

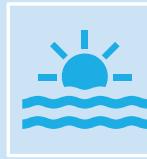


JANUARY 2022



Alternative Water Supply Investigation

January 2022



Current Water Supply Sources and Sustainability Concerns



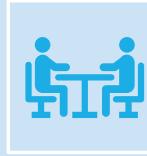
Recent Studies and Investigations By Neighboring Communities



Details of Alternatives Investigated by the Village



Cost Comparison of Most Feasible Alternatives

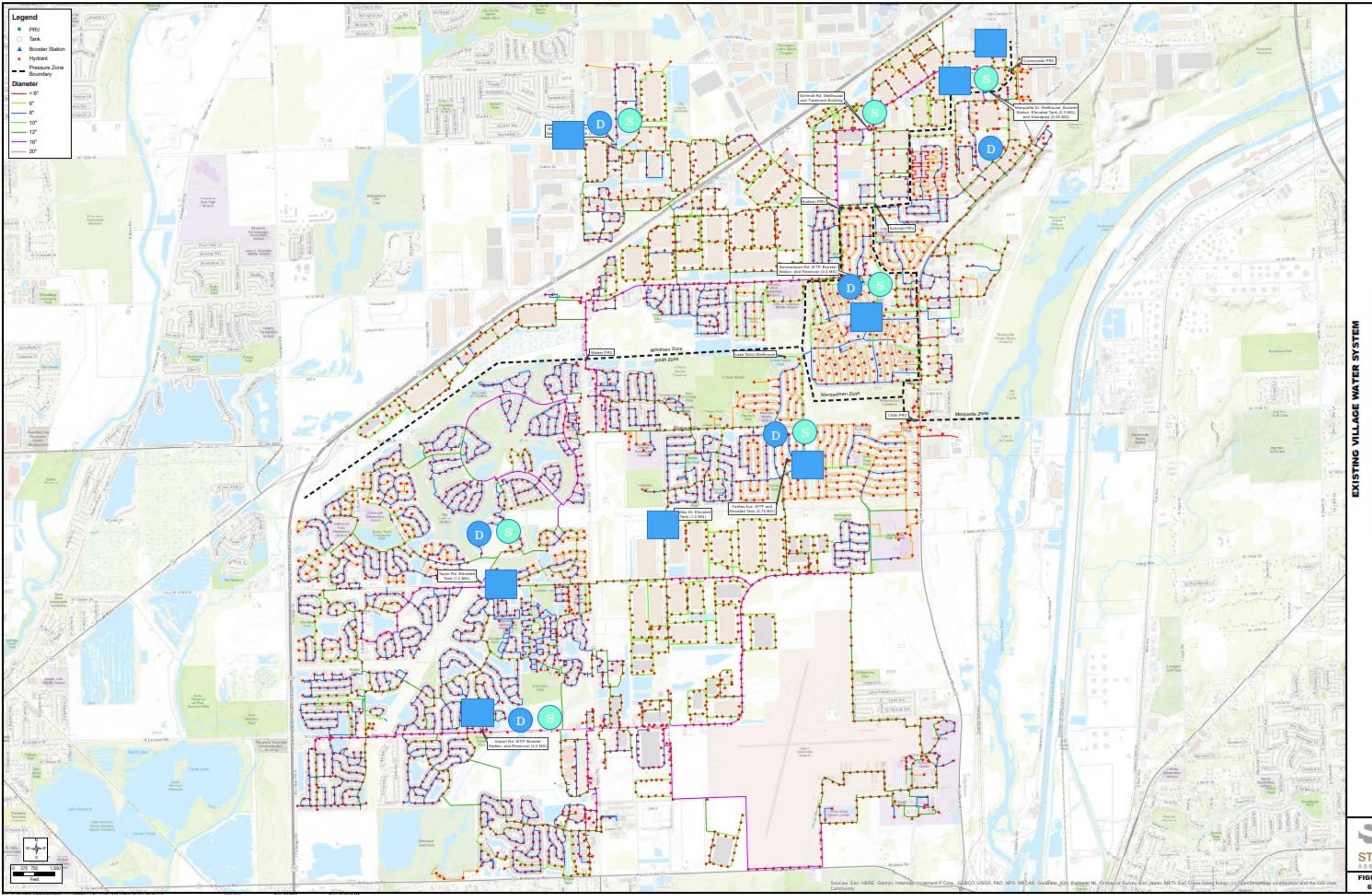


Open Discussion & Conversation

Current Water Demands/System

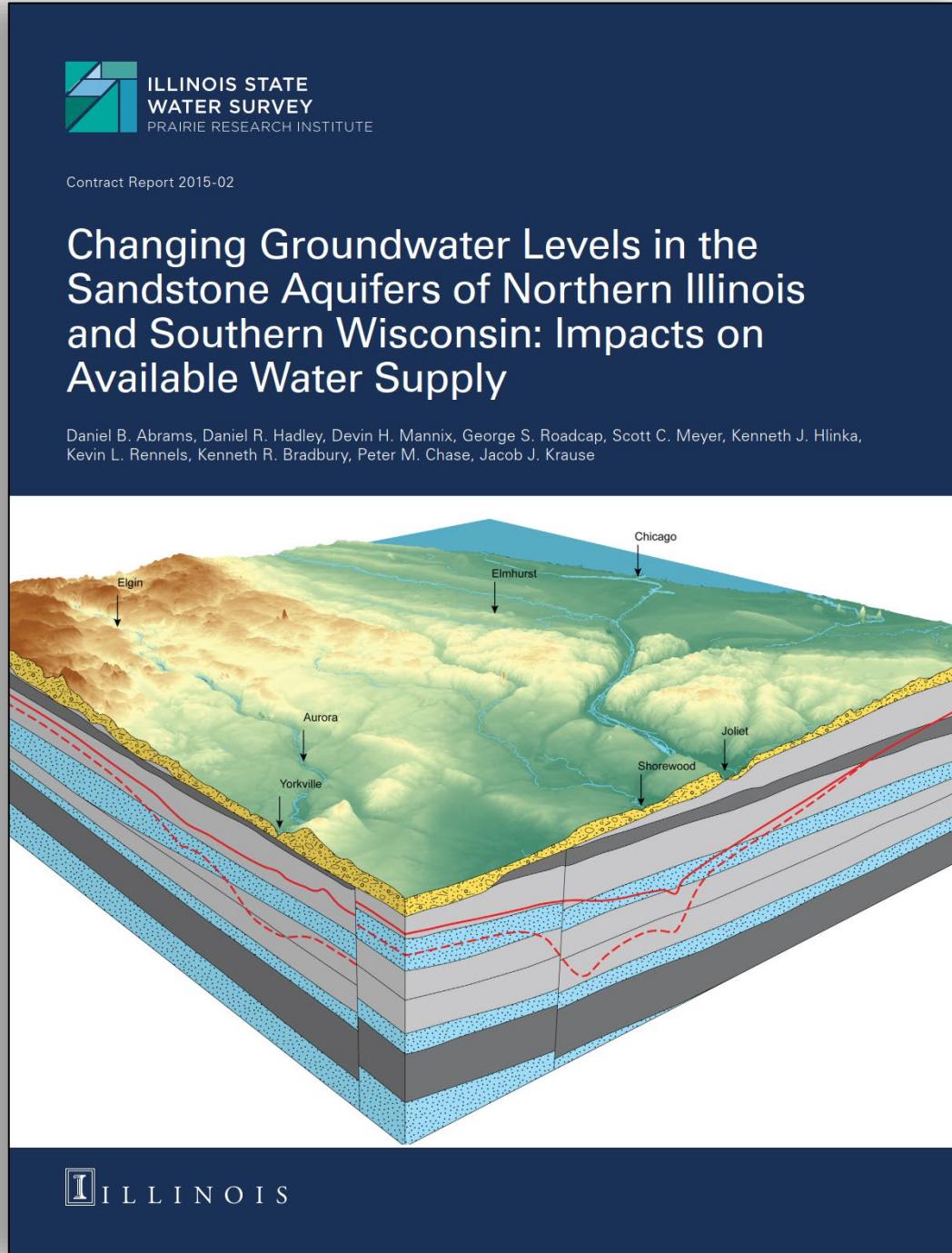
The Village of Romeoville has six deep wells (1,500 feet deep) and 7 shallow wells (between 150 to 300 feet deep) that pump water from underground aquifers which are the source of our drinking water.





Northern Illinois Ground Water Supply Study

Illinois State Water Survey (ISWS)



- Illinois State Water Survey – University of Illinois Program – Urbana Champaign studies the State's water resources.

"The University of Illinois' Illinois State Water Survey has been a leader in the study of water resources for more than a century. ISWS provides basic and applied scientific research, extensive expertise, and a wealth of objective data to benefit the people, economy, and environment of Illinois. ISWS is a division of the Prairie Research Institute (PRI)."

- Completed another round of study of the water resources in Northern Illinois in 2015, which included the creation of computerized models of the groundwater aquifers service the area.
- The model revealed reason for more concern than their past studies had shown.
- As a result, many of the area municipalities and industrial groundwater users commissioned and funded further research.

ISWS Refined Groundwater Modeling to Help Area Communities Better Understand the Risk

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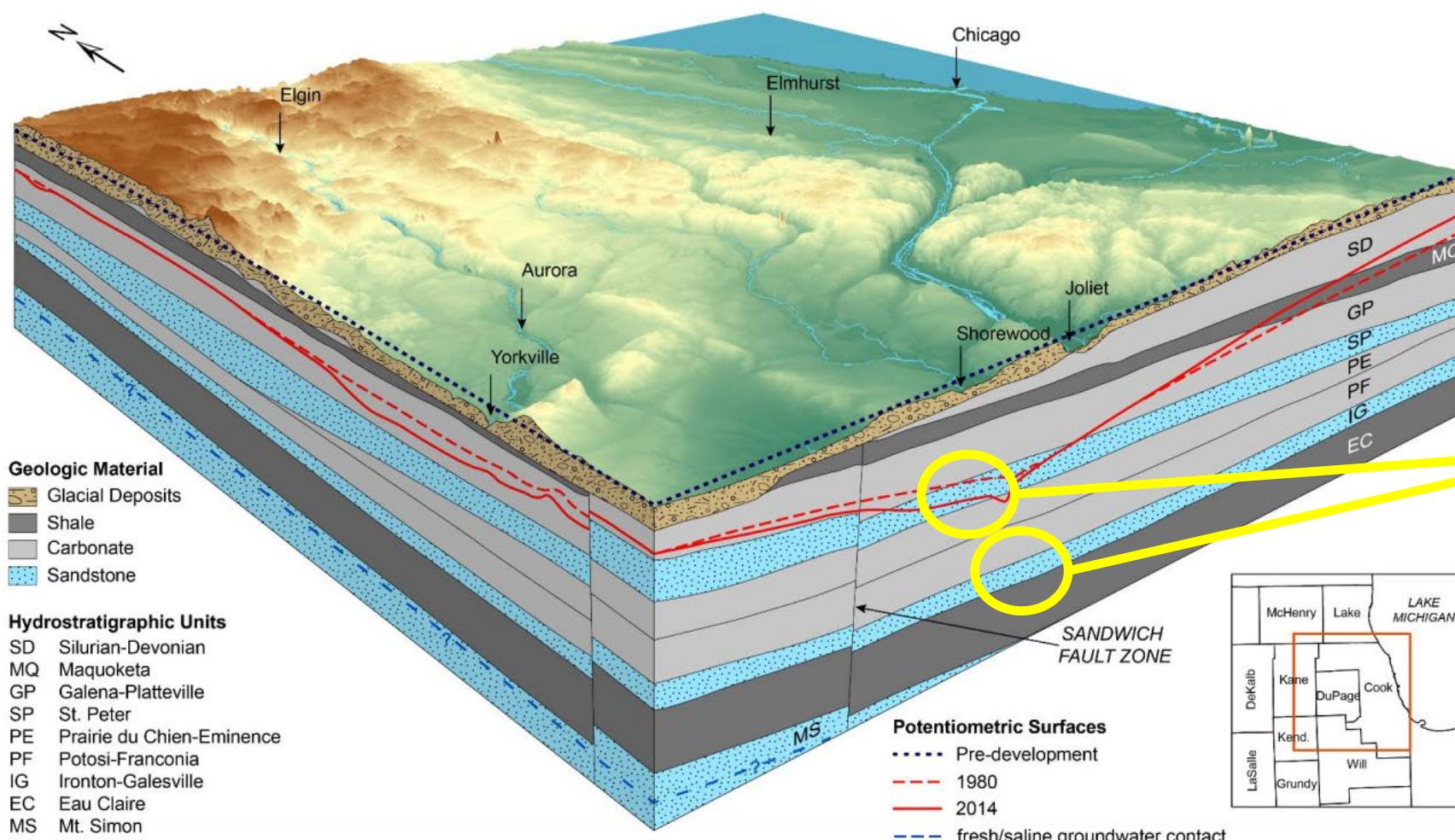


Figure 23: Potentiometric surface of the Cambrian-Ordovician sandstone aquifers for predevelopment, 1980, and 2014 in northeastern Illinois. The left cutaway runs through southern McHenry, Kane, and Kendall Counties. The right cutaway runs through Kendall, Will, and southern Cook Counties

- Collection of extensive mounts of data from wells and water users throughout the region
- Calibration of model to better reflect historic trends and potential growth
- Visual understanding of aquifer dewatering over time

Dewatering of the Deep Sandstone is Eminent According to ISWS Findings

Need to clarify where Romeoville is and what this is showing.

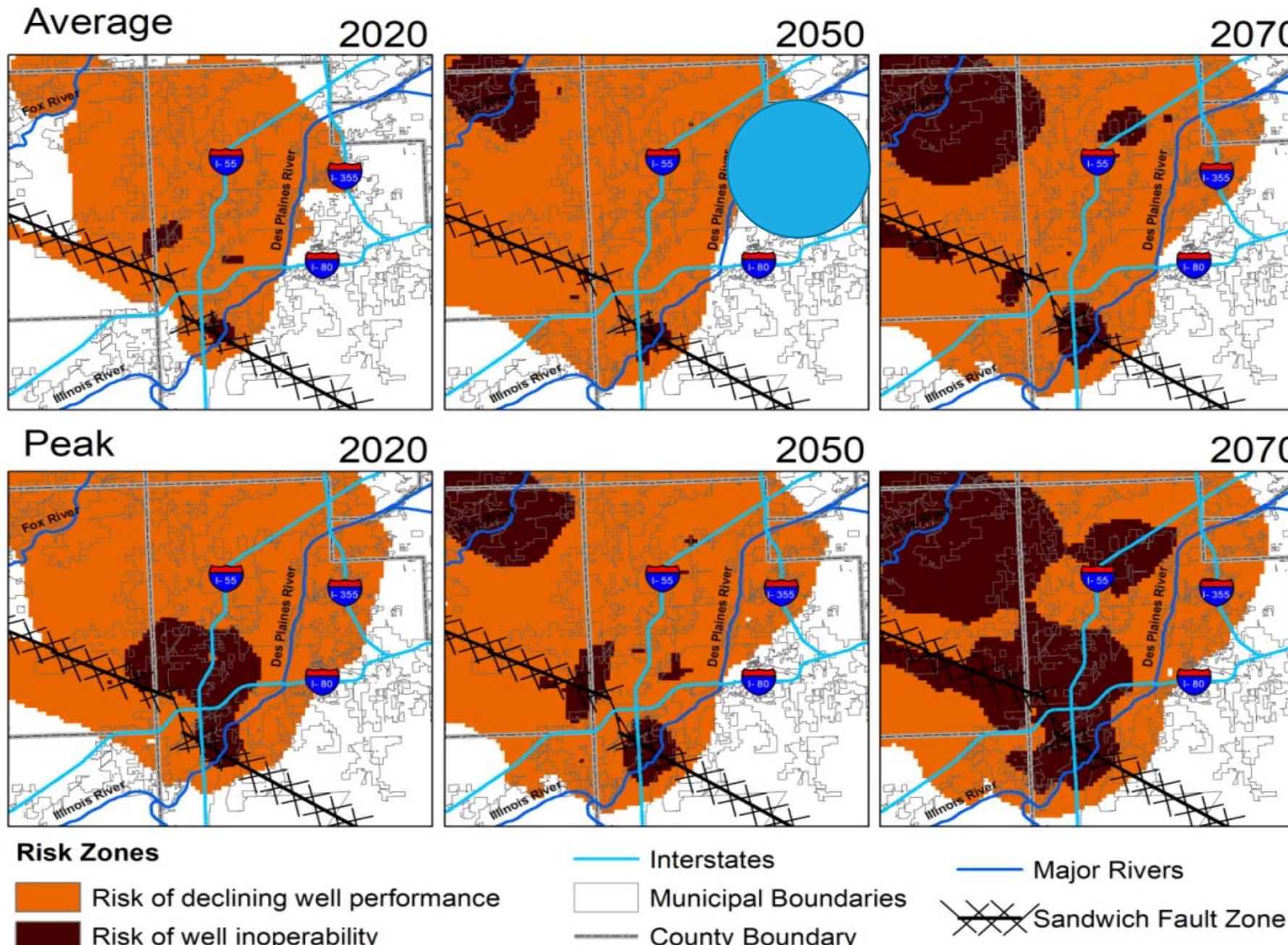


Figure 1. Risk associated with declining water levels in the deep sandstone aquifer in the Southwestern Suburbs of Chicago. The maps are for 2030, 2050, and 2070 during average (top row) and peak (bottom row) demands.

- Modeling included all current deep wells and communities projected additional deep wells, including Romeoville
- Modeling was performed with the assumption that Joliet will find an alternative source and cease withdrawals from the deep aquifer.
- Withdrawals from neighboring communities still resulted in issues as early as 2050. Joliet will need a change by 2030.

Illinois State Water Survey

- Under the current trend water levels in Romeoville will continue to decline and be at-risk of well inoperability. Additional future withdrawals beyond the current trend demands, such as a new sandstone water user, will exacerbate this risk.
- Romeoville's sandstone withdrawals are not sustainable. Future water level declines pose a risk to Romeoville's sandstone water supply, and Joliet switching off the aquifer will not eliminate this risk
- *Will Romeoville's withdrawals ever be sustainable?*
No. Withdrawals from the sandstone aquifer in the Southwestern Suburbs have been unsustainable for over a century. Sustainable withdrawals for the region are estimated to be only 2-7 MGD, which is exceeded by expected future industrial demand alone. Over the decades, the aquifer has slowly depleted and now many supply wells are threatened. If withdrawals continue to exceed sustainable supply, irreparable declines in water levels will occur, impacting the already limited timeline of availability for this water source.
- *How long can Romeoville meet needed supply from the sandstone?*
Planning based on a time-horizon of available water from an aquifer is very challenging due to how water levels are sensitive to minor changes in uncertain future demands. Risk increases as demands increase, with the first well entering the "Risk of Inoperability" zone under average conditions around 2070 for the Current Trend Scenario and 2053 with an additional 1.5 MGD. Wells would enter this risk zone immediately with an additional 3 MGD. No wells entered this most severe risk zone in the Less Resource Intensive Scenario. The issue is exacerbated when considering peak demands, where this most severe risk zone is reached 1-2 decades sooner. It is important that communities understand the impact of one or more wells going off-line, either for a short period (during peak conditions) or long-term (during average conditions), on their ability to meet total demands.

Add this to FAQ? Simplify – less text!

Add table with well by well risks and inoperability

Other Available Water Aquifer Presents Different Complications to Long Term Sustainability

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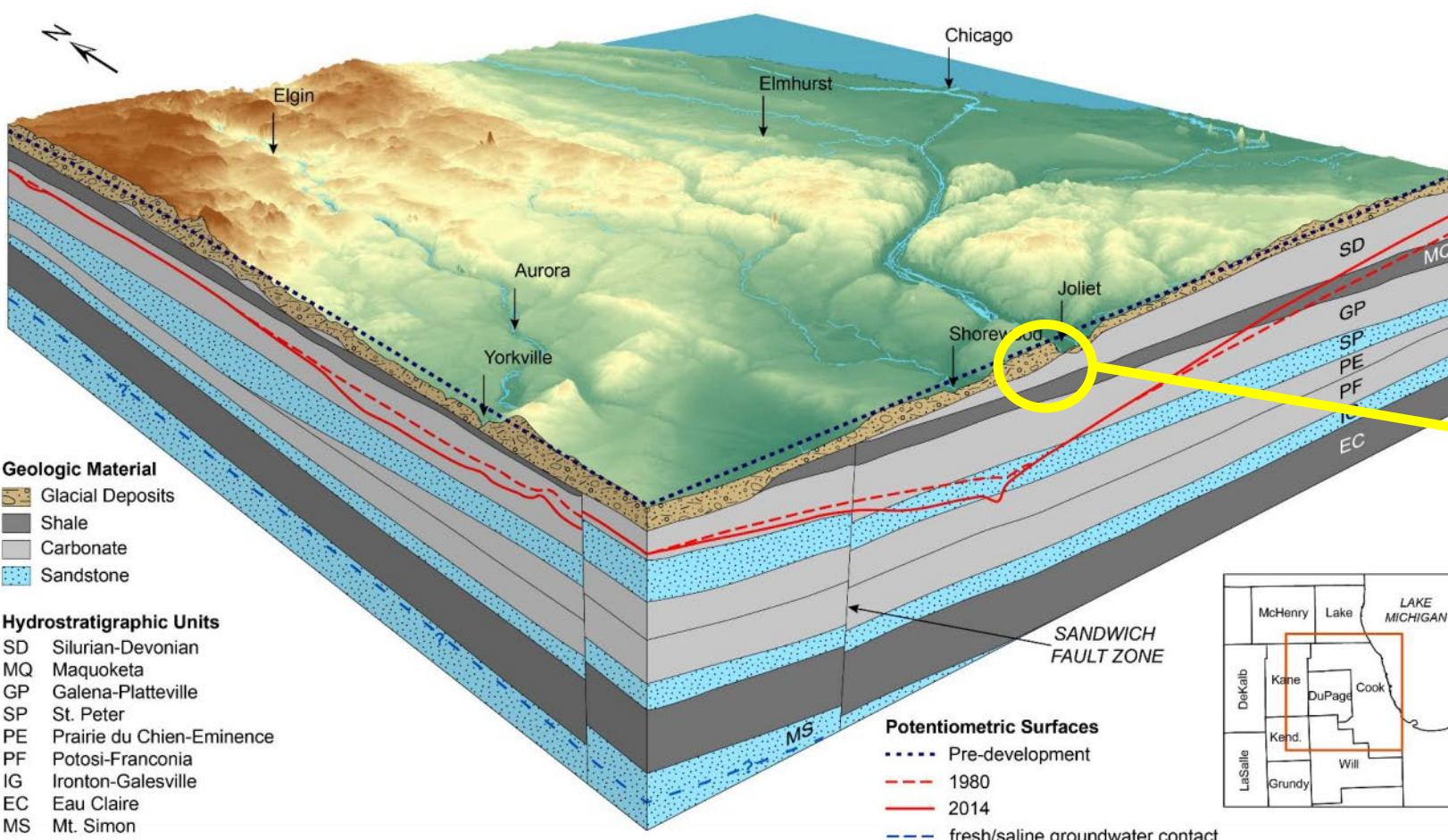


Figure 23: Potentiometric surface of the Cambrian-Ordovician sandstone aquifers for predevelopment, 1980, and 2014 in northeastern Illinois. The left cutaway runs through southern McHenry, Kane, and Kendall Counties. The right cutaway runs through Kendall, Will, and southern Cook Counties

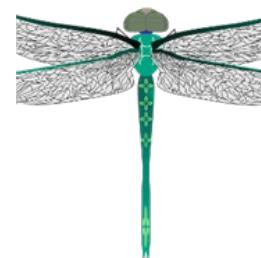
- Silurian Dolomite provides about 25% to 30% of the Village's current water supply
- ISWS investigated this aquifer through calibrated groundwater modeling
- Focus was on transport of contamination from surface runoff

Shallow Aquifer Source Not a Reliable or Sustainable Alternative



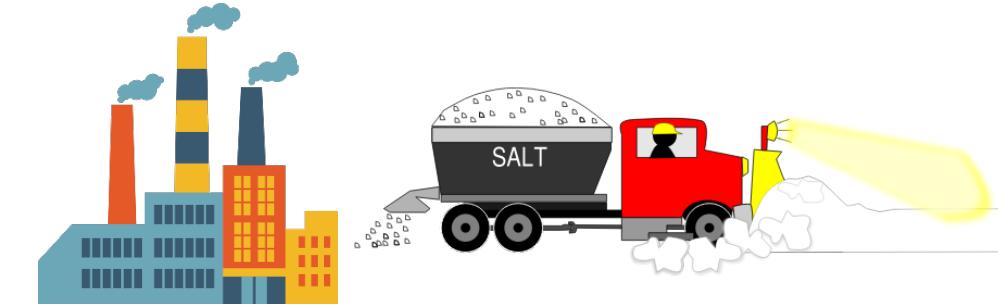
Unpredictable Capacity

Production is dependent on finding high fracture zones, which can be problematic.



Current Minor Obstacles:

Environmental impacts limiting available areas for future wells.



Possible Major Future Obstacles:

Elevated Chloride Levels Due to salting and industrial contamination.

Polyfluoroalkyl substances (PFAS).

Larger Font and clarify

Emerging or unknown?

Current Lake Michigan vs groundwater with indication of who is supplying

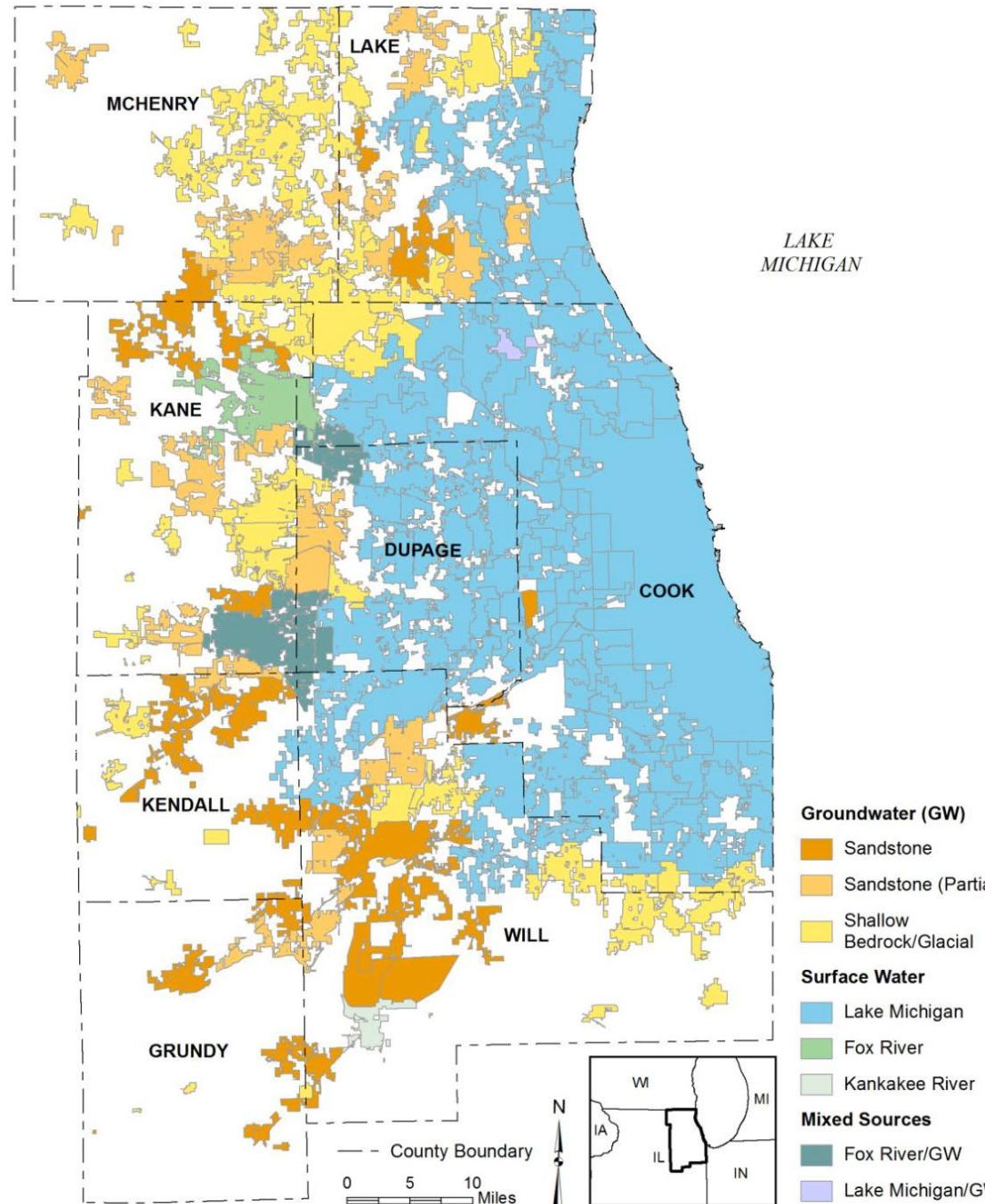


Figure 7: Source of municipal water used by each community in northeastern Illinois as of 2014.

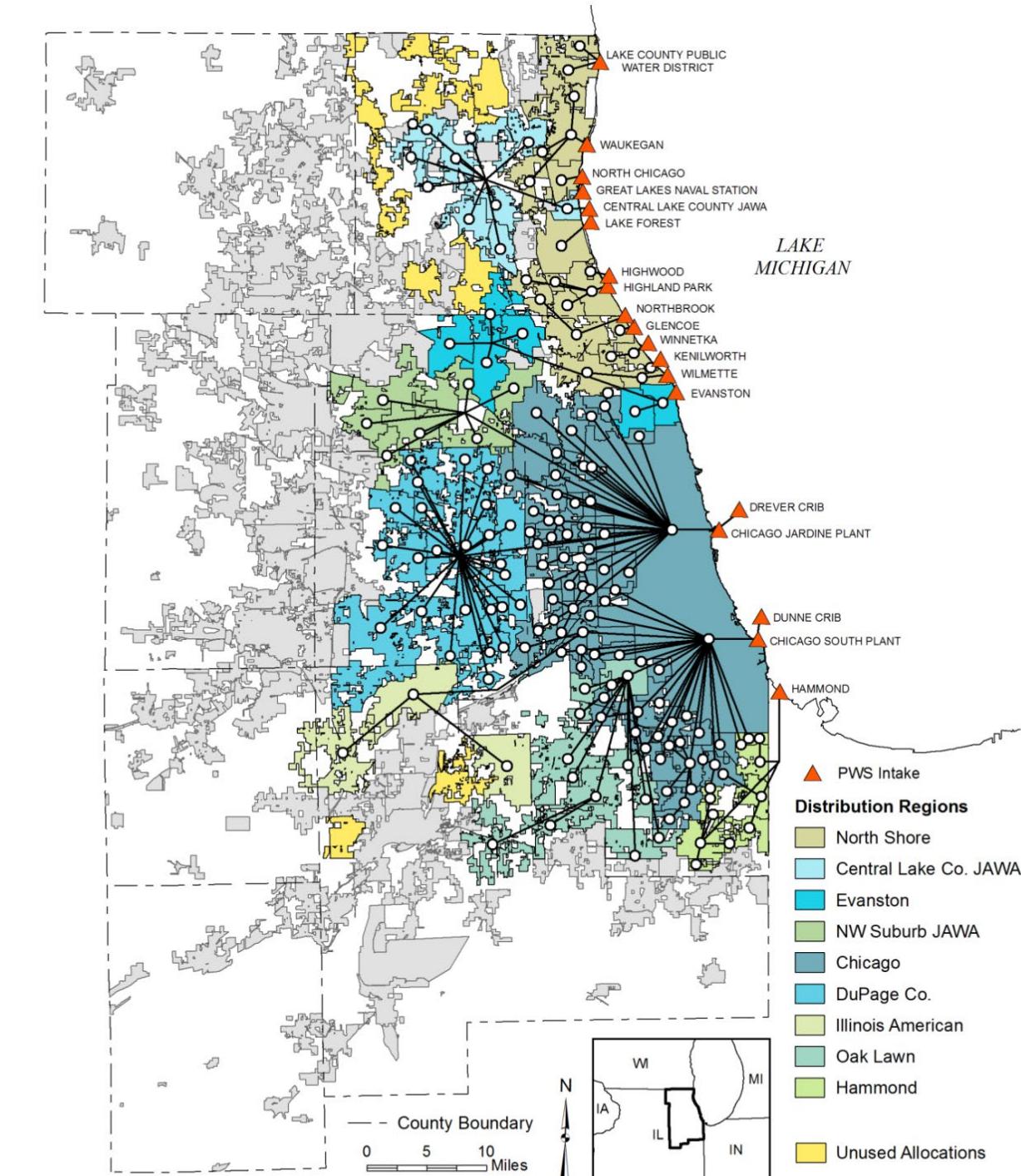
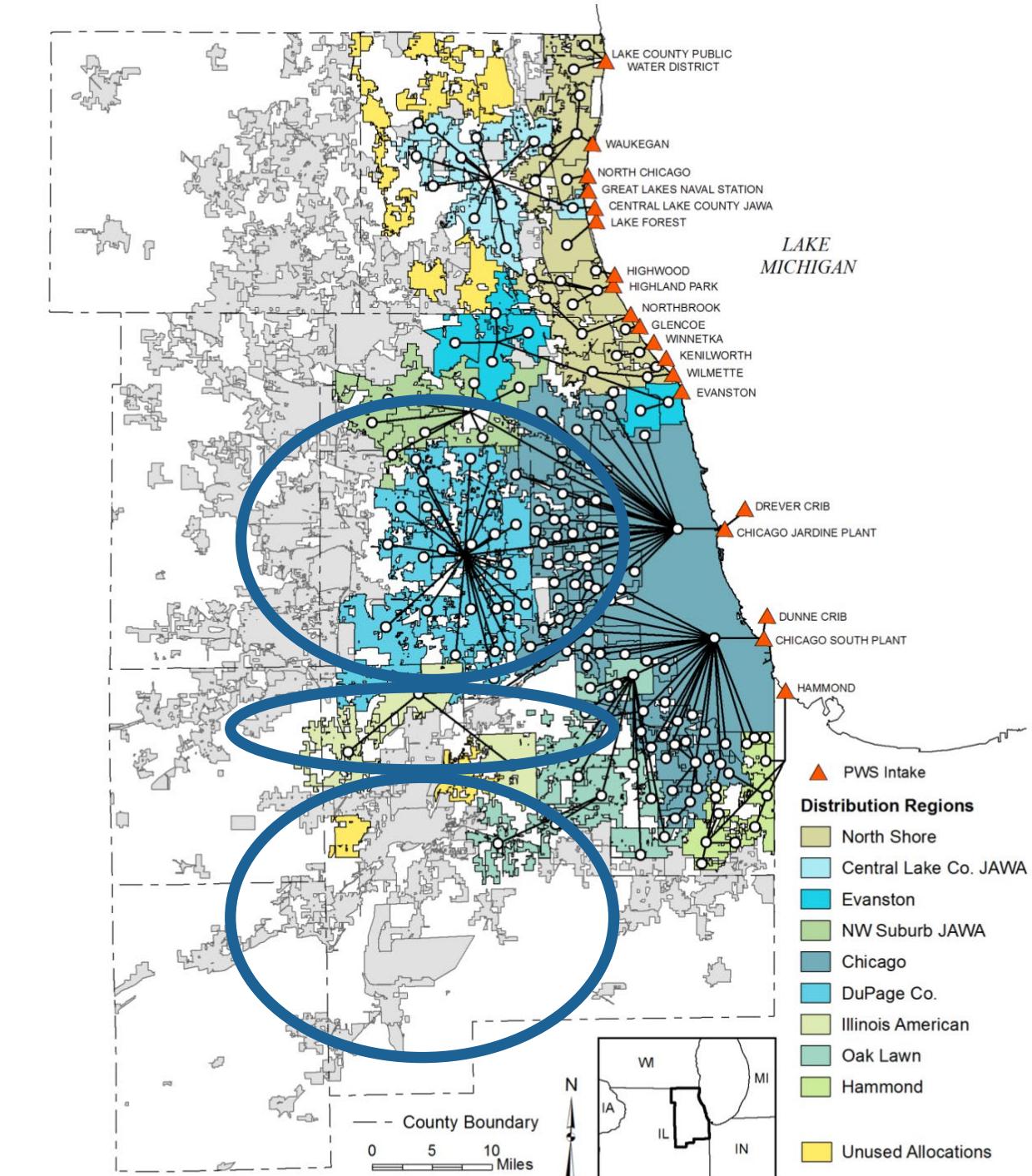
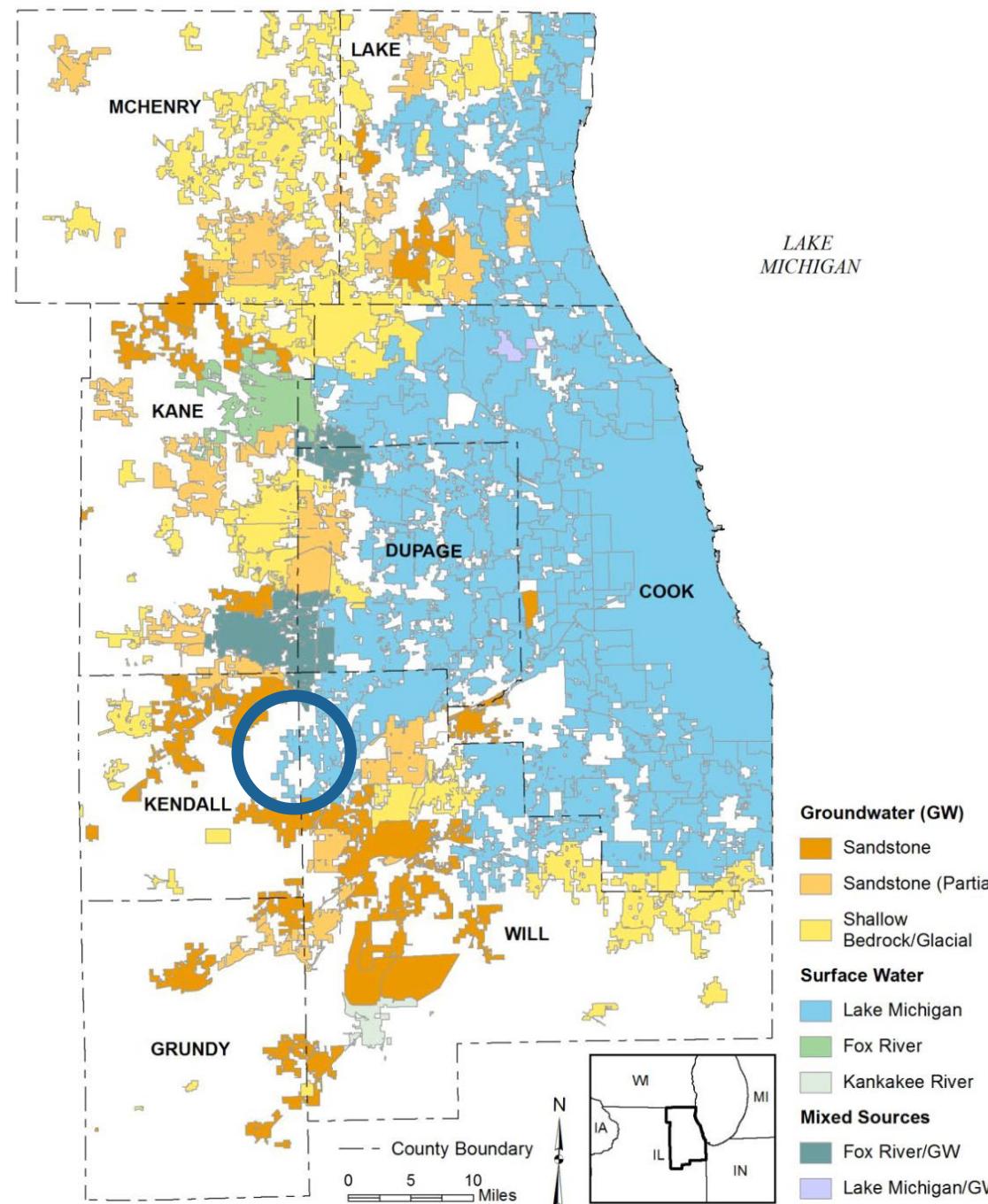


Figure 58: Lake Michigan water distribution network in northeastern Illinois for 2012. Connecting lines are illustrative and do not represent the physical pipelines.

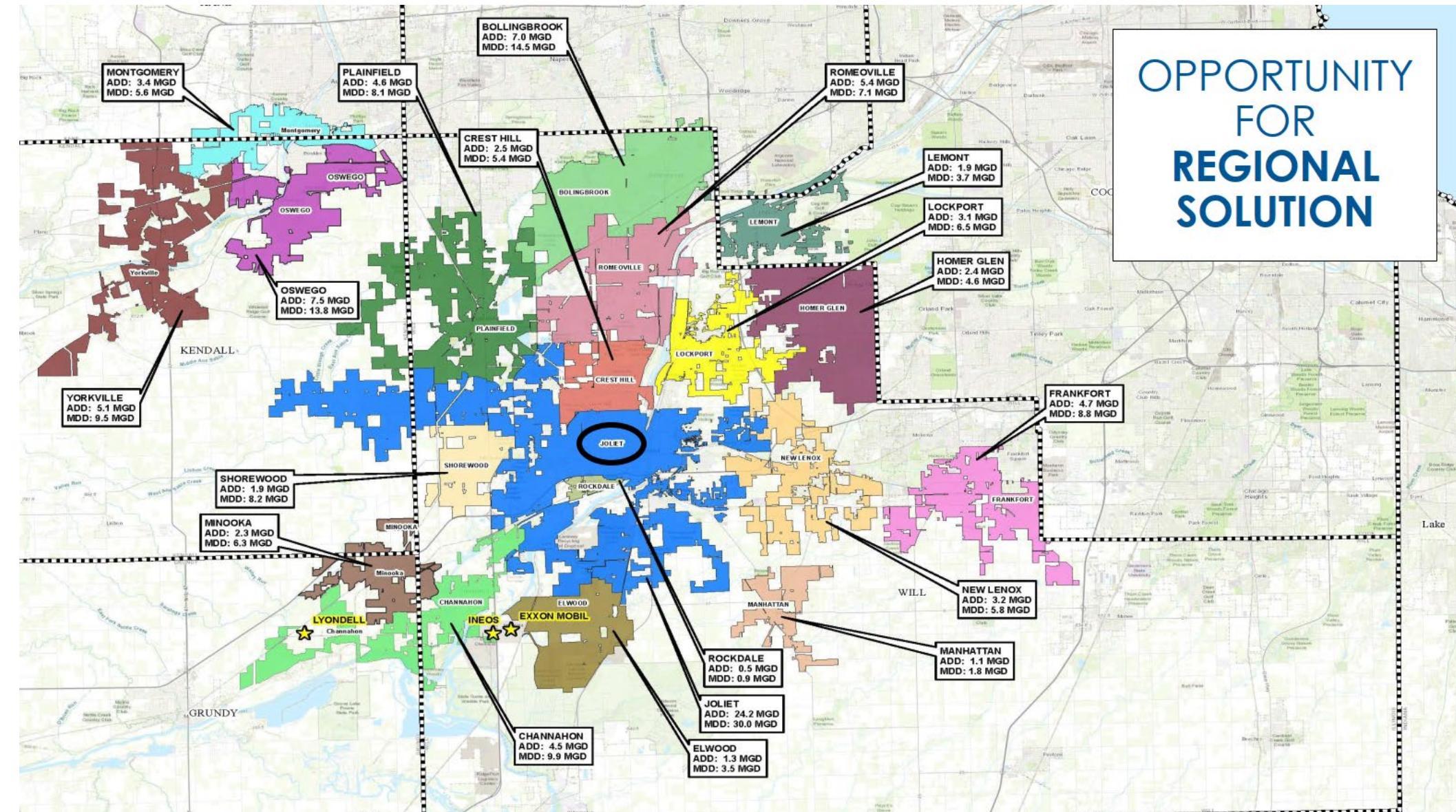
Current Lake Michigan vs groundwater with indication of who is supplying



Several Other Affected Communities are Also Investigating Options

City of Joliet created a pathway to bring Lake Michigan water to the area as a Regional Solution, so many communities investigated their options, including:

- Joliet
 - Bolingbrook
 - Channahon
 - Crest Hill
 - Elwood
 - Homer Glen
 - Lemont
 - Lockport
 - Manhattan
 - Montgomery
 - Minooka
 - New Lenox
 - Oswego
 - Rockdale
 - Romeoville
 - Shorewood
 - Yorkville
 - Area Industry



Currently, potential partners with the City of Joliet include, Channahon, Crest Hill, Lemont, Minooka, Rockdale, Romeoville, and Shorewood.

City of Joliet Studies Many Alternatives and Commits to Lake Michigan Water

Phase 1 Study:

Groundwater Source

- Mt. Simon Aquifer
- Aquifer Storage and Recharge

River Water Source

- Kankakee River
- Illinois River
- Des Plaines River
- Fox River

Lake Michigan Water Source

- City of Chicago
- DuPage Water Commission
- Southland Water Commission
- Illinois American Water Company
- Oak Lawn

Phase 2 Study:

River Water Source

- Kankakee River
- Illinois River

Lake Michigan Water Source

- City of Chicago
- DuPage Water Commission
- Southland Water Commission

Final Study:

Lake Michigan Water Source

- Purchase from City of Chicago
- Construct Intake in Hammond

Final Selection

Lake Michigan via City of Chicago BY 2030

Village Also Performed a Comprehensive Study of Multiple Alternatives

PHASE 1

Groundwater Source

- Shallow Aquifer Treatment

River Water Source

- Kankakee River
- Illinois River
- Des Plaines River

Lake Michigan Water Source

- City of Chicago directly
- DuPage Water Commission
- Regional Water Commission – Indiana Intake
- Regional Water Commission – City of Chicago
- Illinois American Water Company



PHASE 2

Lake Michigan Water Source

- DuPage Water Commission
- Regional Water Commission – City of Chicago
- Illinois American Water Company



FINAL

Lake Michigan Water Source

- DuPage Water Commission
- Regional Water Commission – City of Chicago

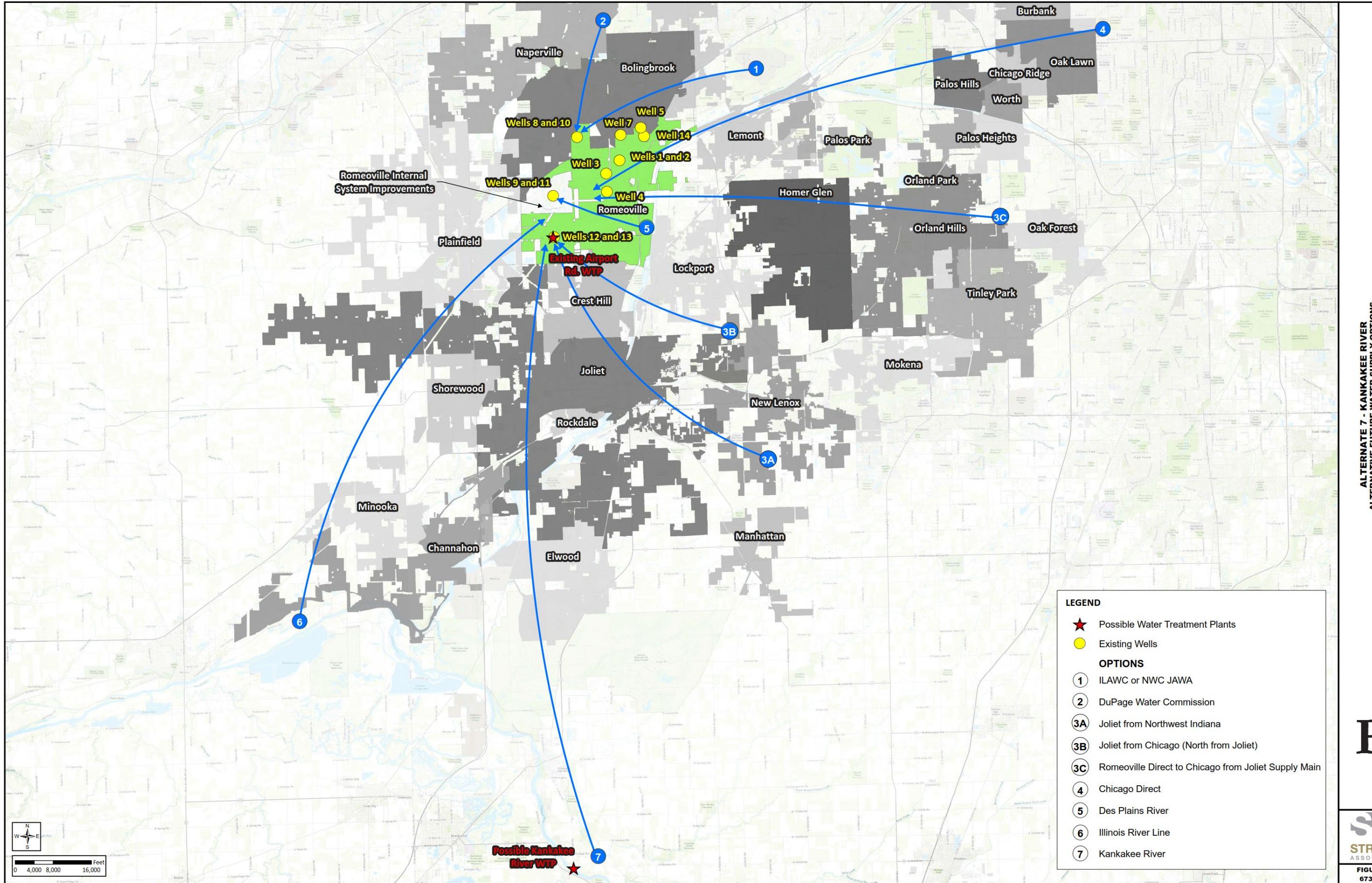
Benefits of Lake Michigan Water

PHASE 1 ANALYSIS

PHASE 1 ALTERNATIVES

- Lake Michigan Water - DuPage Water Commission
- Lake Michigan Water – Regional Water Commission (Joliet) – From Chicago
- Lake Michigan Water - Regional Water Commission (Joliet) – From Indiana
(eliminated)
- Lake Michigan Water- Chicago Direct
- Lake Michigan - Northern Will County Water Agency or Illinois American Water Company
- Des Plaines River
- Illinois River – Marseilles Pool
- Kankakee River

PHASE 1



PHASE 1

CONSIDERATIONS FOR ALTERNATIVE EVALUATION

Alternative water sources have been evaluated for their ability to provide sufficient water quantity and water quality to serve the Village of Romeoville for many years to come.

Staff has been identifying viable options for a long-term water supply solution for the Village and will make a recommendation in November on optimal options to pursue further. The following was considered when researching alternate solutions.

- Cost
- Raw water quality
- Sustainability/water quantity
- Implementation risk
- Operation & maintenance
- Control (governance)

COMPARISON OF PHASE 1 ALTERNATIVES

	ALTERNATIVE	CONCEPTUAL COST	RAW WATER QUALITY	SUSTAINABILITY	IMPLEMENTATION RISK	OPERATION AND MAINTENANCE	CONTROL (GOVERNANCE)
LAKE MICHIGAN	DUPAGE WATER COMMISSION	+	+	+	+	+	O
	REGIONAL WATER COMMISSION	+	+	+	+	+	O
	ILAWC / NWCWA	+	+	+	O	+	O
	CITY OF CHICAGO	-	+	+	O	+	O
RIVER	DES PLAINES RIVER	O	-	O	-	-	+
	ILLINOIS RIVER MARSEILLES POOL	-	O	O	-	-	+
	KANKAKEE RIVER	-	O	-	O	-	+

PHASE 1

COMPARISON OF PHASE 1 ALTERNATIVES

	ALTERNATIVE	CONCEPTUAL COST	RAW WATER QUALITY	SUSTAINABILITY	IMPLEMENTATION RISK	OPERATION AND MAINTENANCE	CONTROL (GOVERNANCE)
LAKE MICHIGAN	DUPAGE WATER COMMISSION	+	+	+	+	+	O
	REGIONAL WATER COMMISSION	+	<p>All River Options Were Eliminated:</p> <ul style="list-style-type: none"> Cost were very unfavorable in comparison Raw Water Quality was very poor and variable Less sustainable than Lake Michigan Environmental factors, water quality, and feasibility added high levels of risk. Water Treatment added significant Operation and Maintenance effort and costs. 				
	ILAWC / NWCWA	+					O
	CITY OF CHICAGO	-					O
RIVER	DES PLAINES RIVER						+
	ILLINOIS RIVER MARSEILLES POOL						+
	KANKAKEE RIVER						+

PHASE 1

COMPARISON OF PHASE 1 ALTERNATIVES

	ALTERNATIVE	CONCEPTUAL COST	RAW WATER QUALITY	SUSTAINABILITY	IMPLEMENTATION RISK	OPERATION AND MAINTENANCE	CONTROL (GOVERNANCE)
LAKE MICHIGAN	DUPAGE WATER COMMISSION	+	+	+	+	+	O
	REGIONAL WATER COMMISSION	+	+	+	+	+	O
	ILAWC / NWCWA	+	+	+	O	+	O
	CITY OF CHICAGO	-	+	+	O	+	O
RIVER	DES PLAINES RIVER						+
	ILLINOIS RIVER MARSEILLES POOL						+
	KANKAKEE RIVER						+

Direct Connection to City of Chicago Eliminated:

- Cost were very unfavorable in comparison
- Lengthy water transmission main and high number of other municipalities impacted added moderate levels of risk.
- Lengthy water transmission main outside of Village limits added some, minor additional operation and maintenance concerns.

PHASE 1

COMPARISON OF PHASE 1 ALTERNATIVES

	ALTERNATIVE	CONCEPTUAL COST	RAW WATER QUALITY	SUSTAINABILITY	IMPLEMENTATION RISK	OPERATION AND MAINTENANCE	CONTROL (GOVERNANCE)
LAKE MICHIGAN	DUPAGE WATER COMMISSION	+	+	+	+	+	O
	REGIONAL WATER COMMISSION	+	+	+	+	+	O
	ILAWC / NWCWA	+	+	+	O	+	O
	CITY OF CHICAGO	-	+	+	O	+	O
RIVER	DES PLAINES RIVER	O	-	O	-	-	+
	ILLINOIS RIVER MARSEILLES POOL	-	O	O	-	-	+
	KANKAKEE RIVER	-	O	-	O	-	+

PHASE 1

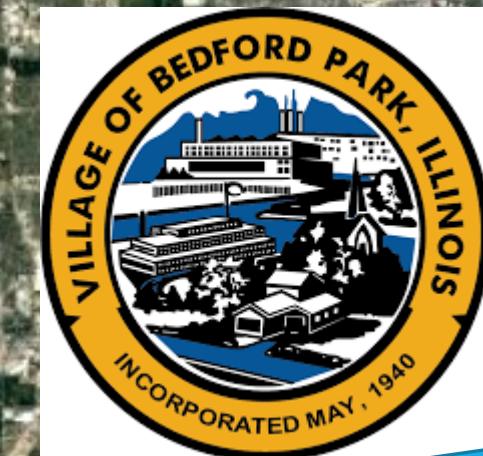
PHASE 2 ANALYSIS

PHASE 2 ALTERNATIVES

- Lake Michigan Water - Illinois American Water Company
- Lake Michigan Water - DuPage Water Commission
- Lake Michigan Water - Regional Water Commission

PHASE 2

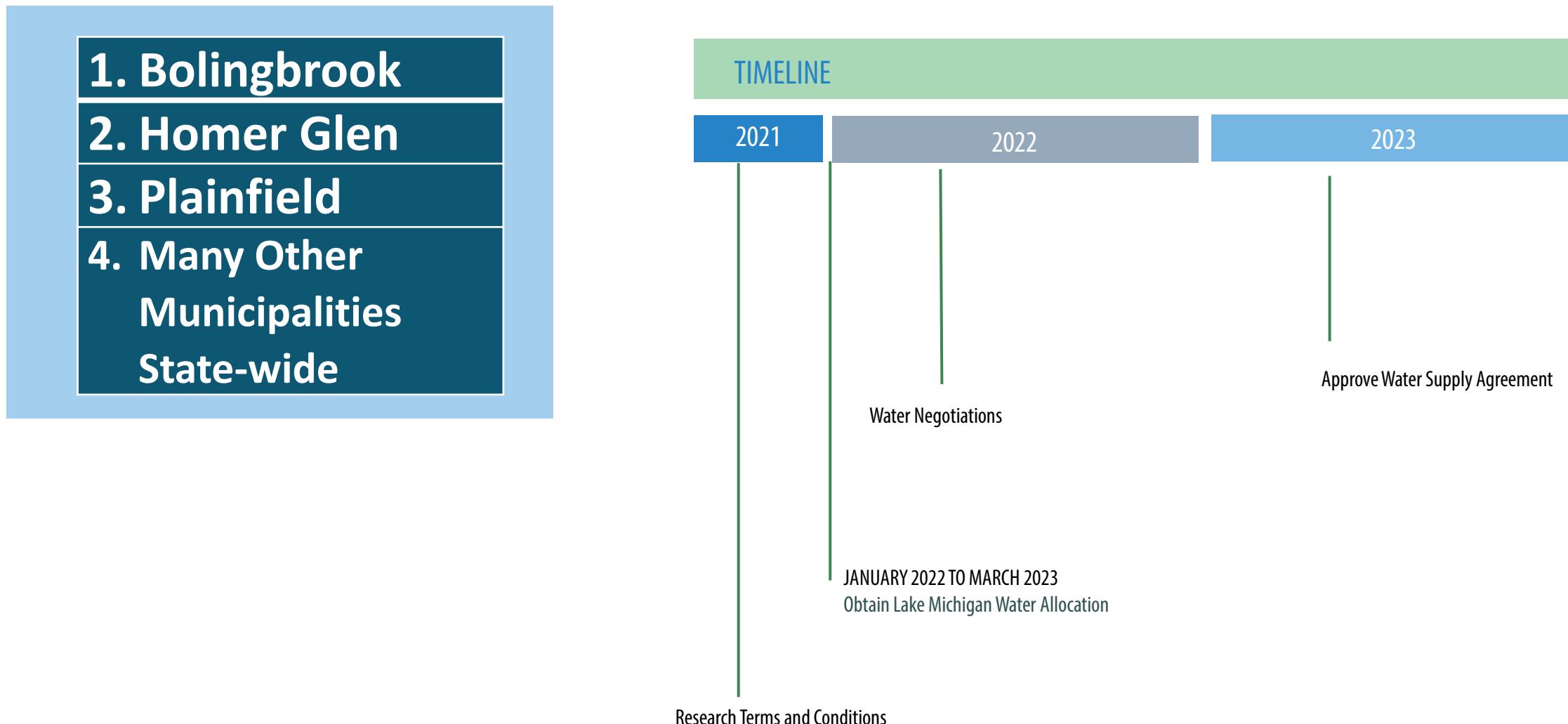
Lake Michigan Via Illinois American Water Company



PHASE 2



Illinois American Water Timeline



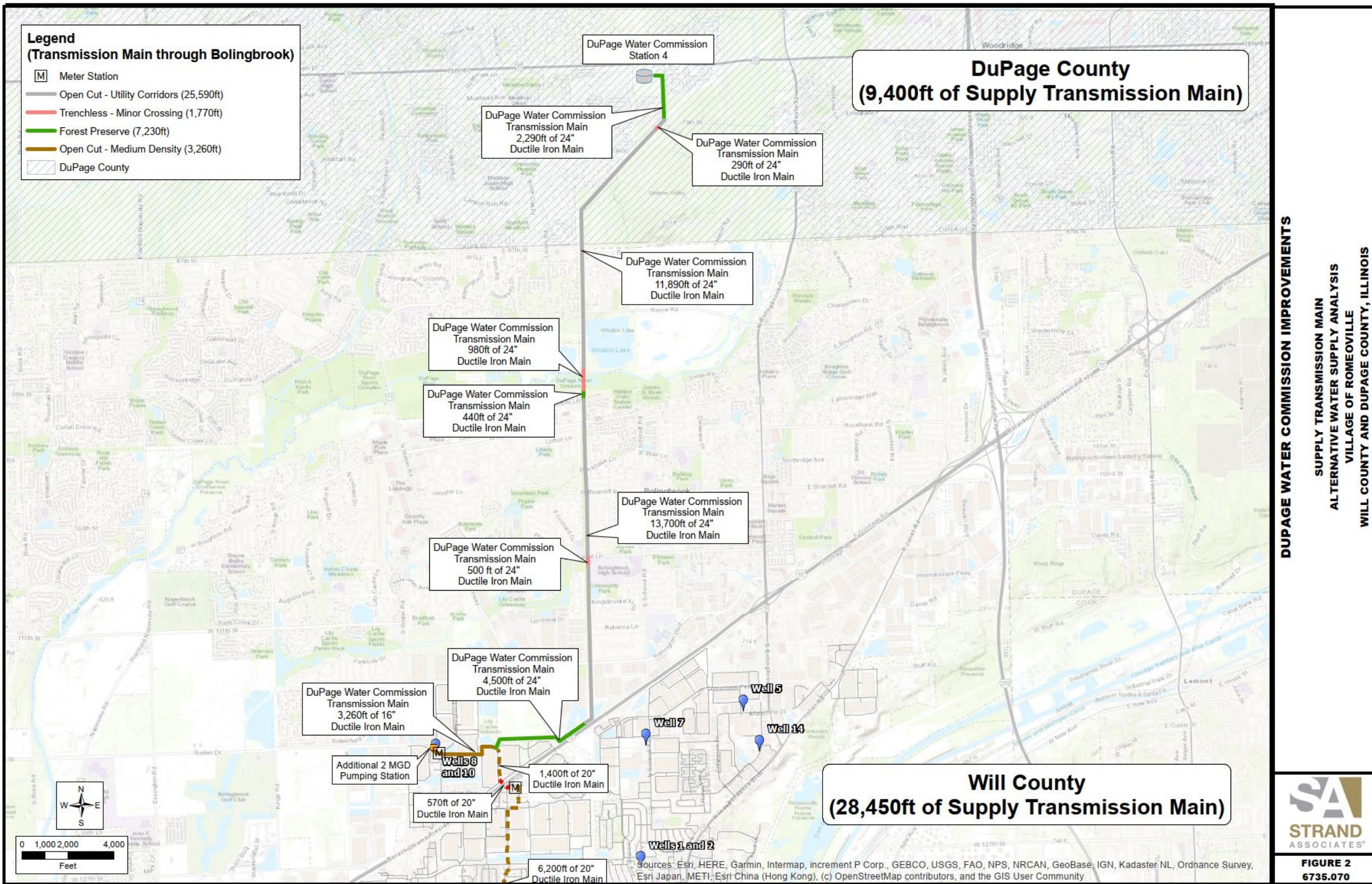
PHASE 2

Lake Michigan Via DuPage Water Commission



PHASE 2

LAKE MICHIGAN WATER VIA DUPAGE WATER COMMISSION

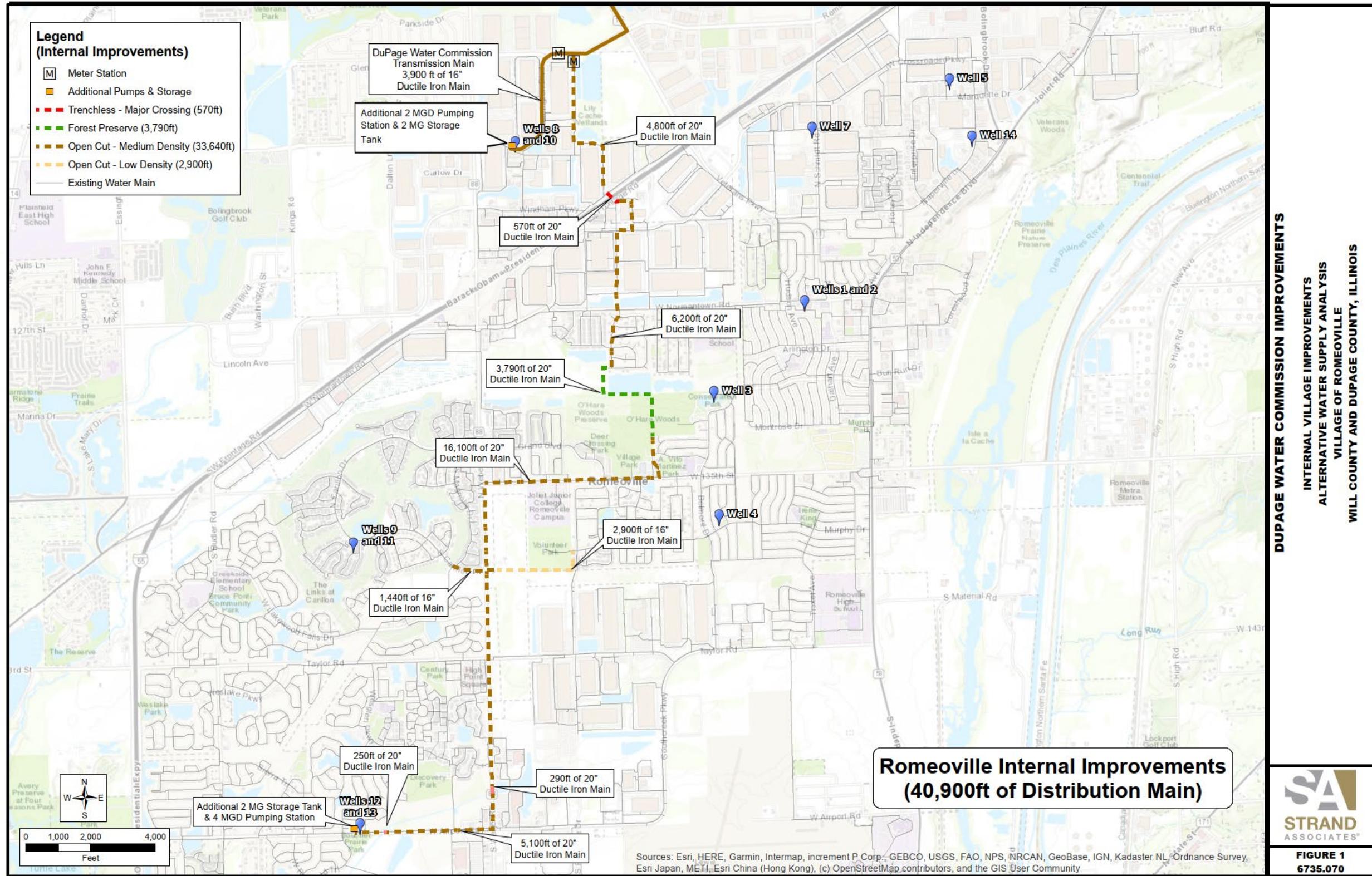


Village of
Romeoville
 Where Community Matters

SA
STRAND
ASSOCIATES[®]

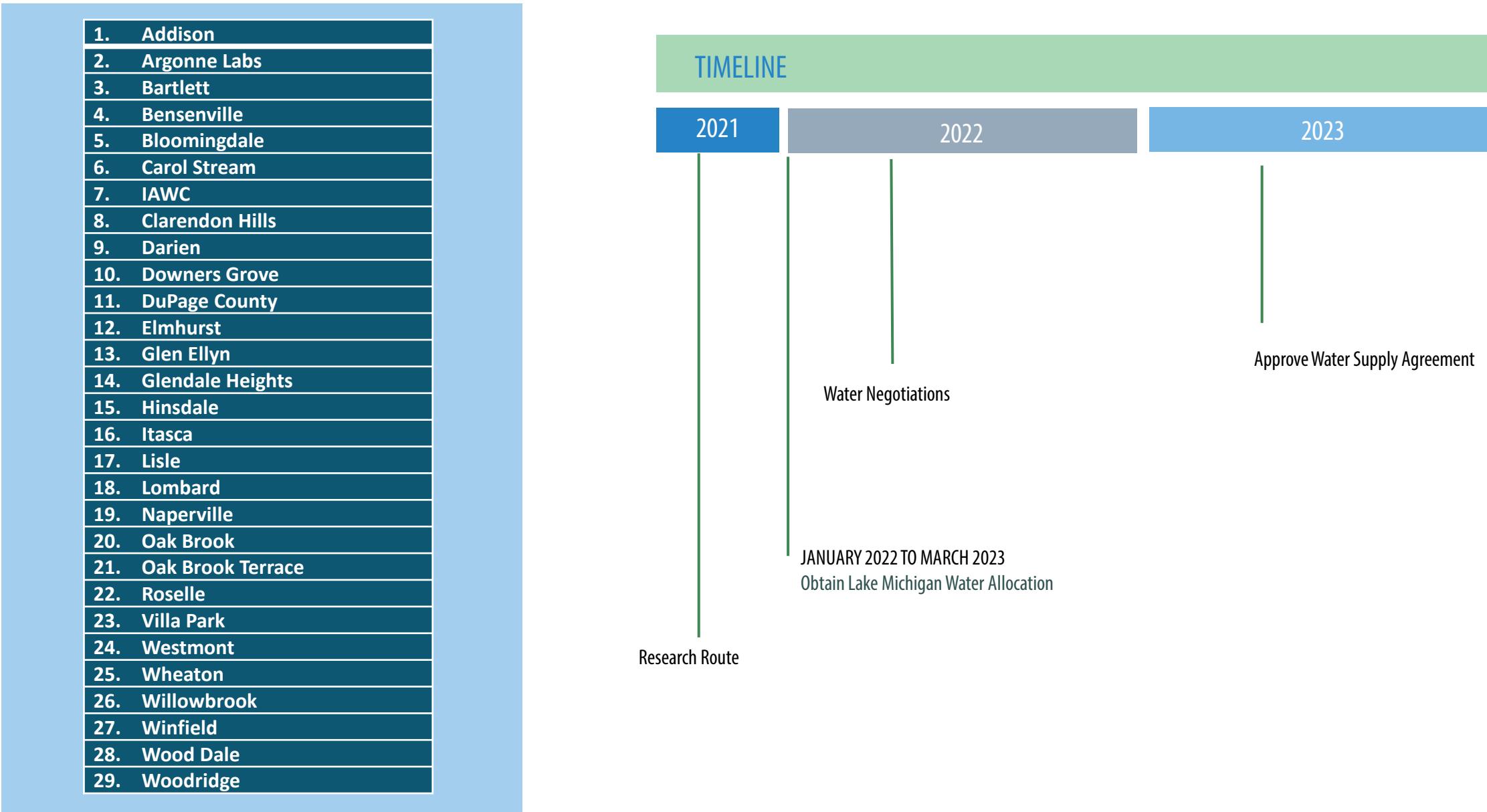
FIGURE 2
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LAKE MICHIGAN WATER VIA DUPAGE WATER COMMISSION



PHASE 2

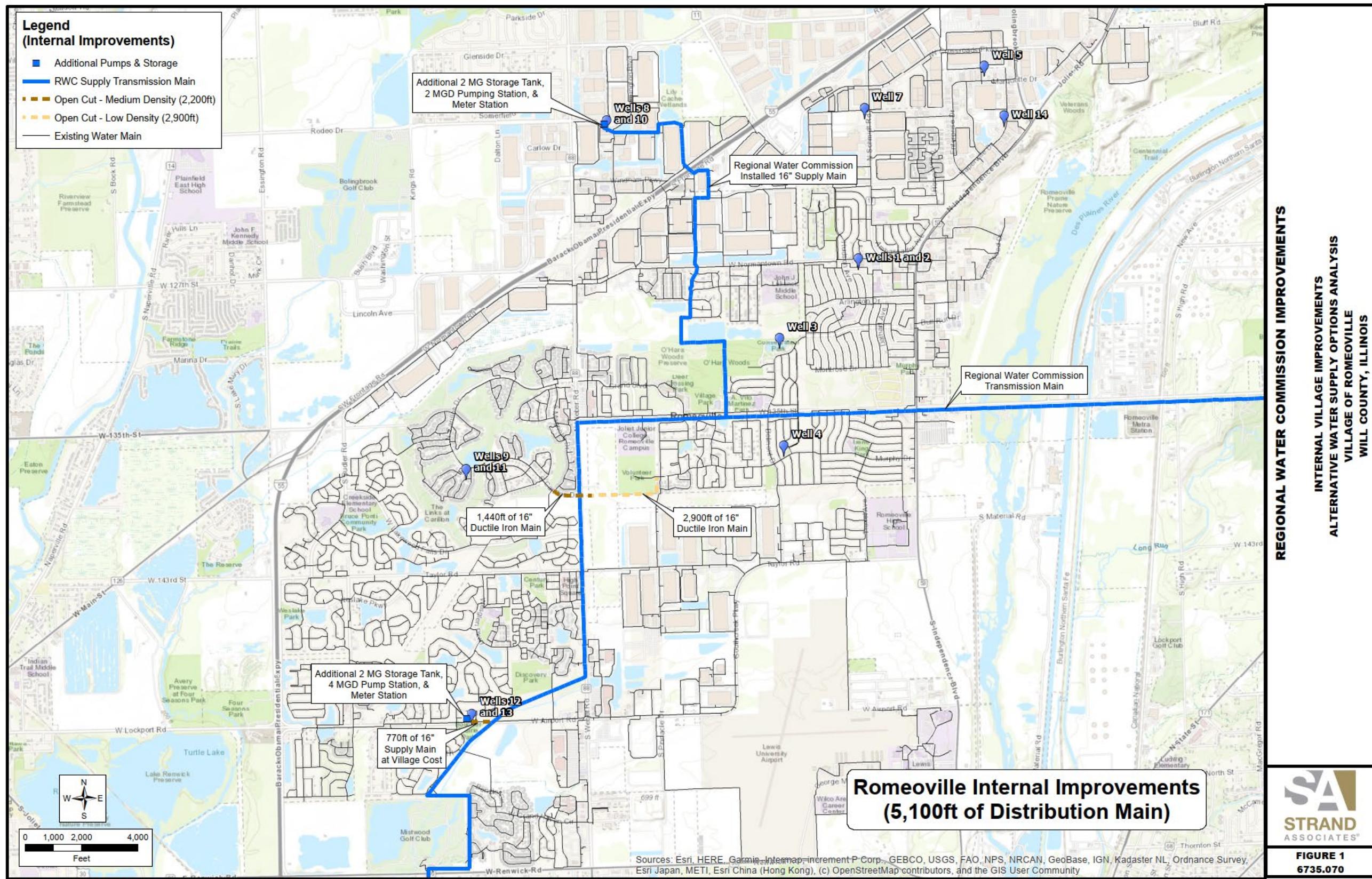
A REGIONAL SOLUTION: DuPage Timeline



Lake Michigan Via Regional Water Commission



LAKE MICHIGAN WATER VIA REGIONAL WATER COMMISSION



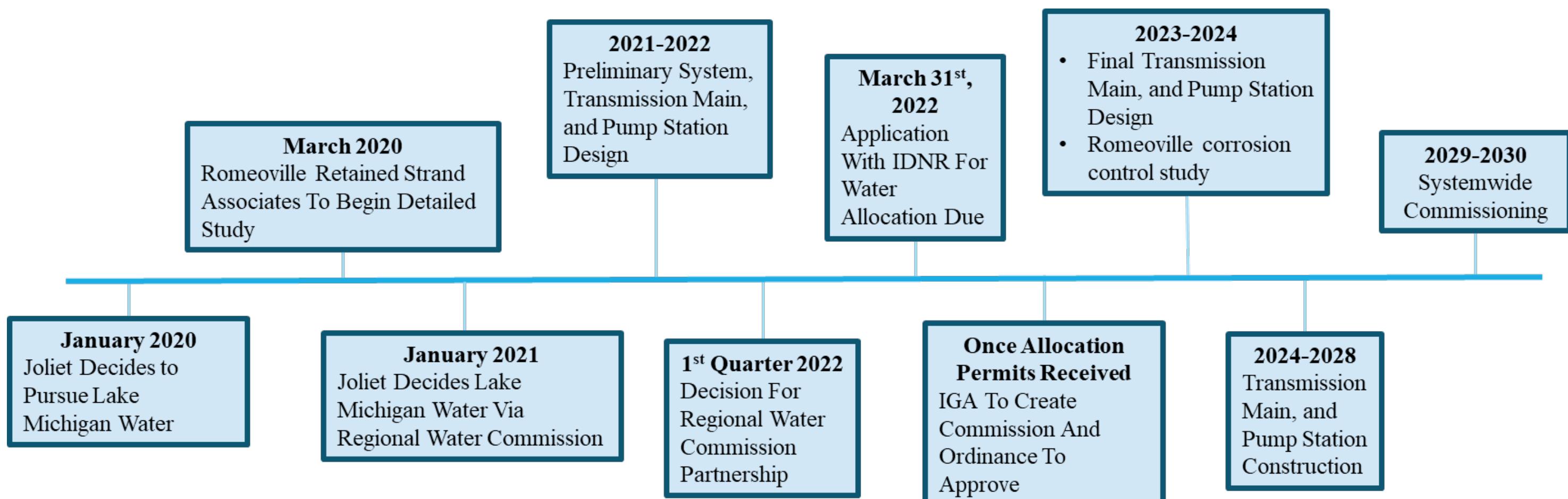
PHASE 2

Near Term Timeline for Lake Michigan Via RWC



PHASE 2

Long Term Timeline for Lake Michigan Via RWC



PHASE 2

CONSIDERATIONS FOR FINAL ALTERNATIVE EVALUATION – PROS & CONS AND COST ANALYSIS

DuPage Water Commission

Regional Water Commission

All other evaluation criteria were very similar between these two options. Phase 2 provided a more detailed cost analysis for comparison and conclusions.

FINAL

Comparison of Alternatives Pros

RWC

- Supply Transmission Main Runs Through Village and Minimizes Internal System Improvements
- Wholesale Purchase Rate is Transparent and Very Cost Advantageous
- Village participation in Forming of Commission and Terms and Conditions
- Higher Voting Authority
- Beginning of Supply rather than End of the Line
- Construction Managed by Others
- Potential for Advantageous Funding Opportunities

DWC

- Small Capital Improvement Costs based on 1980's construction dollars
- 45+ Years of Continuous Operation and Governance
- Redundant Lines from Chicago
- New Supply Infrastructure Only Water Mains, no Complex New Infrastructure Needed
- Less Unknowns

FINAL

Comparison of Alternatives Cons

RWC

- Single Supply Connection
- More Potential for Construction Cost Increases and Unforeseen Issues
- No Proven Operating Track Record

DWC

- Supply Main Routing outside of DuPage County presents potential obstacles
- Current Wholesale Rate is Higher
- Other Municipalities may Be Competing for Current Available Capacity
- Less Voting Power – Almost Customer Status
- No Authority to Modify Purchase Agreement
- Village at the end of the Supply System
- Village Must Manage and Lead the Supply Main Construction Efforts
- Several Extensive Internal Improvements Are Needed

FINAL



Open Discussion, Question & Answers



THANK YOU!
