Village of Channahon

Preliminary Alternative Water Source Study

Presentation Overview – October 26, 2021 Presentation

- Current Water Demands and Future Water Demand Projections - Review
- Alternative Analysis
- Comparison of Conceptual Cost
- Timeline and Next Steps

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Water Demand and Population Equivalent (PE) Projections
W/ Far West Growth Included

Projected PE & Water Use Data

Year	Total Projected PE	West Zone Projected Average Day Demand (MGD)	High/Central Zone Projected Average Day Demand (MGD)	East Zone Projected Average Day Demand (MGD)	Total Projected Average Day Demand (MGD)	West Zone Projected Maximum Day Demand (MGD)	High/Central Zone Projected Maximum Day Demand (MGD)	East Zone Projected Maximum Day Demand (MGD)	Total Projected Maximum Day Demand (MGD)	Total Projected Max:Avg Ratio	Projected Average GPCD
2019	13,273	0.00	0.67	0.072	0.74	0.00	1.50	0.16	1.66	2.23	55.9
2020	13,479	0.01	0.71	0.072	0.79	0.01	1.56	0.16	1.74	2.18	59.0
2025	16,992	0.07	0.92	0.072	1.06	0.08	1.87	0.16	2.12	2.01	62.2
2030	20,091	0.12	1.13	0.072	1.32	0.15	2.19	0.16	2.50	1.90	65.6
2035	23,190	0.18	1.33	0.072	1.58	0.22	2.51	0.16	2.89	1.83	68.2
2040	26,289	0.23	1.54	0.072	1.84	0.28	2.82	0.16	3.27	1.78	70.1
2045	29,388	0.29	1.75	0.072	2.10	0.35	3.14	0.16	3.66	1.74	71.6
2050	32,487	0.34	1.95	0.072	2.37	0.42	3.46	0.16	4.04	1.71	72.8
2055	35,585	0.39	2.16	0.072	2.63	0.49	3.77	0.16	4.42	1.68	73.9
2060	38,684	0.45	2.37	0.072	2.89	0.55	4.09	0.16	4.81	1.66	74.7
2065	41,783	0.50	2.58	0.072	3.15	0.62	4.41	0.16	5.19	1.65	75.4
2070	44,882	0.56	2.78	0.072	3.41	0.69	4.72	0.16	5.58	1.63	76.1
2075	47,981	0.61	2.99	0.072	3.68	0.76	5.04	0.16	5.96	1.62	76.6
2080	51,080	0.67	3.20	0.072	3.94	0.82	5.36	0.16	6.34	1.61	77.1

Water Demand and Population Equivalent (PE) Projections

W/O Far West growth

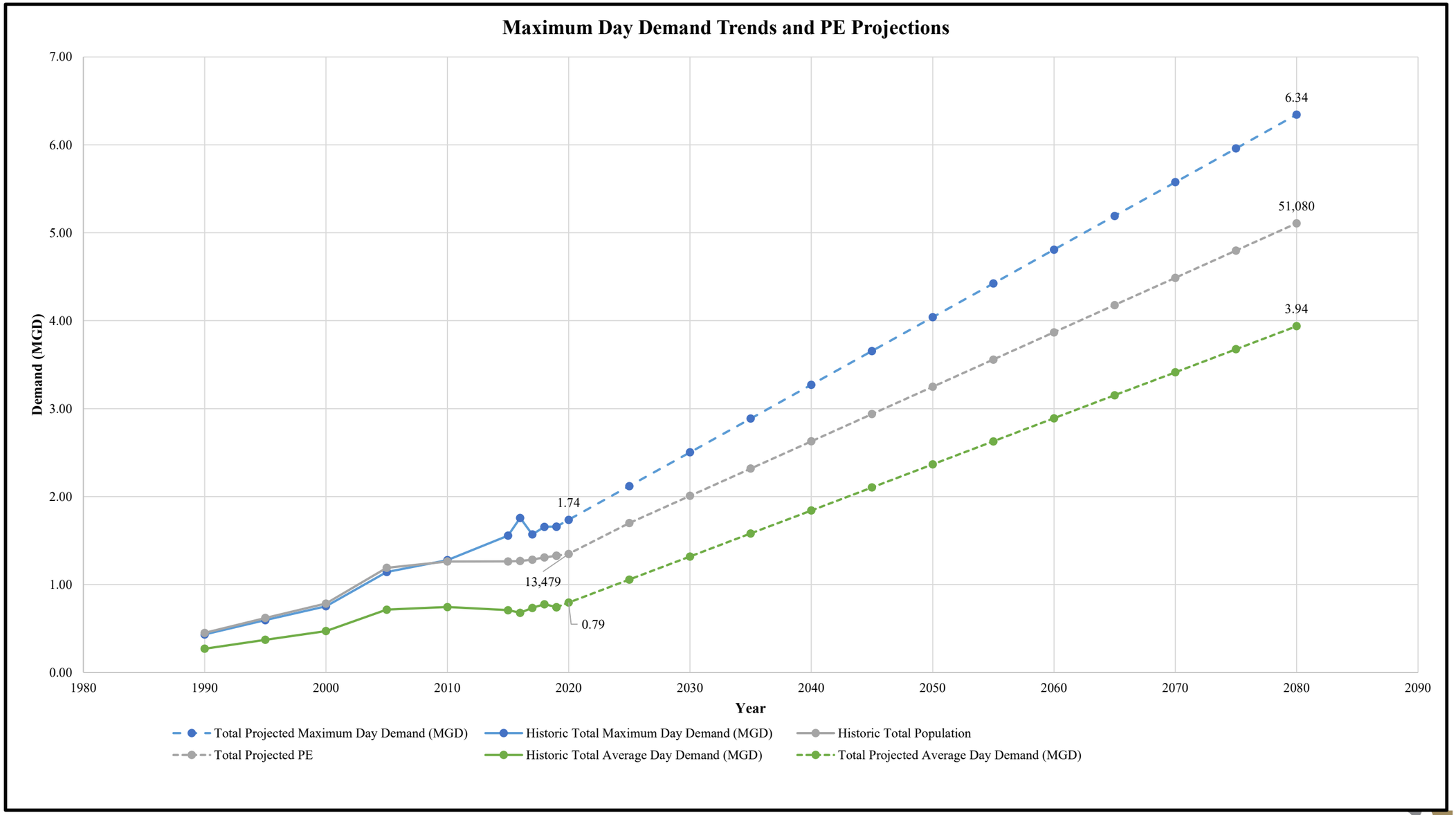
Projected PE & Water Use Data

Year	Total Projected PE	West Zone Projected Average Day Demand (MGD)	High/Central Zone Projected Average Day Demand (MGD)	East Zone Projected Average Day Demand (MGD)	Total Projected Average Day Demand (MGD)	West Zone Projected Maximum Day Demand (MGD)	High/Central Zone Projected Maximum Day Demand (MGD)	East Zone Projected Maximum Day Demand (MGD)	Total Projected Maximum Day Demand (MGD)	Total Projected Max:Avg Ratio	Projected Average GPCD
2019	13,273	0.00	0.67	0.072	0.74	0.00	1.50	0.16	1.66	2.23	55.9
2020	13,479	0.00	0.71	0.072	0.78	0.00	1.56	0.16	1.72	2.20	58.1
2025	15,680	0.00	0.92	0.072	0.99	0.00	1.87	0.16	2.04	2.06	63.2
2030	18,779	0.00	1.13	0.072	1.20	0.00	2.19	0.16	2.35	1.97	63.8
2035	21,878	0.00	1.33	0.072	1.41	0.00	2.51	0.16	2.67	1.90	64.2
2040	24,977	0.00	1.54	0.072	1.61	0.00	2.82	0.16	2.99	1.85	64.5
2045	28,076	0.00	1.75	0.072	1.82	0.00	3.14	0.16	3.30	1.82	64.8
2050	31,175	0.00	1.95	0.072	2.03	0.00	3.46	0.16	3.62	1.79	65.0
2055	35,583	0.39	2.16	0.072	2.62	0.49	3.77	0.16	4.43	1.69	73.7
2060	38,684	0.45	2.37	0.072	2.89	0.55	4.09	0.16	4.80	1.66	74.7
2065	41,783	0.50	2.58	0.072	3.15	0.62	4.41	0.16	5.19	1.65	75.3
2070	44,882	0.56	2.78	0.072	3.42	0.69	4.72	0.16	5.58	1.63	76.1
2075	47,981	0.61	2.99	0.072	3.67	0.76	5.04	0.16	5.96	1.62	76.5
2080	51,080	0.67	3.20	0.072	3.94	0.82	5.36	0.16	6.34	1.61	77.1

Either Supply Far West with New Deep Well or Pipe Well 7 Supply to Far West Until Beyond 2050

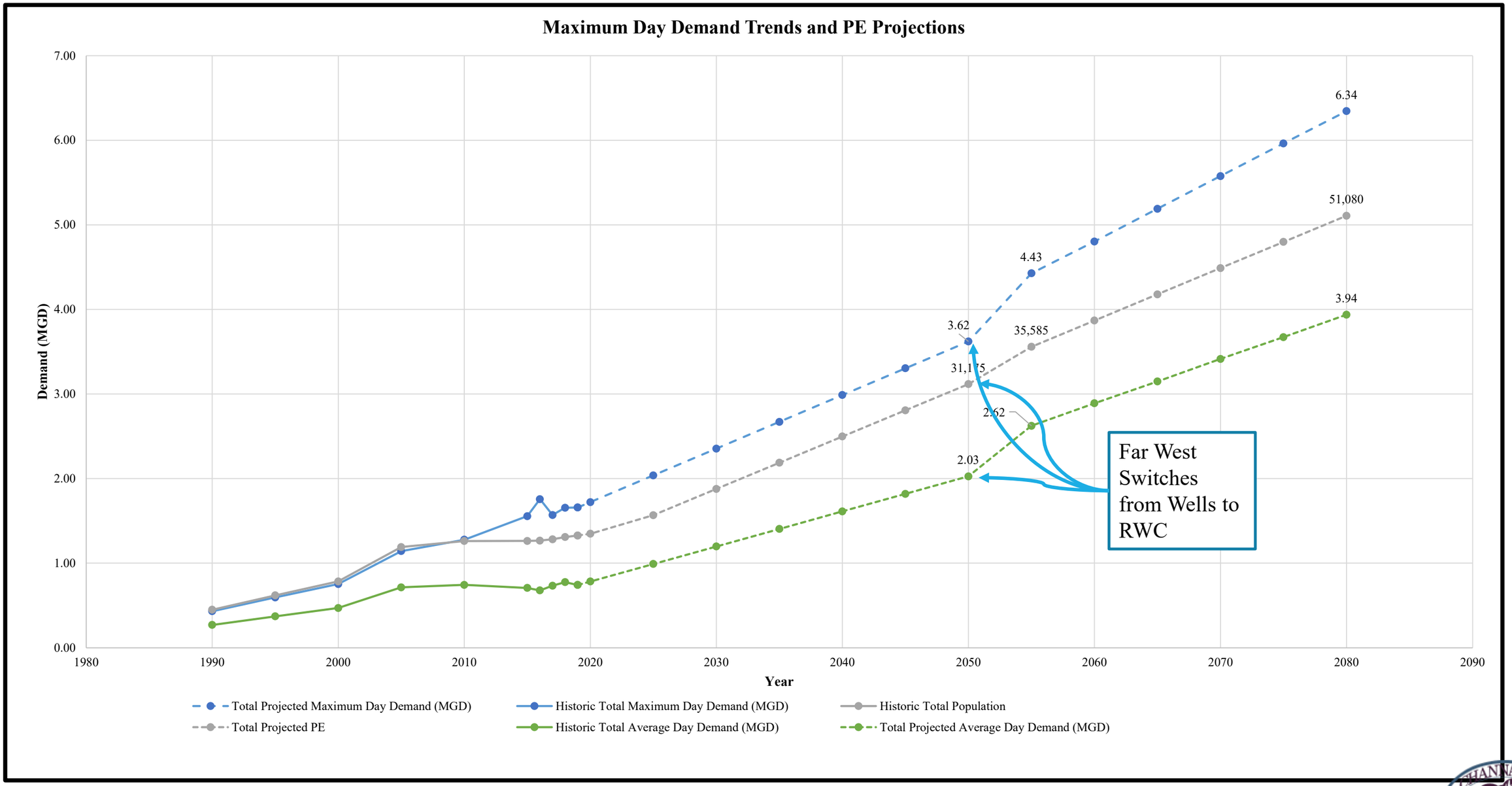
Graph of Historic and Projected Water Demand and PE Trend

W/ Far West Growth Included



Graph of Historic and Projected Water Demand and PE Trend

W/O Far West Growth



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Alternative Analysis

Concept Level Evaluation of Two Water Supply Alternatives:

- Lake Michigan via Regional Water Commission
- Illinois River via Minooka Shared AWTP

Developed Year 2020 EOPC for both options from the Lake/River to the Resident's Faucet

Used 2050 projected water demands to determine infrastructure needs.

W/ Far West	W/O Far West
- 2.37 MGD Average	- 2.03 MGD Average
- 4.04 MGD Maximum	- 3.62 MGD Maximum

Alternative Analysis

Concept Level Evaluation of Three Water Supply Alternatives

Inputs & Assumptions

Lake Michigan via Regional Water Commission

Illinois River AWTP - Channahon only

Illinois River AWTP shared with Minooka by 2030

Illinois River AWTP shared with Minooka by 2042

Variable Inputs and Assumptions

Alternative Number	1	2	3	4
Alternative Title	Regional Water Commission - Low OPCC	Regional Water Commission - High OPCC	Illinois River With Minooka Shared WTP	Remain on Wells Untill 2042, Then Switch to Illinois River With Minooka Shared WTP
Current Cost Year	2020	2020	2020	2020
Future Cost Year	2030	2030	2030	2030
Full Buildout Year	2050	2050	2050	2050
Anticipated New PE per Year	620	620	620	620
Anticipated New Connections per Year	194	194	194	194
Impact Fee per PE	$3,500	$3,500	$3,500	$3,500
Interest Rate	2.5%	2.5%	2.5%	2.5%
Capital Cost Escalation Rate	3.0%	3.0%	3.0%	3.0%
O&M Escallation Rate	2.0%	2.0%	2.0%	2.0%
Purchase Rate Escalation	1.35%	2.0%	3.0%	3.0%
Payback Period (years)	30	30	30	30
First Debt Service Payment Year	2027	2027	2027	2040
Technical Services (Legal & Engineering)	20%	20%	20%	20%
Contingency	25%	25%	30%	30%
Contractor's General Conditions	8%	8%	8%	8%
Environmental/Other Factors	0%	0%	10%	10%
Water Supply Delivery Charge (per kgal)	2.74	3.38		
Water Supply O&M Charge (per kgal)	0.39	0.39		
Delivery Charge Year	2030	2030		
Commission Capital Cost per 2050 MGD	$12,900,000	$16,000,000		
Commission Capital Cost Year	2020	2020		
Initial OM&R Reserve Fund Contribution ($/MGD)	$39,000	$39,000	$0	$0
Commission Administration Fee ($/year)	$160,000	$160,000	$0	$0
2020 Average Day Demand (MGD)	0.79	0.79	0.79	0.79
2020 Max Day Demand (MGD)	1.74	1.74	1.74	1.74
2030 Average Day Demand (MGD)	1.32	1.32	1.32	1.32
2030 Max Day Demand (MGD)	2.50	2.50	2.50	2.50
2050 Average Day Demand (MGD)	2.37	2.37	2.37	2.37
2050 Max Day Demand (MGD)	4.04	4.04	4.04	4.04
Local Production Cost ($/kGal)				$2.83
Local Distribution Cost ($/kGal)	$4.09	$4.09	$4.09	$4.09
Local Capital Cost ($/kGal)				

Connection Charge Consideration

Applies to Debt & Assumes low Interest or WIFIA Funding

Assumes Annual Average Capital Cost Escalation (CPI) of 3.0%

Cost of Chemicals, Labor, Materials, Utilities Increase at 2% per Year

Increase Rate of Wholesale Purchase Price

Variable Inputs and Assumptions

Alternative Number	1	2	3	4
Alternative Title	Regional Water Commission - Low OPCC	Regional Water Commission - High OPCC	Illinois River With Minooka Shared WTP	Remain on Wells Untill 2042, Then Switch to Illinois River With Minooka Shared WTP
Current Cost Year	2020	2020	2020	2020
Future Cost Year	2030	2030	2030	2030
Full Buildout Year	2050	2050	2050	2050
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2050 Max Day Demand (MGD)	4.04	4.04	4.04	4.04
Local Production Cost ($/kGal)				$2.83
Local Distribution Cost ($/kGal)	$4.09	$4.09	$4.09	$4.09
Local Capital Cost ($/kGal)				

Assumes 30 Year Loan

For “Online by 2030”, 2027 Mid Construction Year. For “Online by 2042”, 2040 Mid Construction Year

Contingencies Lower for Concepts with Higher Level of Development

Illinois River Project Would Likely Have Major Environmental Hurdles & Pushback

Variable Inputs and Assumptions

Alternative Number	1	2	3	4
Alternative Title	Regional Water Commission - Low OPCC	Regional Water Commission - High OPCC	Illinois River With Minooka Shared WTP	Remain on Wells Untill 2042, Then Switch to Illinois River With Minooka Shared WTP
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Full Buildout Year	2050	2050	2050	2050
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2020 Average Day Demand (MGD)	0.79	0.79	0.79	0.79
2020 Max Day Demand (MGD)	1.74	1.74	1.74	1.74
2030 Average Day Demand (MGD)	1.32	1.32	1.32	1.32
2030 Max Day Demand (MGD)	2.50	2.50	2.50	2.50
2050 Average Day Demand (MGD)	2.37	2.37	2.37	2.37
2050 Max Day Demand (MGD)	4.04	4.04	4.04	4.04
Local Production Cost ($/kGal)				$2.83
Local Distribution Cost ($/kGal)	$4.09	$4.09	$4.09	$4.09
Local Capital Cost ($/kGal)				

Commission Purchases from Chicago

Commission O&M Charge

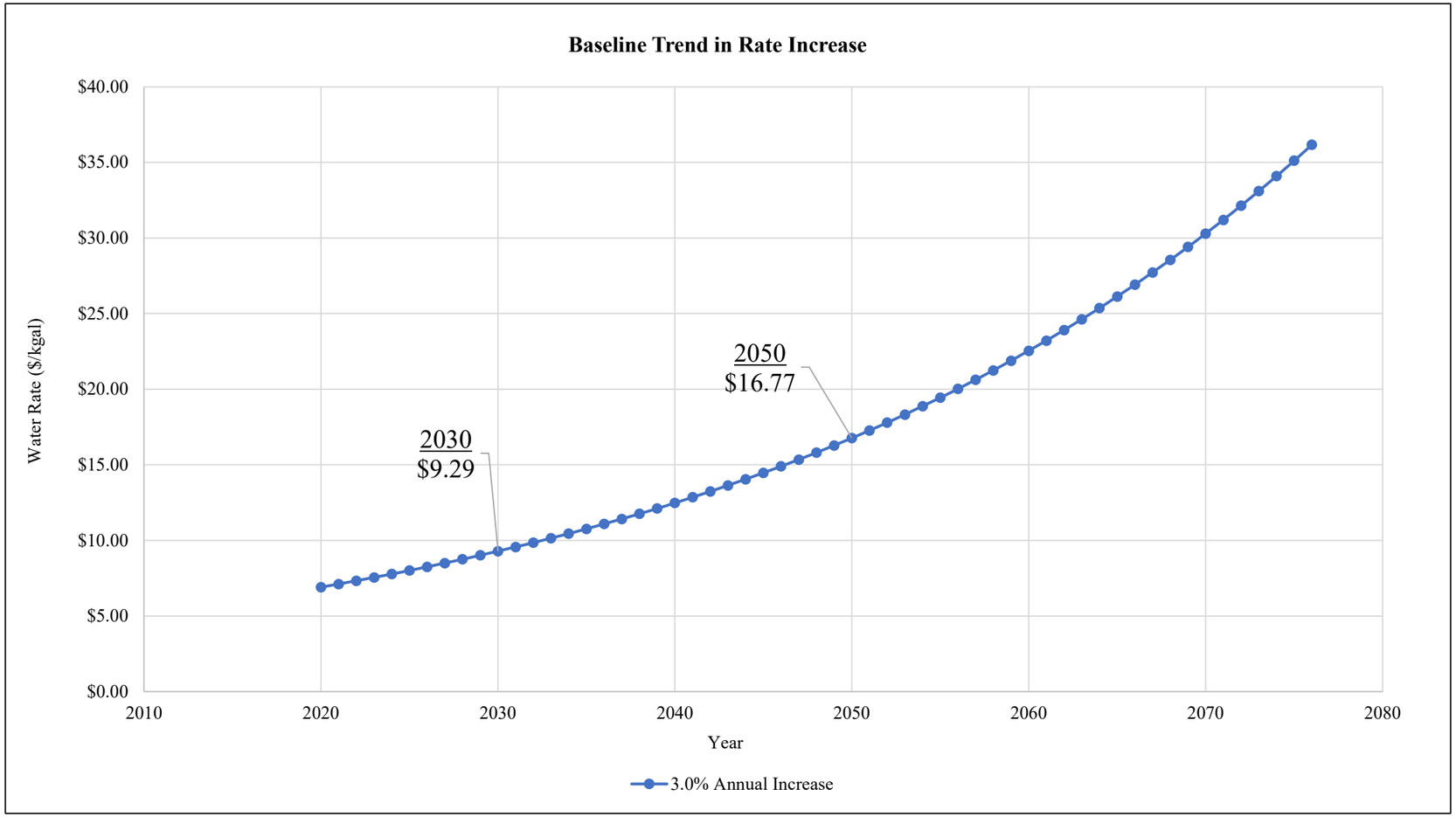
Buy-in Commission Infrastructure Cost

Portion of Rate Applied to Production

Portion of Rate Applied to Distribution

Commission Replacement & Administrative Charge

Current Rate Escalation



2020 Low EOPC of Lake Michigan Via Regional Water Commission

W/ Far West Growth Included

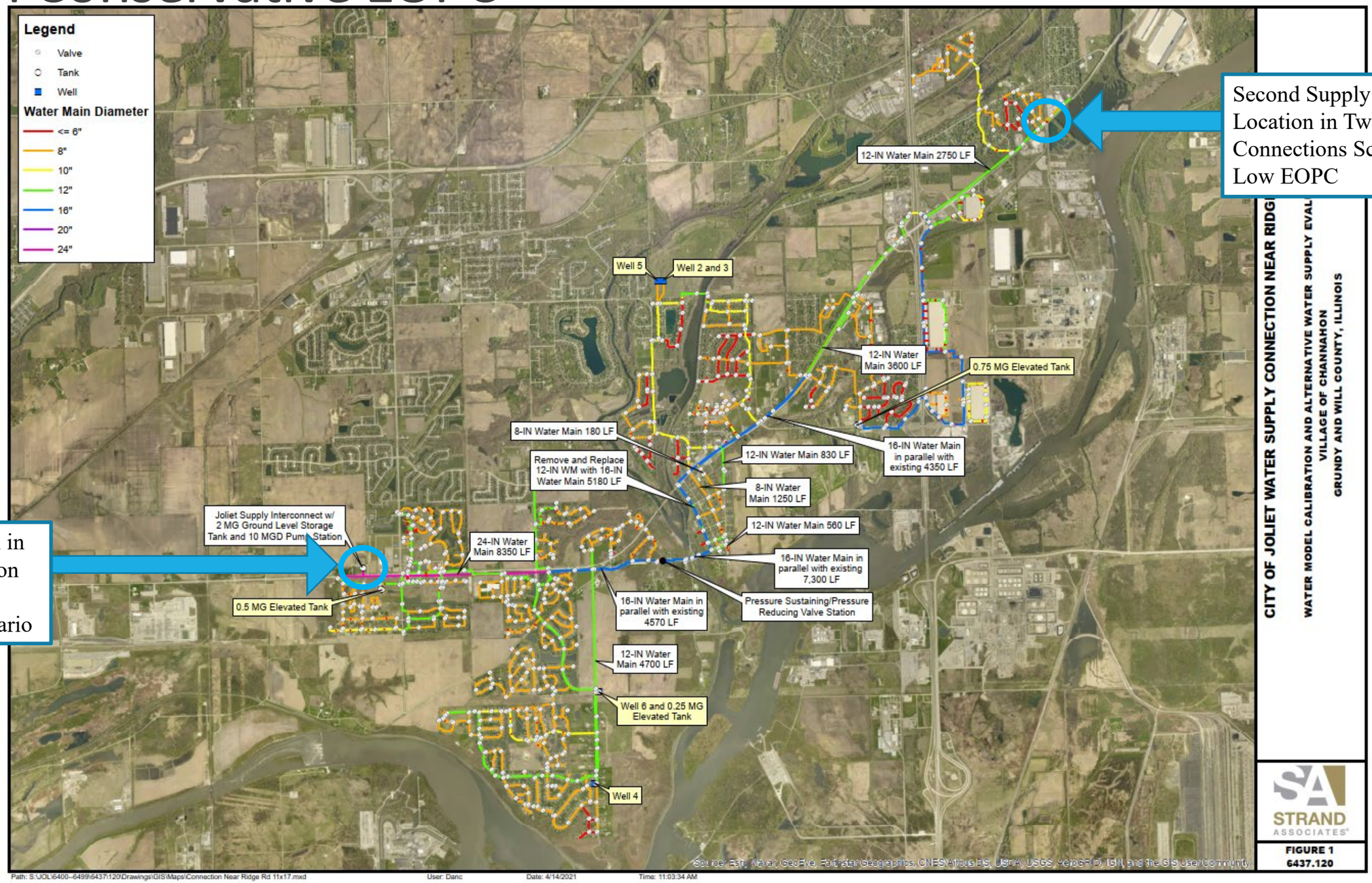
Mid-Construction Year for Start of Capital Payment

Component	2020 Capital Cost	2020 Annual Cost	2020 Rate Impact ($/kgal)	2027 Capital Cost	2027 Annual Cost	2030 Rate Impact ($/kgal)	2050 Rate Impact ($/kgal)
Capital Improvements							
Preliminary Engineering & Legal	$750,000	$35,900	$0.12	$922,400	$44,100	$0.09	$0.05
Water Commission Infrastructure Connection Charge	$52,114,000	$2,489,900	$8.59	$64,093,600	$3,062,300	$6.36	$3.55
Storage and Pumping Stations	$9,792,000	$467,900	$1.61	$12,042,900	$575,400	$1.20	$0.67
Local Distribution and Transmission Main Improvements	$12,496,100	$597,100	$2.06	$15,368,600	$734,300	$1.53	$0.85
Debt Service Payment		***$3,590,800***			***$4,416,100***		
Bulk Water Purchase							
Water Supply Delivery Charge			$2.40			$2.74	$3.58
Water Supply O&M Charge			$0.32			$0.39	$0.58
Distribution System Operations							
Production		$0	$0.00		$0	$0.00	$0.00
Distribution		$1,186,900	$4.09		$2,400,900	$4.99	$7.41
Capital		$0	$0.00		$0	$0.00	$0.00
Other							
Commission Reserve Fund Fee (2025-2030)	$905,300	$173,800	$0.62		$213,800	$0.00	$0.00
Commission Administrative Fees (2022-2029)		^ Includes Reserve Fund and Administrative Fees	$0.38		^ Includes Reserve Fund and Administrative Fees	$0.00	$0.00
Commission Administrative Fees (2030-)			$0.00			$0.41	$0.34
Customer Fees							
Credit from Connection Fees[1]	-$7,231,600	-$369,000		-$13,558,000	-$691,800	-$1.03	-$1.04
Total	**$75,152,100**	**$4,951,500**	**$20.19**	**$92,427,500**	**$7,030,800**	**$16.67**	**$15.99**

Assumptions

- $12,900,000 /2050 MGD Buy-in
- 1.35% Purchase rate Escalation
- Two Supply Connections Minimize Villages Internal Improvements

Lake Michigan Via Regional Water Commission Internal Improvements for High Conservative EOPC



Second Supply Location in Two Connections Scenario / Low EOPC

Supply Location in Single Connection Scenario & Two Connected Scenario

2020 Low EOPC of Lake Michigan Via Regional Water Commission
W/ Far West Growth Included

Component	2020 Capital Cost	2020 Annual Cost	2020 Rate Impact ($/kgal)	2027 Capital Cost	2027 Annual Cost	2030 Rate Impact ($/kgal)	2050 Rate Impact ($/kgal)
Capital Improvements							
Preliminary Engineering & Legal	$750,000	$35,900	$0.12	$922,400	$44,100	$0.09	$0.05
Water Commission Infrastructure Connection Charge	$52,114,000	$2,489,900	$8.59	$64,093,600	$3,062,300	$6.36	$3.55
Storage and Pumping Stations	$9,792,000	$467,900	$1.61	$12,042,900	$575,400	$1.20	$0.67
Local Distribution and Transmission Main Improvements	$12,496,100	$597,100	$2.06	$15,368,600	$734,300	$1.53	$0.85
Debt Service Payment		***$3,590,800***			***$4,416,100***		
Bulk Water Purchase							
Water Supply Delivery Charge			$2.40			$2.74	$3.58
Water Supply O&M Charge			$0.32			$0.39	$0.58
Distribution System Operations							
Production		$0	$0.00		$0	$0.00	$0.00
Distribution		$1,186,900	$4.09		$2,400,900	$4.99	$7.41
Capital		$0	$0.00		$0	$0.00	$0.00
Other							
Commission Reserve Fund Fee (2025-2030)	$905,300	$173,800	$0.62		$213,800	$0.00	$0.00
Commission Administrative Fees (2022-2029)		^Includes Reserve Fund and Administrative Fees	$0.38		^Includes Reserve Fund and Administrative Fees	$0.00	$0.00
Commission Administrative Fees (2030-)			$0.00			$0.41	$0.34
Customer Fees							
Credit from Connection Fees[1]	-$7,231,600	-$369,000		-$13,558,000	-$691,800	-$1.03	-$1.04
Total	**$75,152,100**	**$4,951,500**	**$20.19**	**$92,427,500**	**$7,030,800**	**$16.67**	**$15.99**

Assumptions

- $12,900,000 /2050 MGD Buy-in
- 1.35% Wholesale Purchase rate Escalation
- Two Supply Connections Minimize Villages Internal Improvements

2020 High EOPC of Lake Michigan Via Regional Water Commission

W/ Far West Growth Included

Component	2020 Capital Cost	2020 Annual Cost	2020 Rate Impact ($/kgal)	2027 Capital Cost	2027 Annual Cost	2030 Rate Impact ($/kgal)	2050 Rate Impact ($/kgal)
Capital Improvements							
Preliminary Engineering & Legal	$750,000	$35,900	$0.12	$922,400	$44,100	$0.09	$0.05
Water Commission Infrastructure Connection Charge	$64,637,500	$3,088,300	$10.65	$79,496,000	$3,798,200	$7.89	$4.40
Storage and Pumping Stations	$9,280,000	$443,400	$1.53	$11,413,200	$545,300	$1.13	$0.63
Local Distribution and Transmission Main Improvements	$22,197,900	$1,060,600	$3.66	$27,300,600	$1,304,400	$2.71	$1.51
Debt Service Payment		***$4,628,200***			***$5,692,000***		
Bulk Water Purchase							
Water Supply Delivery Charge			$2.77			$3.38	$5.02
Water Supply O&M Charge			$0.32			$0.39	$0.58
Distribution System Operations							
Production		$0	$0.00		$0	$0.00	$0.00
Distribution		$1,186,900	$4.09		$2,400,900	$4.99	$7.41
Capital		$0	$0.00		$0	$0.00	$0.00
Other							
Commission Reserve Fund Fee (2025-2030)	$905,300	$173,800	$0.62		$213,800	$0.00	$0.00
Commission Administrative Fees (2022-2029)	^Includes Reserve Fund and Administrative Fees		$0.38	^Includes Reserve Fund and Administrative Fees		$0.00	$0.00
Commission Administrative Fees (2030-)			$0.00			$0.41	$0.34
Customer Fees							
Credit from Connection Fees[1]	-$7,231,600	-$369,000		-$13,558,000	-$691,800	-$1.03	-$1.04
Total	**$96,865,400**	**$5,988,900**	**$24.15**	**$119,132,200**	**$8,306,700**	**$19.96**	**$18.90**

[1]**Not included in capital costs or Annual Costs**

Assumptions

- $16,000,000 /2050 MGD Buy-in
- +/- $10,000,000 in Additional Internal Improvements
- 2.0% Wholesale Purchase rate Escalation

Regional Water Commission without Far West until after 2050

- When the growth in the west uses wells until after 2050:

- Fewer PE (households and connections) in the Lake Michigan Water supplied system
- Buy in costs are $4M less, but the internal infrastructure costs are the same

2030 Conceptual rate $17.03 – 20.41/kgal

2050 Conceptual rate $16.54 – 19.60/kgal

Illinois River Results – Channahon Only

- Channahon builds intake, Advanced Water Treatment Plant, and Transmission Main

- Intake into Marseilles Pool and Plant at new property near Tabler Road
- 30-inch high pressure transmission main to Ridge Road and Route 6
- Internal improvements similar to Single Delivery Point Regional Water Commission

2030 Conceptual rate $22.12/kgal

2050 Conceptual rate $17.65/kgal

Illinois River Results – Partnering with Minooka

- Illinois River with Minooka Shared AWTP

- Channahon pays their portion of shared capital costs based on demands
- 10% Environmental contingency to account for uncertainty in emerging contaminates and endangered species in the area

2030 Conceptual rate $18.07/kgal

2050 Conceptual rate $15.09/kgal

- Remain on Wells Till 2040, Then Switch to Illinois River With Minooka Shared AWTP

- Channahon pays their portion of shared capital costs based on demands
- Minooka decides to stay on wells till 2040 then switch to Illinois River as well
- 10% Environmental contingency to account for uncertainty in emerging contaminates and endangered species in the area

2050 Conceptual rate $17.95/kgal

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Conceptual Rate Comparison

Alternative	Capital Costs (2020 Dollars)	2020 Annual OM&R (30 yrs)	Conceptual 2030 Rate ($/kgal)	2030 Average Bill per Billing Cycle	Conceptual 2050 Rate ($/kgal)	2050 Average Bill per Billing Cycle
No Change - With 3% Increase per Year	-	-	$9.29	$46.43	$16.77	$83.86
Regional Water Commission - Low OPCC	$75,152,100	$4,951,500	$16.67	$83.35	$15.99	$79.93
Regional Water Commission - High OPCC	$96,865,400	$5,988,900	$19.96	$99.80	$18.90	$94.52
Illinois River With Minooka Shared WTP	$89,691,900	$6,718,500	$18.07	$90.33	$15.09	$75.46
Remain on Wells Until 2042, Then Switch to Illinois River With Minooka Shared WTP	-	-	$9.29	$46.43	$17.95	$89.75

2030 Alternative Rate Summary Table	With the Far West	Without the Far West
Regional Water Commission	$16.67 - $19.96	$16.80 - $20.19
Channahon Only IL River AWTP	$22.12	N/A
Shared IL River With Minooka	$18.07	$18.26
Remain on Wells Untill 2042, Then Switch to Illinois River With Minooka Shared AWTP	$9.29	$9.29

2030 Conceptual Rate Comparison

2030 Alternatives Impact on Residents Total Utility Bill

2030 Resident Average Monthly Water Bill

Alternative	Water	Sewer	Administration Fee - Water	Administration fee - Sewer	Refuse - Garbage/Recycle/Yard	Refuse - Garbage/Recycle/Yard	Total
No Change - With 3% Increase per yr	$46.43	$56.34	$2.50	$2.50	$27.25	$1.34	**$136.37**
Regional Water Commission - Low OPCC	$83.35	$56.34	$2.50	$2.50	$27.25	$1.34	**$173.28**
Regional Water Commission -High OPCC	$99.80	$56.34	$2.50	$2.50	$27.25	$1.34	**$189.74**
Illinois River With Minooka Shared WTP	$90.33	$56.34	$2.50	$2.50	$27.25	$1.34	**$180.26**
Remain on Wells Untill 2042, Then Switch to Illinois River With Minooka Shared WTP	$46.43	$56.34	$2.50	$2.50	$27.25	$1.34	**$136.37**

2050 Alternative Rate Summary Table	With the Far West	Without the Far West
Regional Water Commission	$15.99 - $18.9	$16.30 - $19.36
Channahon Only IL River AWTP	$17.65	N/A
Shared IL River With Minooka	$15.09	$15.61
Remain on Wells Untill 2042, Then Switch to Illinois River With Minooka Shared AWTP	$17.95	$19.06

2050 Conceptual Rate Comparison

2050 Alternatives Impact on Residents Water Bill

2050 Resident Average Monthly Water Bill

Alternative	Water	Sewer	Administration Fee - Water	Administration fee - Sewer	Refuse - Garbage/Recycle/Yard	Refuse - Garbage/Recycle/Yard	Total
No Change - With 3% Increase per yr	$83.86	$101.75	$2.50	$2.50	$49.22	$2.43	**$242.26**
Regional Water Commission - Low OPCC	$79.93	$101.75	$2.50	$2.50	$49.22	$2.43	**$238.34**
Regional Water Commission -High OPCC	$94.52	$101.75	$2.50	$2.50	$49.22	$2.43	**$252.92**
Illinois River With Minooka Shared WTP	$75.46	$101.75	$2.50	$2.50	$49.22	$2.43	**$233.86**
Remain on Wells Untill 2042, Then Switch to Illinois River With Minooka Shared WTP	$88.26	$101.75	$2.50	$2.50	$49.22	$2.43	**$246.66**

Pros/Cons

Lake Michigan water

Pros:

- Lake Michigan Water Quality
- Lowest risk of running out of water
- Water treatment by other entities
  - City of Chicago High Quality Operation
  - Village will not have to deal will emerging contaminates

Cons:

- Switching Earlier Than Needed

River water

Pros:

- Low risk of running out of water
- Switch to river can occur closer to aquifer depletion

Cons:

- Poor water quality, requires high levels of treatment
- Low flow periods – Emergency Backup Wells/Supply
- Regulatory approval will be challenging
- Village is responsible for treating water and possible new contaminates
- Potentially lose opportunity to obtain Lake Michigan allocation

Village of Channahon

Preliminary Alternative Water Source Study

Presentation Overview – October 26, 2021 Presentation

- Current Water Demands and Future Water Demand Projections - Review
- Alternative Analysis
- Comparison of Conceptual Cost
- Timeline and Next Steps

Timeline

Previous Water Studies Predicted Long Term Availability

2019
Joined SW Planning Group – ISWS Model & Study Commissioned

2020
Initial Draft Report Received From Illinois State Water Survey

2020
Joliet Decides to Pursue Lake Michigan Water

2021
Joliet Decides Lake Michigan Water Via Regional Water Commission

2022
1st Quarter 2022 Decision For Regional Water Commission Partnership

2020-2021
- 1st Half 2021 Received Report From Il. State Water Survey
- Started Research On Alt. Water Sources
- Channahon Contracted Strand Associates To Begin Detailed Study

March 31st, 2022
Application With IDNR For Water Allocation Due

Once Allocation Permits Received
IGA To Create Commission And Ordinance To Approve

After Water Commission is Established
- Commission By-Laws Ordinance
- Water Agreement B/W Chicago and Joliet
- Water Agreement B/W Commission and Members
- Program Management Agreement B/W Commission and Joliet