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- **High Capacity Well Siting Procedures**
  - Procedures are recommended to safeguard the quantity and quality of the groundwater supply, and to ensure that groundwater extraction will not have a negative impact on nearby surface waters through baseflow depletion. Based on this, it is unlikely that high capacity well siting procedures would have any adverse impact on the environment or that it would have any environmental justice impacts.
- **Enhanced Rainfall Infiltration Systems**
  - The determination to use is site specific, based on local conditions and needs. Based on this, it is unlikely that the installation of enhanced rainfall infiltration systems would have an adverse impact on the environment or that it would have any environmental injustice impacts.
  - Systems can be designed to have positive environmental impacts and typically would be located on open space lands.



# UWM-CED SocioEconomic Impact Analysis: Summary

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- **New Utilities**
  - **Recommendation:** The Regional Water Supply Plan (RWSP) should include information on how new utilities and communities can provide low or no interest loans for low to median income homeowners.
- **Public Participation**
  - **Recommendation:** The RWSP Technical Advisory Committee should include one or more representative from the EJTF or Environmental justice community.
  - **Recommendation:** Future updates to the Regional Water Supply Plan should include a formal public participation plan.





# UWM-CED SocioEconomic Impact Analysis: Summary

## Source of Supply

- 11 Utilities proposed to Receive Lake Michigan Water (and potential provider utilities)
  - *Past trends indicate that a significant increase in the number and percent of low-income persons or families living at or below the poverty level has occurred over the past 40 years in the cities of Kenosha, Milwaukee, and Racine (Lake Michigan water providing) while it has declined in many of the selected suburban communities (Lake Michigan water receiving). These trends are likely to continue regardless of source of supply.*
    - RWSP studies indicate that groundwater if properly managed, can support existing and planned development in Southeastern Wisconsin through the year 2035.
    - UWM –CED interviews with area planners, developers, and utility managers indicate that the source of water—groundwater or Lake Michigan—has no impact on development/redevelopment.
    - UWM –CED studies of the existing and proposed water utility service areas of the proposed Lake Michigan water receiving communities concluded that these service areas largely include substantial areas which are currently developed, infill development, or lands which are undevelopable.



## UWM-CED SocioEconomic Impact Analysis: Summary

- *The recommendation to convert to Lake Michigan water helps to improve Milwaukee Water Works system efficiency, keep system costs low, and ultimately, encourage lower rates, based on the excess capacity of Milwaukee Water Works which currently utilizes only about half of its designed water production capacity. As fixed costs make up the greatest portion of water rates (70 percent or more), potential benefits extend to those areas with a higher percentage of lower income populations.*
- *The recommendation for 9 Utilities to change source of supply to Lake Michigan was made, in part, to aid in improving water quality (reduce chloride discharges from water softeners and minimize impacts on baseflow to surface waters). This should improve environmental quality for all populations.*
- *The implementation of this recommendation presumes the development of an intergovernmental cooperative and water service purchase agreement in which two or more communities would have to be in agreement over the costs of service extension to be paid by the purchasing community, and the amount of water to be provided and the delineation of the water service area. The agreement can also address additional payments to be made by the purchasing community, agreements on business recruitment, and any other factors (such as affordable housing or public transit) to address existing socio-economic imbalances.*



## Environmental Justice Task Force Action

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- Accepted the UWM-CED SocioEconomic Impact Analysis report at their meeting of September 2, 2010
  - Concerns discussed by EJTF
    - Need for a better summary of findings and assumptions
    - Scope and purpose of SocioEconomic Impact Analysis
    - Outreach to minority and low income populations
    - Need for study to consider long term future (year 2035) and whether forecasts, plans, and assumptions will be valid (population, land use, water supply).
    - The availability of groundwater to meet future water supply needs, particularly, the City of Waukesha (consistency of RWSP and Waukesha diversion application)
    - The Advisory nature of SEWRPC and of the EJTF



## Environmental Justice Task Force Action—continued

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- Concerns expressed during meeting public comment
  - Assumptions upon which RWSP and SocioEconomic impact analysis (SEI) are based (which if incorrect, in their opinion could result in adverse socioeconomic impacts)
    - That there are alternatives, if properly managed, to Lake Michigan water to the year 2035
    - That groundwater supplies will be managed sustainably to 2035
    - That communities will follow land use plans to 2035
    - That the costs of groundwater alternatives are similar to Lake Michigan water
    - The sustainability of groundwater beyond the year 2035
  - Whether the RWSP and SEI are consistent with the assertion in the City of Waukesha diversion application that there is no “reasonable” alternative to Lake Michigan water



## Environmental Justice Task Force Action—continued

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- Concerns expressed during meeting public comment (continued)
  - That the SEI should recommend that any agreement for supplying Lake Michigan water should address the racial, ethnic, and economic disparities in the Region



## Remaining Steps

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- **Planning Research Committee Review – November 9**
  - Chapter X, Recommended Plan
  - Chapter XI, Plan Implementation
  - Chapter XII, Summary and Conclusions
- **Commission Meeting – December 1**