Lori Folbrick

From: Jim Keim
Sent: Thursday, April 16, 2015 3:22 PM
To: Lori Folbrick
Subject: FW: PowerPoint Presentation (VOA Feasibility-Cost Study of Lake Mich Water Supply Alternatives)
Attachments: pres-042015-CouncilPresentation.pdf

From: Weyde, Diane [mailto:dweyde@hrgreen.com]
Sent: Wednesday, April 15, 2015 9:56 AM
To: Jim Keim
Cc: Hartnett, Timothy; Pugh, Charles; Rittenbacher, Brittany; Hardie, Mark
Subject: PowerPoint Presentation (VOA Feasibility-Cost Study of Lake Mich Water Supply Alternatives)

SENT ON BEHALF OF TIM HARTNETT

Good Morning Jim:

Attached please find the updated PowerPoint presentation to be discussed at the upcoming April 20th Board meeting. The following slides were revised/updated or added based on the last Board Meeting presentation.

Slide 1 Date changed
Slide 2 Year was changed to 2015 vs 2014
Slide 11 The water usage rate increased from 1% to 3%. A note was added to the bottom regarding the Village's infrastructure needs to bring Lake Michigan water into the Village.
Slides 12, 13, 14 The numbers changed due to the water usage rate change from 1% to 3%
Slide 15 Changed due to the Village water rate being $3.58 /1000 gallons
Slides 16, 17, 18 All changed due to water fee cost change
Slide 19 Is a new slide—Added the cost per 1000 at key points on the chart
Slide 20 Changed because of the water delivery charge increase
Slides 21, 22, and 23 Slides are new—because we added a gradual increase of water usage from 1MGD to 2.3 MGD. They also changed due to the water free from 1% to 3% and adding the 1000/gallon information. A conclusion statement was added to Slide 23.
Slide 24, 25, 26, 27, 28 Slides are new—Adds new information to compare VOA vs. Lake Co. PWD

Note, Mark Hardie has been on jury duty since Monday so Tim Hartnett will give you a call later this morning/early afternoon to go over everything so you can then place this in the Board packet.

Thank you,

DIANE WEYDE
Administrative Manager
HR GREEN, INC.

Village of Antioch Feasibility/Cost Study of Lake Michigan Water Supply Alternatives – Status Update

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April 20, 2015

Introduction

Objective of the feasibility/cost study: Review viable options to bring treated water to Antioch.

	Current Demand (2015)		Future Demand (2035)		Lake Michigan Allocation (2030)	
	Avg (MGD)	Max (MGD)	Avg (MGD)	Max (MGD)	Avg (MGD)	Max (MGD)
Antioch	1.0	1.8	2.3	4.0	2.6*	5.0**

*Assumes 91 gpcpd
**Assumes 1.9 peaking factor

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Four Lake Michigan Water Supply Alternatives Were Evaluated

- Central Lake County Joint Action Water Agency (CLCJAWA)
- City of Waukegan
- Lake County Public Water District (PWD)
- Kenosha Water Utility (KWU)

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Kenosha Alternative – Bringing LM water across state lines

- Section 4.14: U.S. Supreme Court Decree: Wisconsin et al. v. Illinois et al.:
  - Diversion provisions do not apply to Illinois; diverting water from Wisconsin to Illinois may be prohibited.
  - Application to Great Lakes Council
  - Unanimous approval from Great Lakes Council
- Diversion limits placed on Illinois due to water leaving watershed

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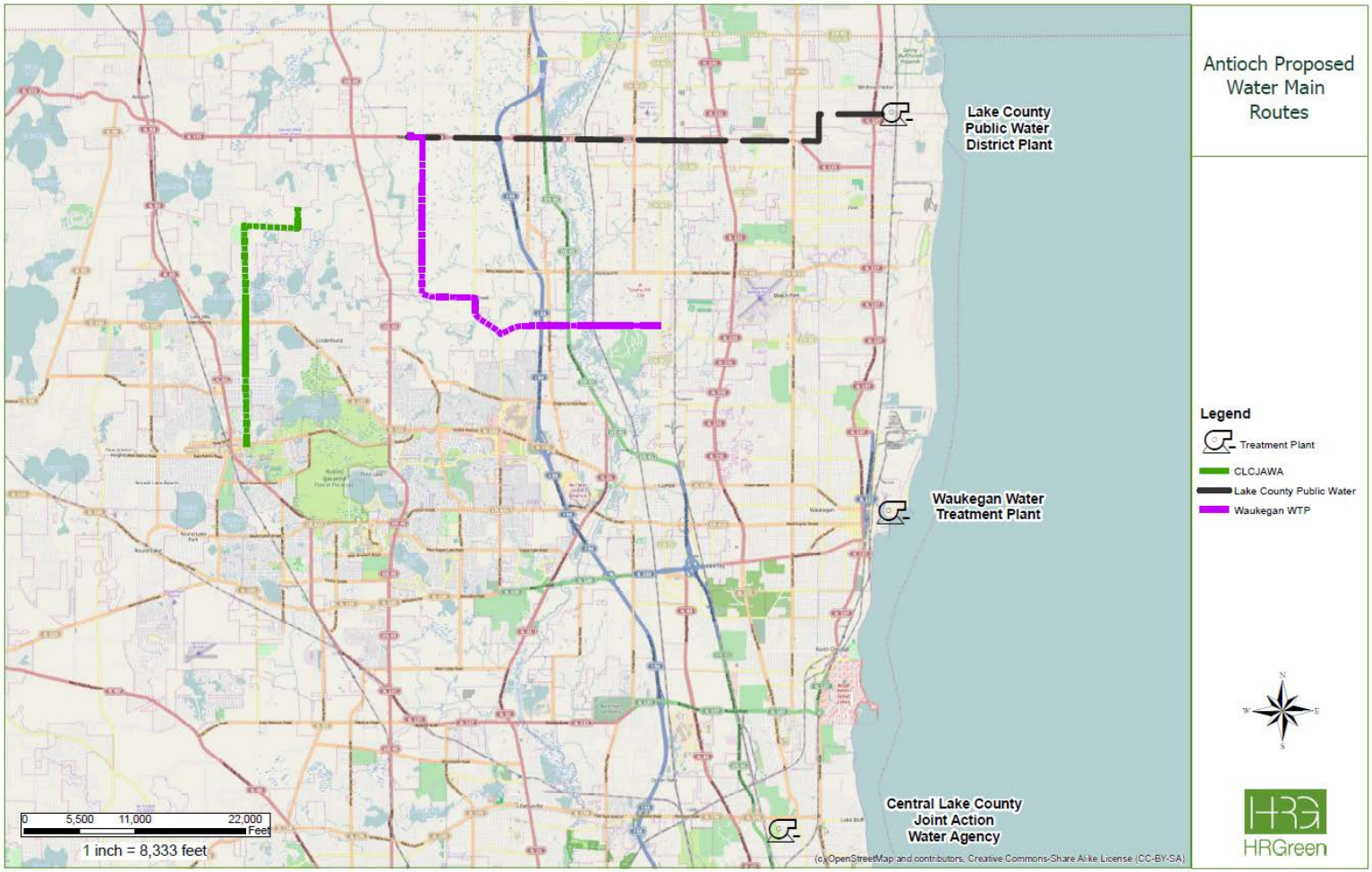
Conceptual Main Routes from Supply Point to Antioch have been Explored



Costs to Purchase Treated Water can be Separated into 3 Categories

	Estimated Capital Expense for 5 MGD Capacity	Delivered Water Charge per 1000 gallons	Repair and Replacement Account at Water Treatment Plant
CLCJAWA	$12.7 M	$3.84	$0.0 M
Waukegan	$0.0* M	$3.60	$0.0 M
Lake County PWD	$13.0 M	$1.68	$0.7 M

*Assumed to be $0 based on preliminary discussions

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Summary of Transmission Main Costs

	Distance (ft)	Engineers Opinion of Probable Project Cost
CLCJAWA	29,400	$13 M
Waukegan	50,300	$21 M
Lake County PWD	54,900	$25 M

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Crossings for each route:

	Waukegan	Lake County PWD
Length (feet)	50,300	54,900
Railroad	1	3
Wetland/Soils/F.P.	6	3
IDOT Highway	3 • US 41 • I-94 • IL 173	4 • US 41 • I-94 • IL 131 • IL 137
Tollway	1 • I-94	1 • I-94
County Highway	3	5
Waterway	6	6
Local Roads	9	8
Easements/ROW	TBD	TBD

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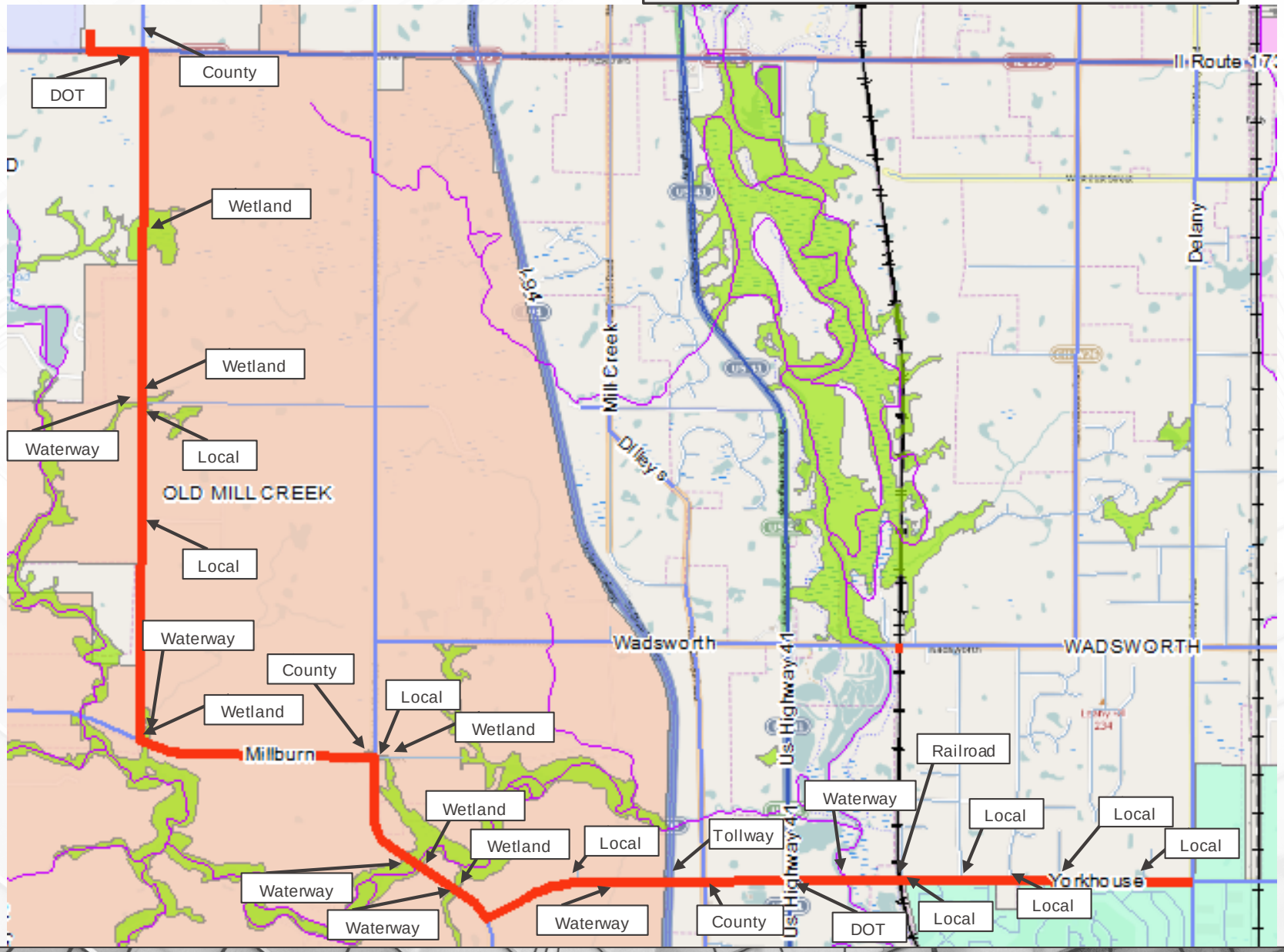
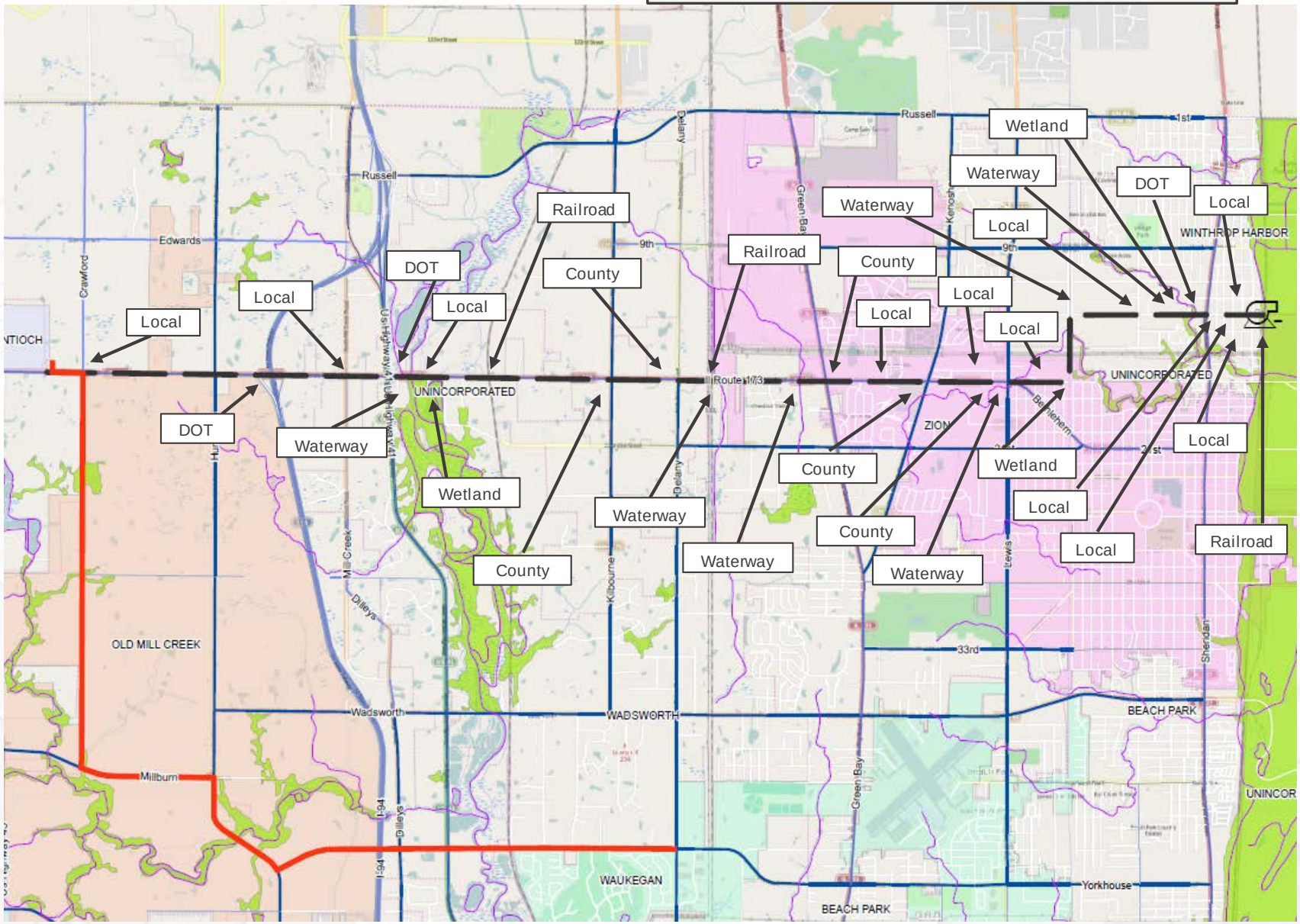
Waukegan Route



Lake County PWD Route



Financial Analysis Assumptions

- **3% interest rate** on all capital costs (plant improvements/expansions and transmission mains)
- **3% rate increase** on water per year
- All Lake Michigan water improvements will have an additional cost to update the Village of Antioch's existing system (not included in analysis)
  - Booster pump station upgrades
  - New booster pump station in Village limits
  - Decommission deep well and infrastructure modifications

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Summary of Treated Water Costs @ 1.0 MGD (Current Average Day Demands)

		Treatment Plant Capital Cost*	20-year Cost of Delivered Water	Repair and Replacement Fund*	Transmission Main Capital Cost*	Total Project Cost
1.	CLCJAWA	$17.1 M	$38.8 M	$0	$17.5 M	$73.4 M
2.	Waukegan	$0.0** M	$36.4 M	$0	$28.2 M	$64.6 M
3.	Lake County PWD	$17.6 M	$17.0 M	$0.7 M	$33.6 M	$68.9 M

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* Includes debt service based on 20 year repayment @ 3.0% interest rate
**Assumed $0 based on preliminary discussions

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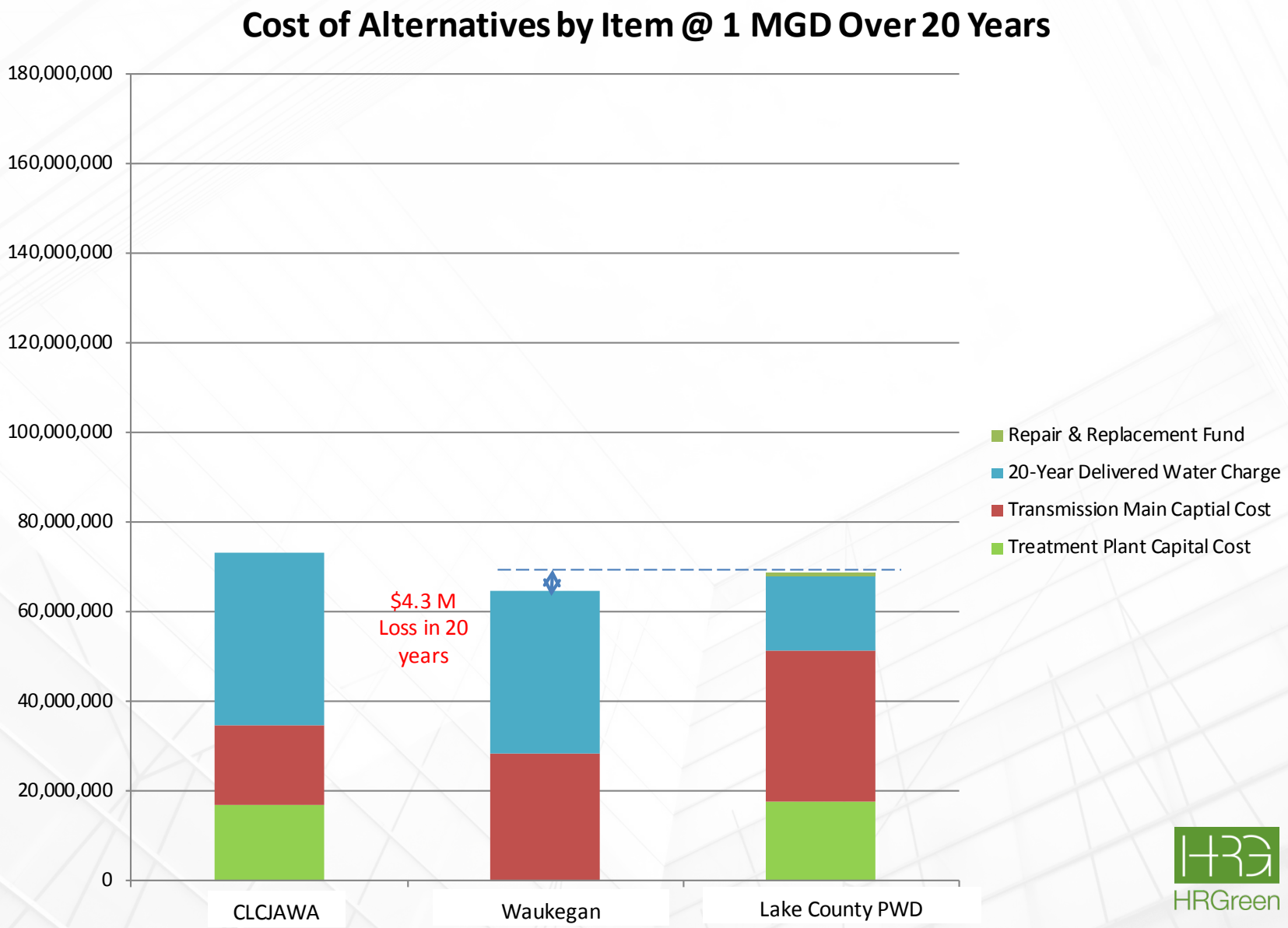
1 MGD Cost Summary



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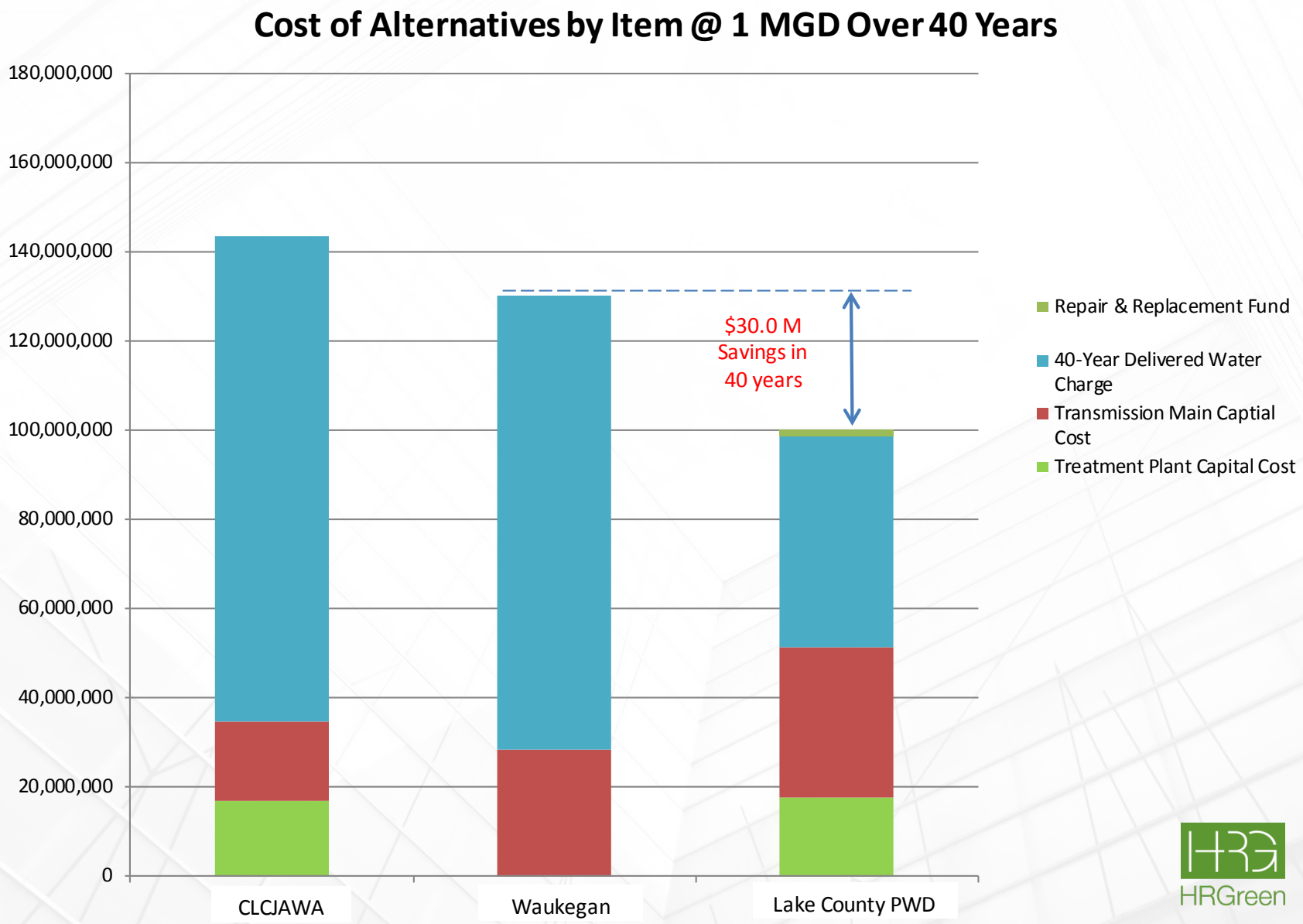
1 MGD Cost Summary



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Financial Analysis Assumptions

- **3% interest rate** on all capital costs (plant improvements/expansions and transmission mains)
- **3% rate increase** on water per year

	CLCJAWA	Waukegan	Lake County
Capital Cost	$12.7 (17.1) M	$0.0 (0.0) M	$13.0 (17.6) M
Transmission Main	$13.0 (17.5) M	$21.0 (28.2) M	$25.0 (33.6) M
$/1,000 gal	$3.84	$3.60	$1.68

*Antioch current rate = $3.58/1,000 gal

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Summary of Treated Water Costs @ 2.3 MGD (Future Average Day Demands)

		Treatment Plant Capital Cost*	20-year Cost of Delivered Water	Repair and Replacement Fund*	Transmission Main Capital Cost*	Total Project Cost
1.	CLCJAWA	$17.1 M	$89.2 M	$0	$17.5 M	$123.8 M
2.	Waukegan	$0.0** M	$83.6 M	$0	$28.2 M	$111.9 M
3.	Lake County PWD	$17.6 M	$39.0 M	$0.7 M	$33.6 M	$91.0 M

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* Includes debt service based on 20 year repayment @ 3.0 % interest rate
**Assumed $0 based on preliminary discussions

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Rate Determination Example Calculation

- Lake County PWD
  - Capital Cost (Cost for Plant Improvements)
    CC = (A/P, i, N)** where A/P = 0.06722, i = 3%, N = 20 years
    CC = ($13,100,000)*0.06722
    CC = **$880,582**

  - Transmission Main
    TM = (A/P, i, N)* where A/P = 0.06722, i = 3%, N = 20 years
    TM = ($25,000,000)*0.06722
    TM = **$1,680,500**

  - Water Fee
    WF = (Flow* $/1,000 gal * 1.03^Years * 365 days) / 1,000 gal
    WF = (1,000,000 gal * $1.68/1,000 gal * 1.03^1 * 365 days) / 1000 gal
    WF = **$631,596/year 1** (current value)

  - Repair & Replacement Fund (RR): $35,000/year

  - TOTAL RATE = CC + TM + WF + RR
  - TOTAL RATE (Year 1, 1 MGD) = $880,582+ $1,680,500+ $631,596 + $35,000 = **$3,227,678**

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**Capital Recovery Formula

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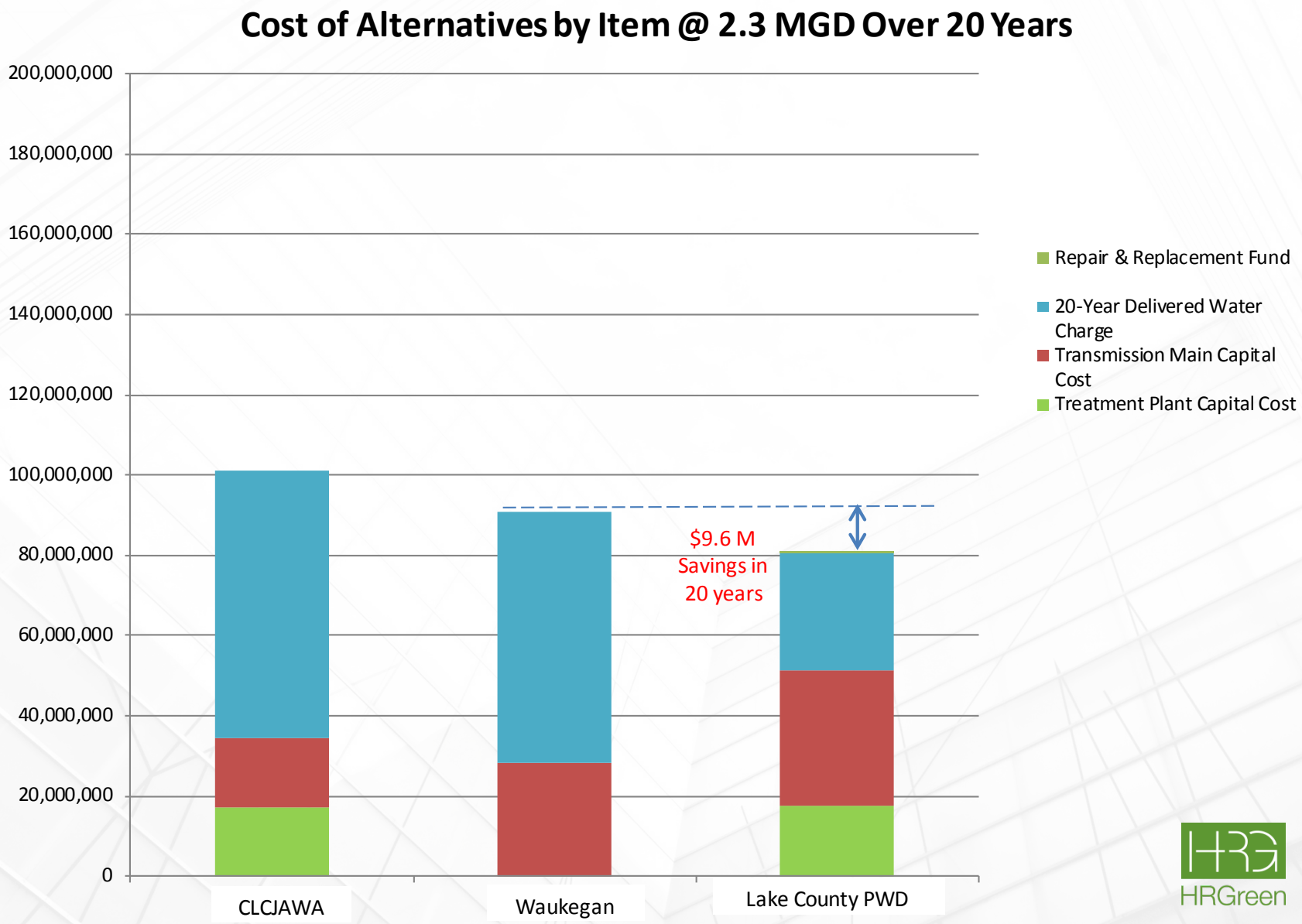
2.3 MGD Cost Summary



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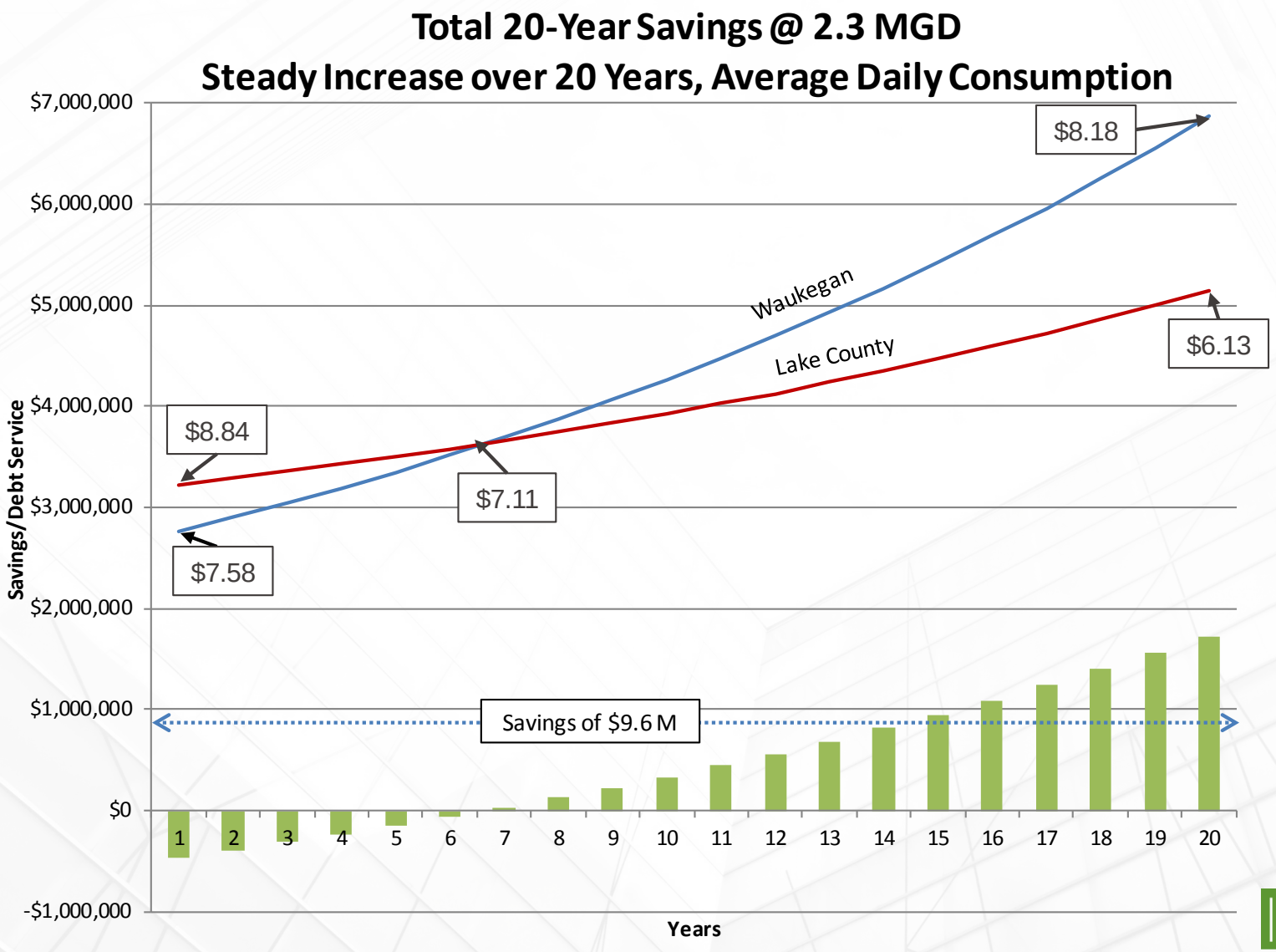
2.3 MGD Cost Summary



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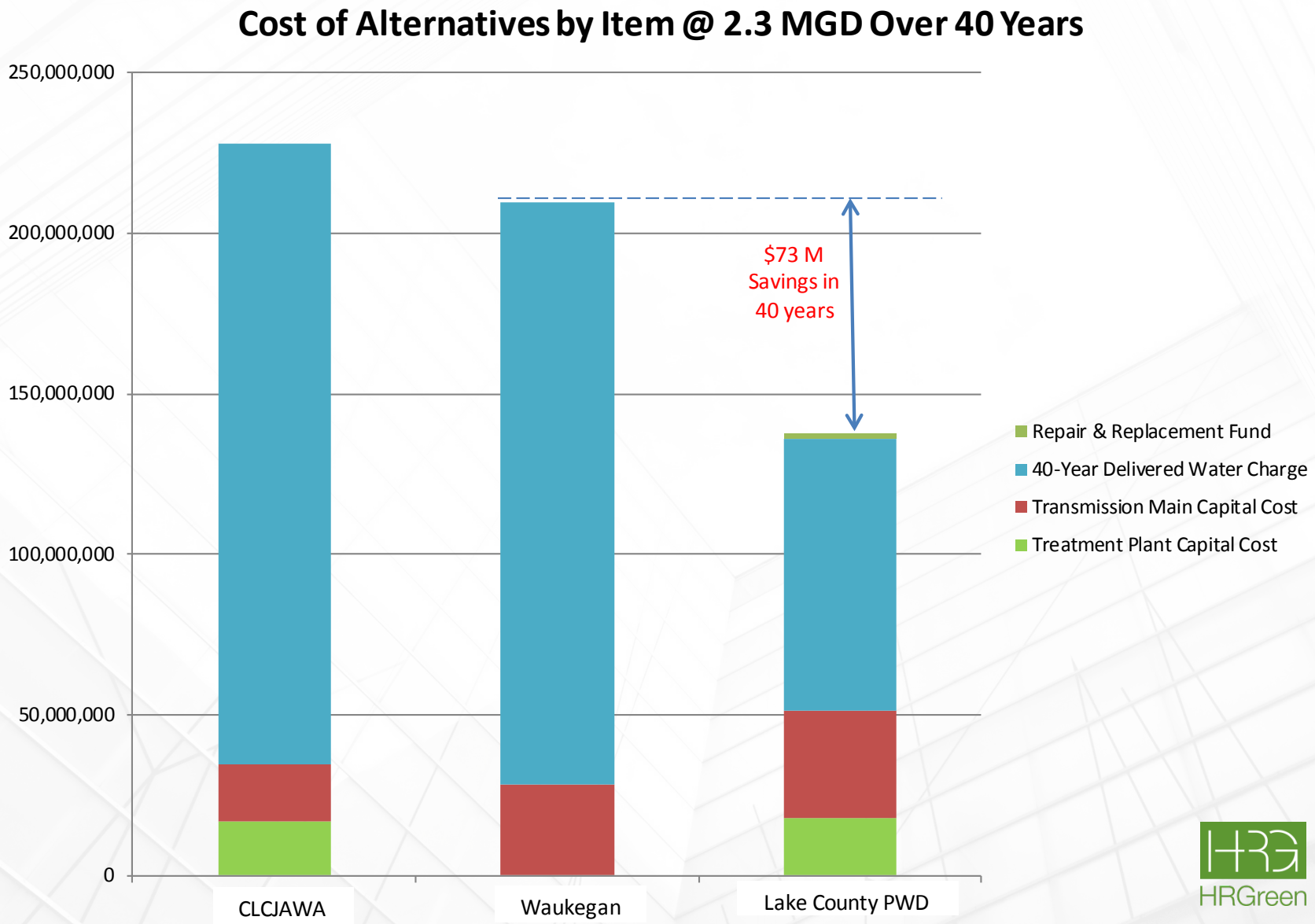
2.3 MGD Cost Summary



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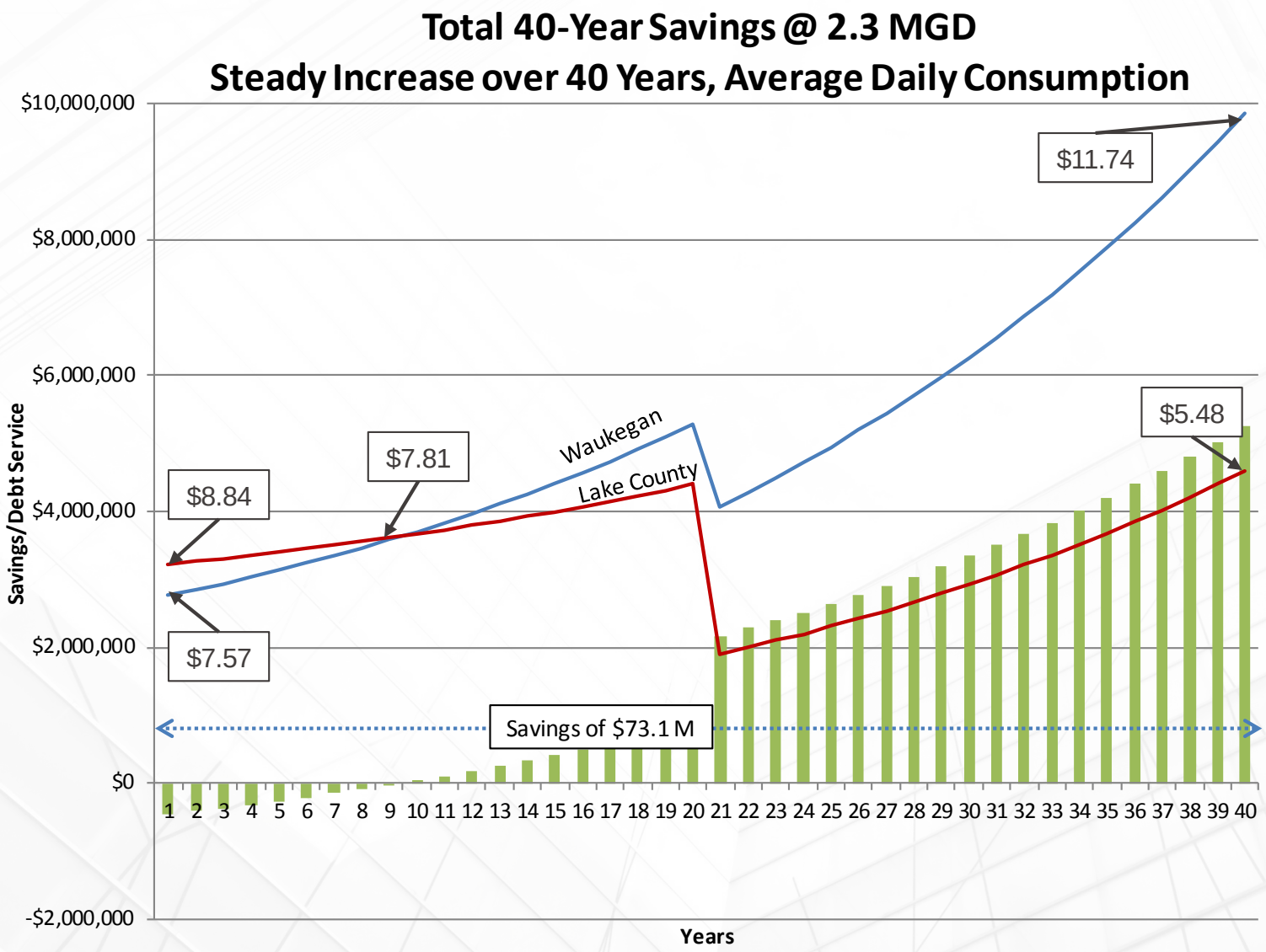
2.3 MGD Cost Summary



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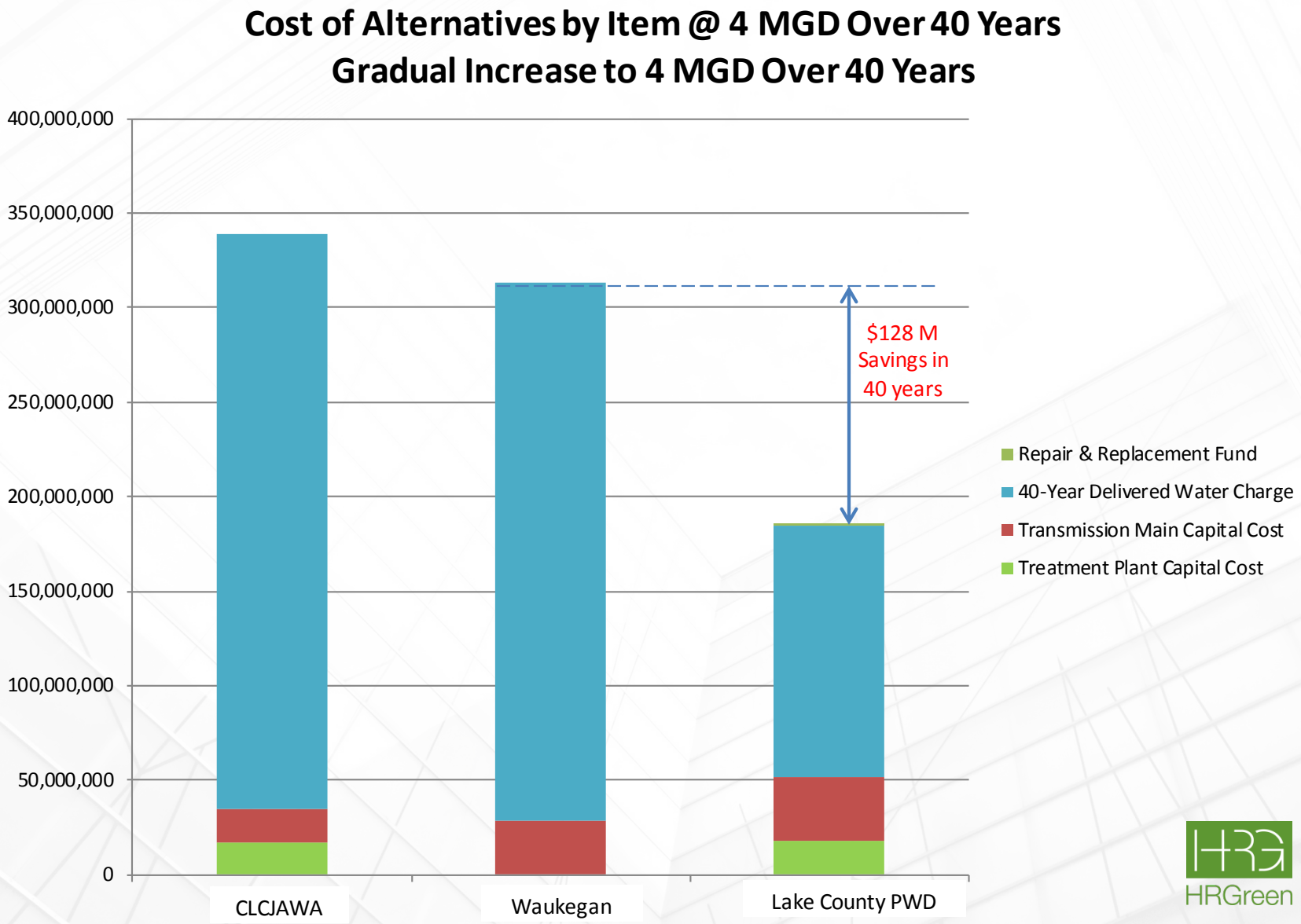
4 MGD Cost Summary



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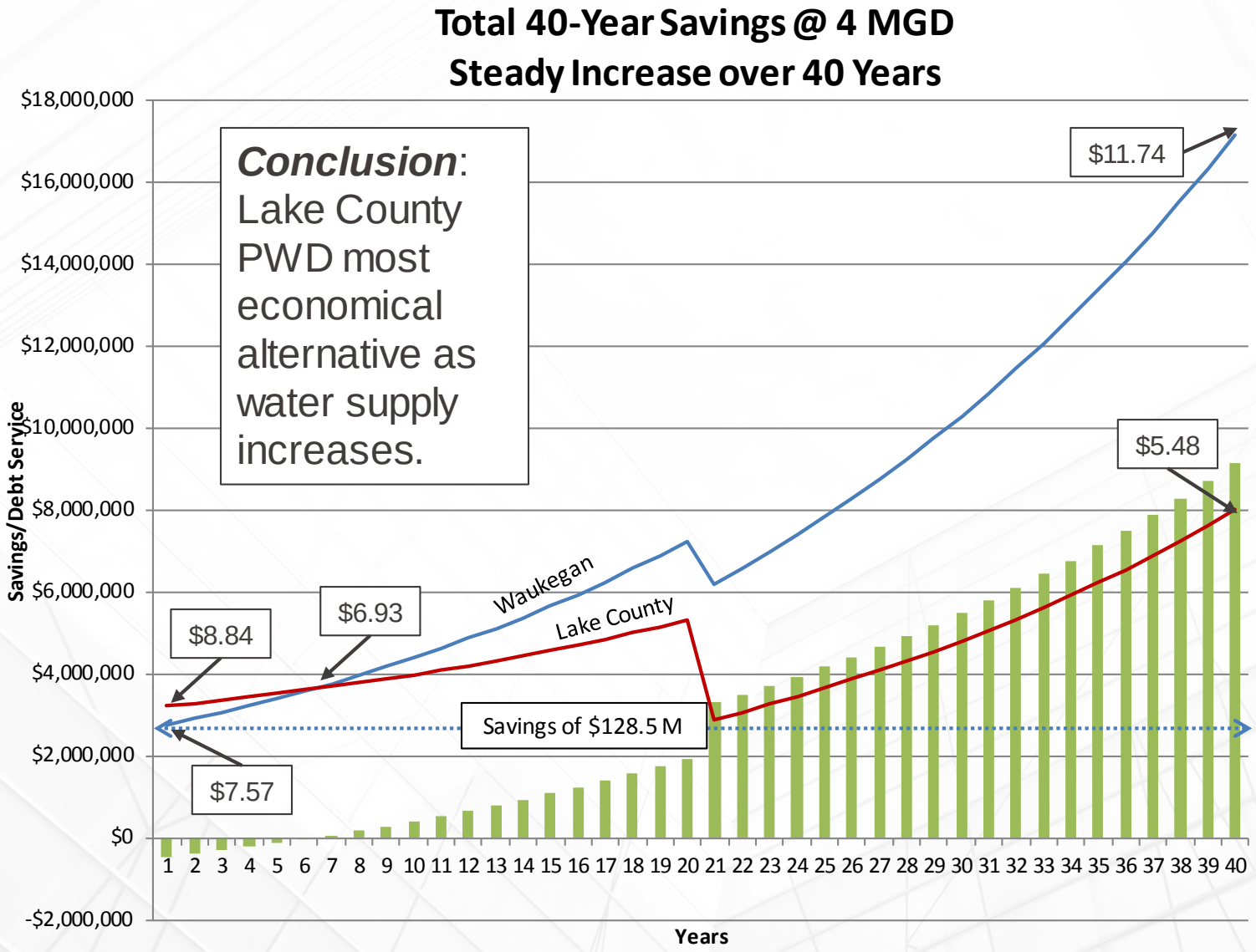
4 MGD Cost Summary



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Rate Determination, Antioch Flow Increase Alternative (No Treatment) Example Calculation

- Antioch
  - Capital Cost (Cost for transmission main, 5 new wells, storage tank)

    CC = (A/P, i, N)** where A/P = 0.06722, i = 3%, N = 20 years

    CC = ($9.61 M) * (0.06722) *

    CC = **$658,406**

  - Water Fee

    WF = (Flow* $/1,000 gal * 1.03^Years * 365 days) / 1,000 gal

    WF = (4,000,000 gal * $3.58/1,000 gal * 1.03^1 * 365 days) / 1000 gal

    WF = **$1,345,901/year 1** (current value)

  - TOTAL RATE = CC + WF
  - TOTAL RATE (Year 1, 4 MGD) = $806,066 + $1,345,901
  - TOTAL RATE (Year 1, 4 MGD) = **$2,004,307**

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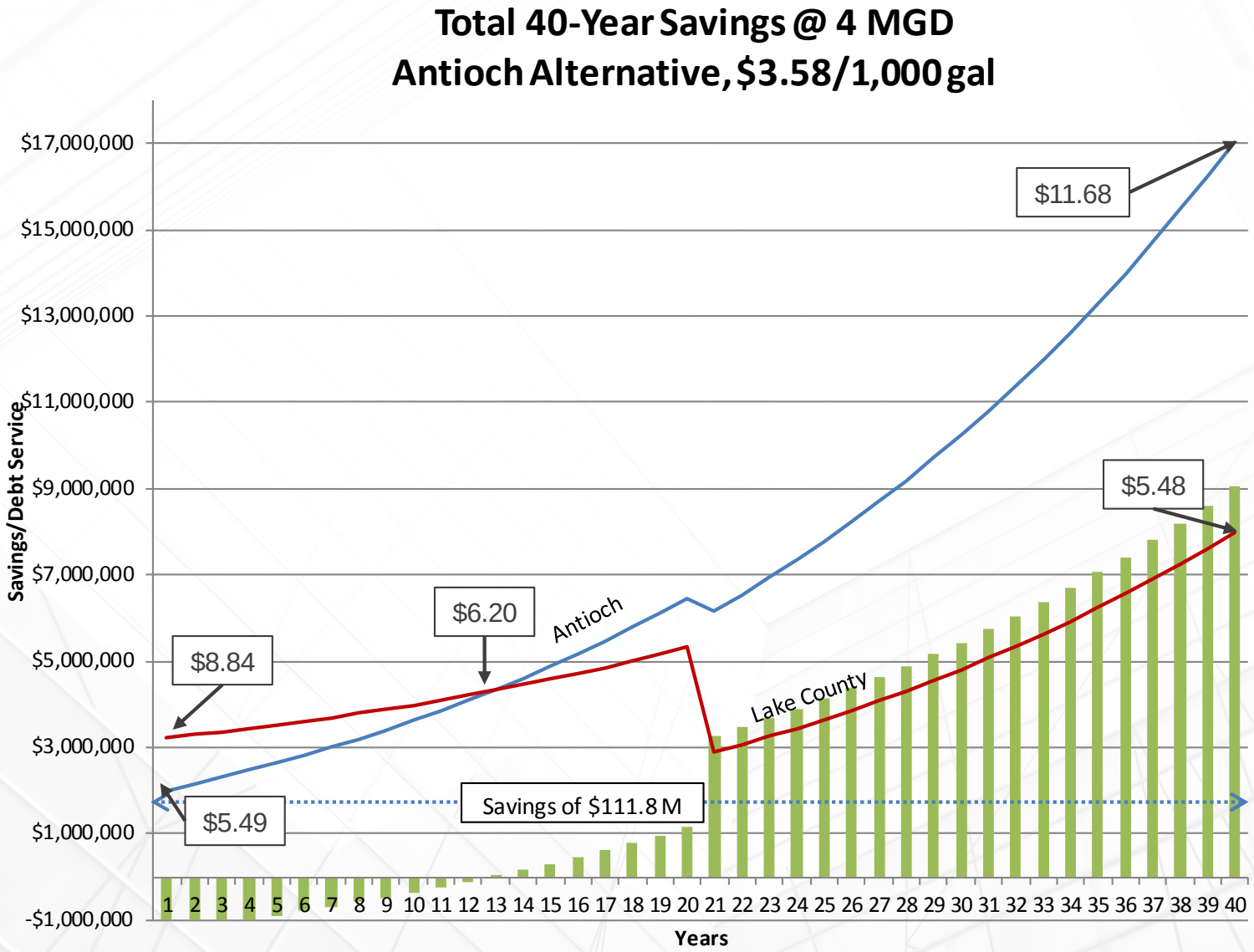
4 MGD Cost Summary



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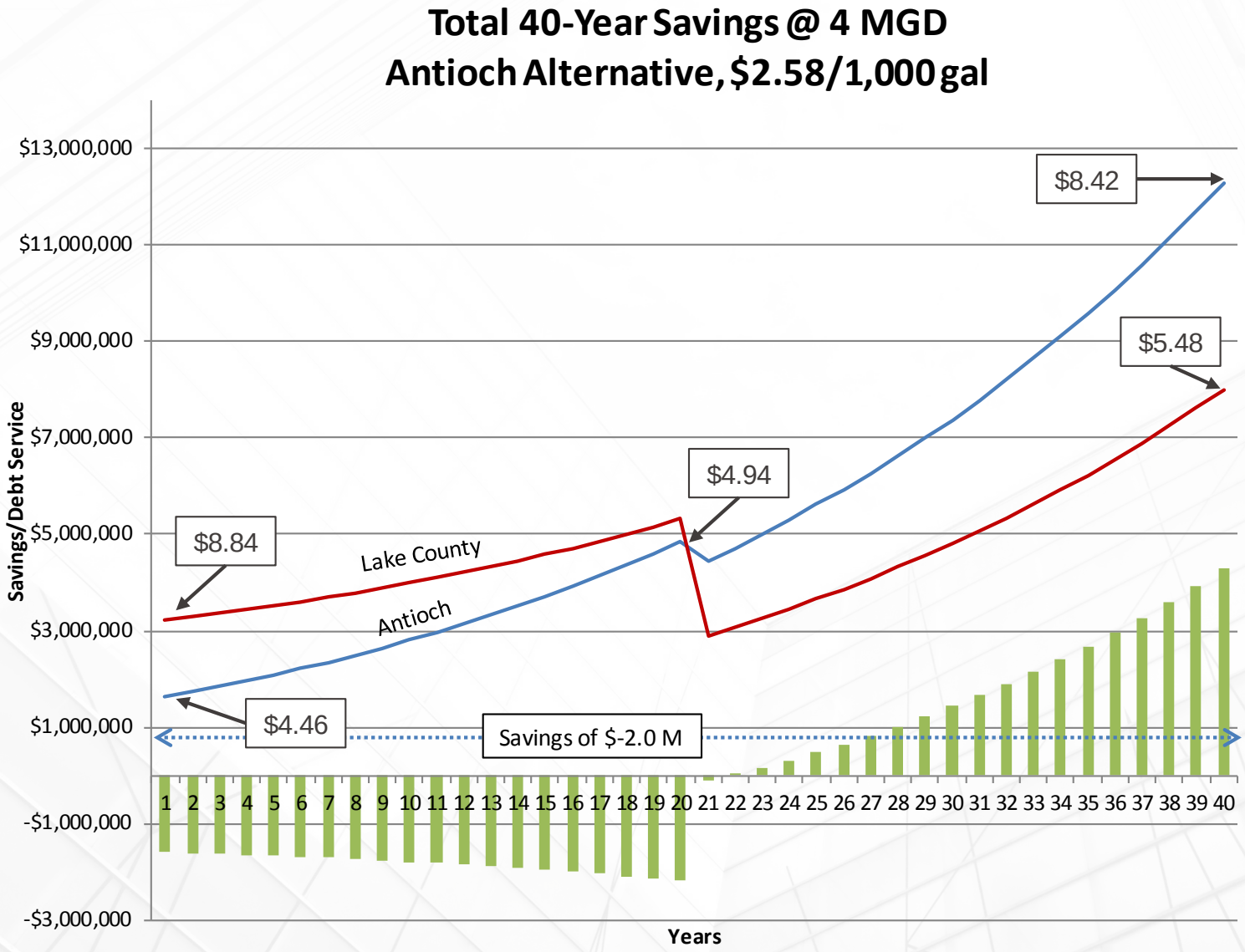
4 MGD Cost Summary



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Water Quality Analysis

Many drinking water contaminants can be decreased by switching to a Lake Michigan supply:

- Hardness
- Sulfate
- Sodium
- Iron
- Radium
- Barium
- Arsenic

These contaminants can effect both aesthetics and long term health.

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Water Quality Analysis

(To be Inserted)

- Antioch
- CLCJAWA
- Waukegan
- LCPWD

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Thank you!

QUESTIONS OR COMMENTS?

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