Phased Approach for New Water Supply

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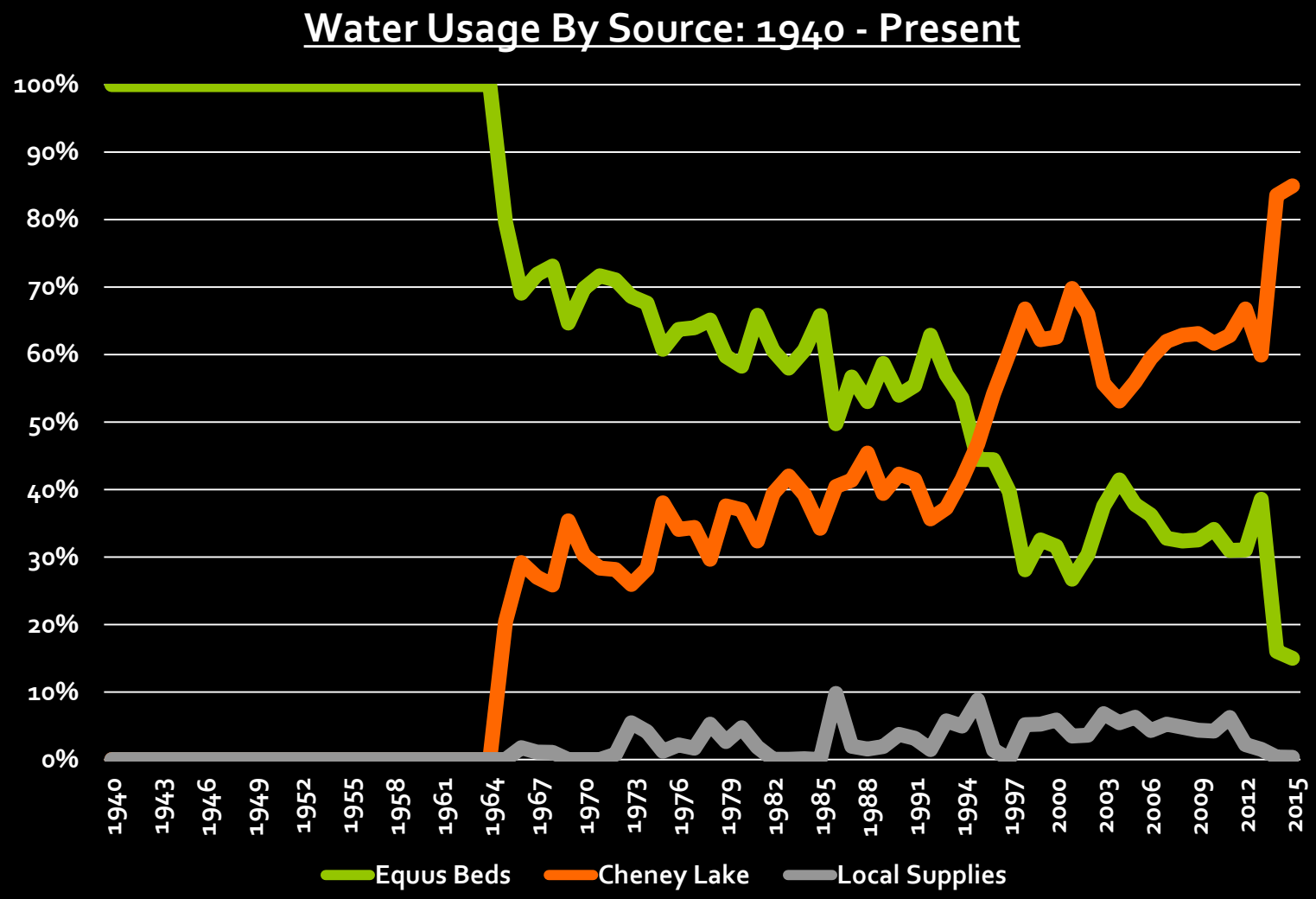
History of Discussions

- **Previous water resources plan – known as the Integrated Local Water Supply Plan – completed in 1993**
- **Team of consultants, economists, and staff involved in the current process**
- **Public input generated last year**

- **September 2012:** Began water resources planning analysis
- **October 2013:** Adopted Drought Response Plan
- **December 2013:** Finished discussions with Chamber Committee on Water Resources
- **April 2014:** Initial water supply options presented to Council
- **May – July 2014:** Consideration of water supply options as part of Council Strategic Planning efforts
- **August – November 2014:** Community consideration of full ASR enhancement project

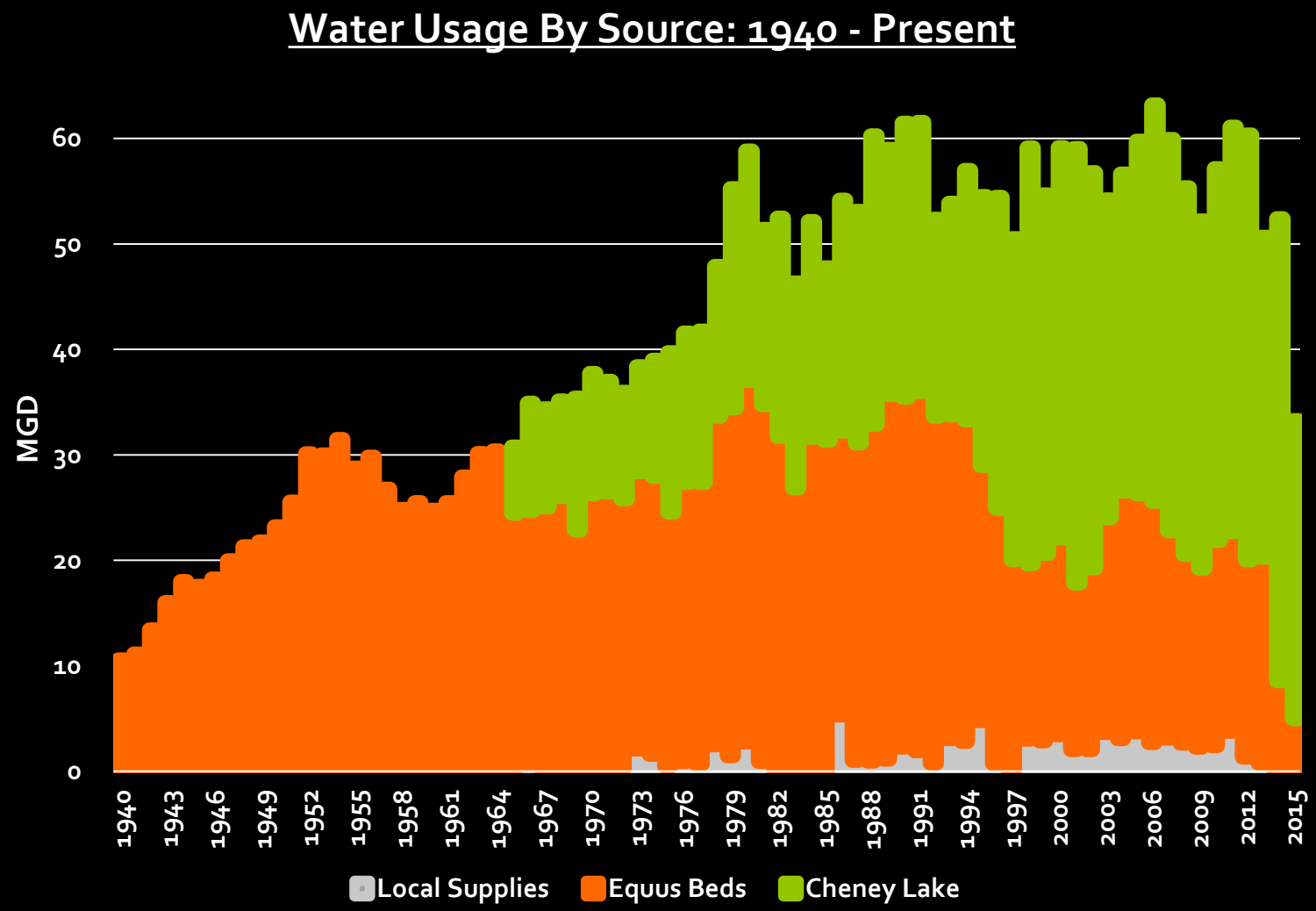
Current Water Supplies

- Two main sources supply Wichita with water
- Equus Beds includes senior water rights that date back to 1940 and water produced through ASR
- Mix is changed based on supply conditions and is currently more than 80% from Cheney Lake



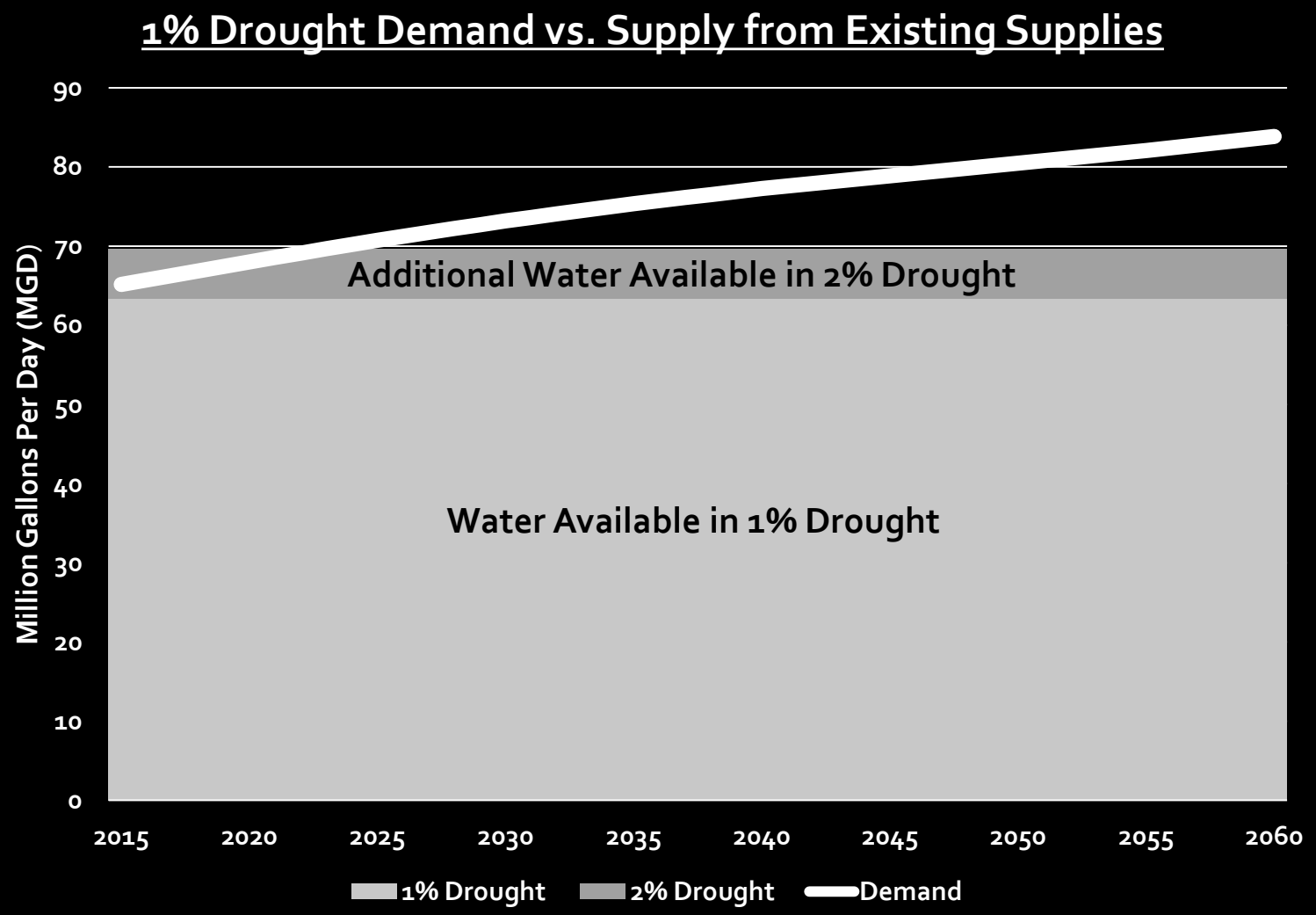
Current Water Supplies

- Demand increased gradually through the 1980s
- Growth rate in total demand has slowed over the past 30 years
- City is using less Equus Beds water now than at anytime since the wells were first tapped 75 years ago



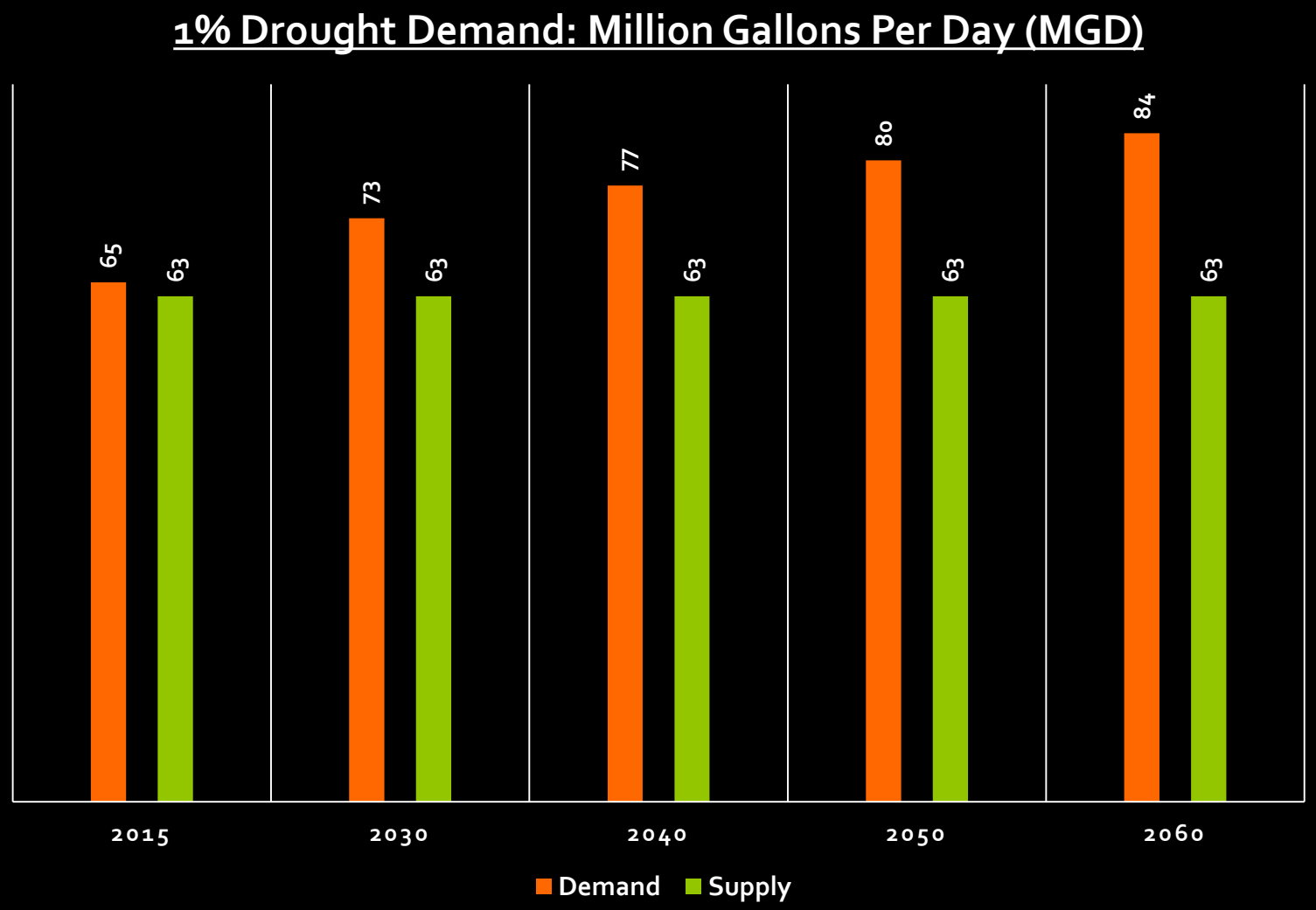
Drought Tolerance

- A 2% drought is a six year drought similar in severity to the 1950s
- A 1% drought lasts eight years and is similar to the Dust Bowl from the 1930s
- City decided on a 1% drought tolerance last year to provide greater water supply resiliency



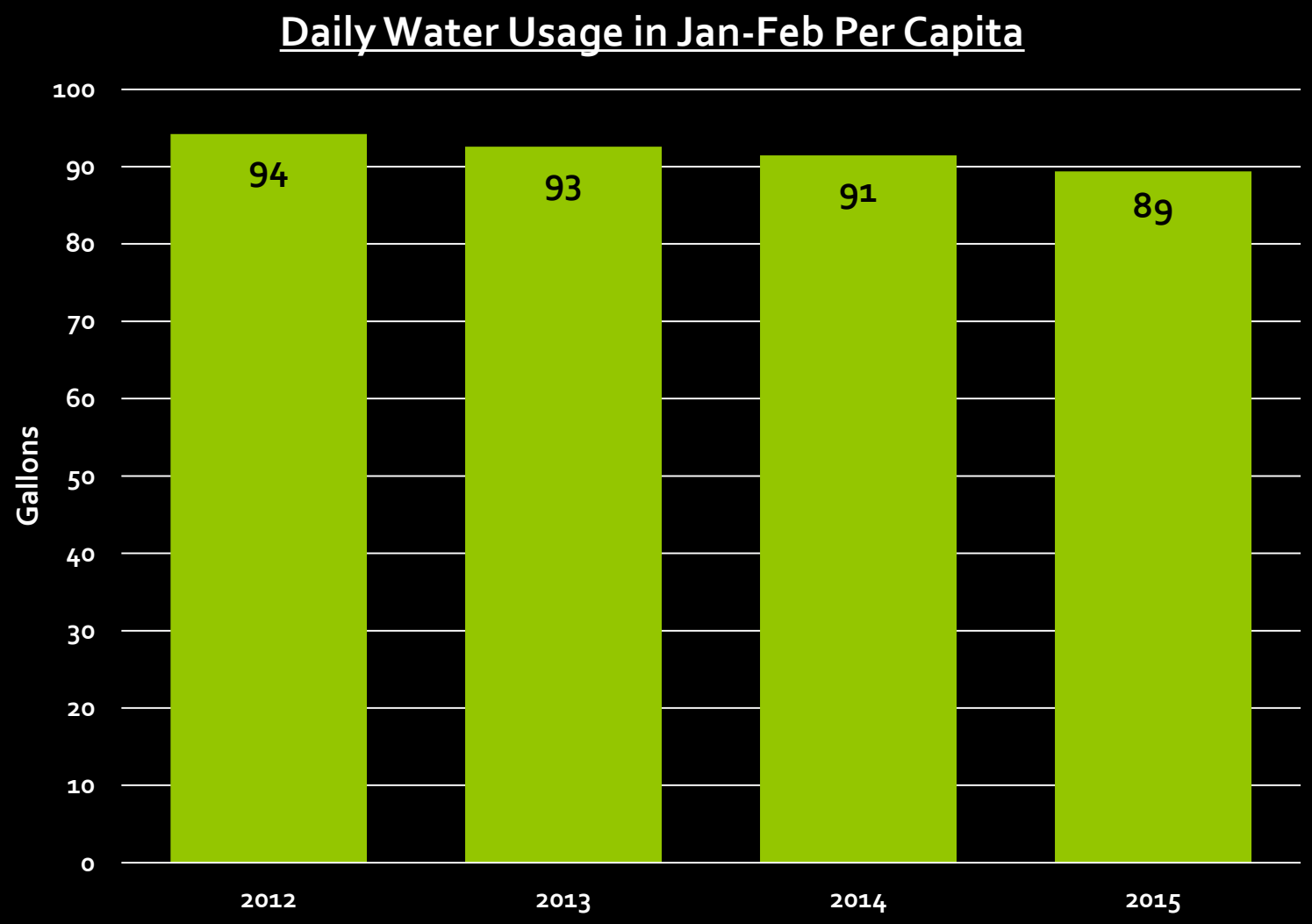
Planning Horizon

- Necessary water resources are dependent on the length of time in the planning process
- Goal of Water Resources Plan is to provide sufficient water through 2060
- Syncs with timelines in State's water planning efforts



Achievable Conservation

- Water conservation is important approach in long-term strategy
- Targeting 0.35% annual water conservation to reduce the need for new water supplies
- Previous efforts have reduced base demand over past five years

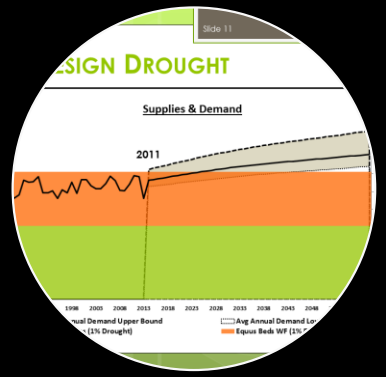


New Water Supply

- Numerous engineers and data sources have been included in the planning process
- Independent firms were consulted to test modeling and assumptions
- City's water resources approach validated by third-party experts

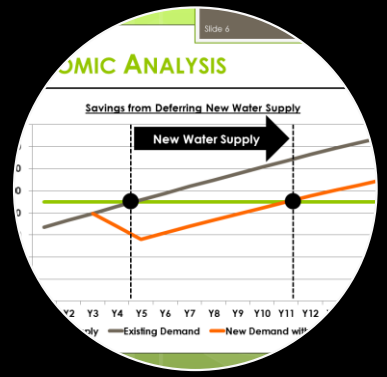
Data

- Metro Area Planning Department
- Colorado St. University
- US Geological Survey



Engineers

- PEC
- High Country Hydrology
- SAIC
- Burns & McDonnell



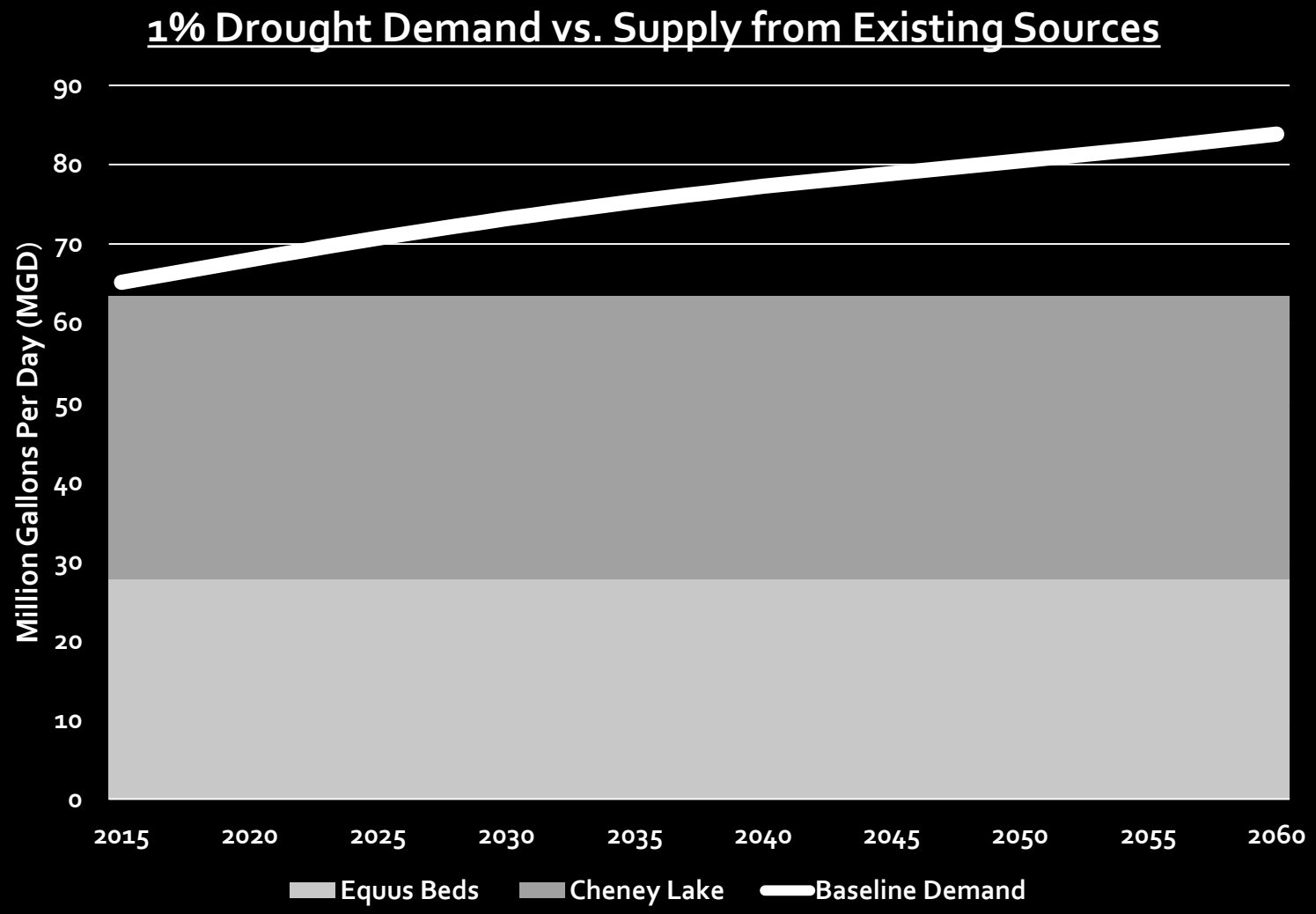
Economists

- Water Tech. Consultants
- WaterDM

Previous Planning Efforts

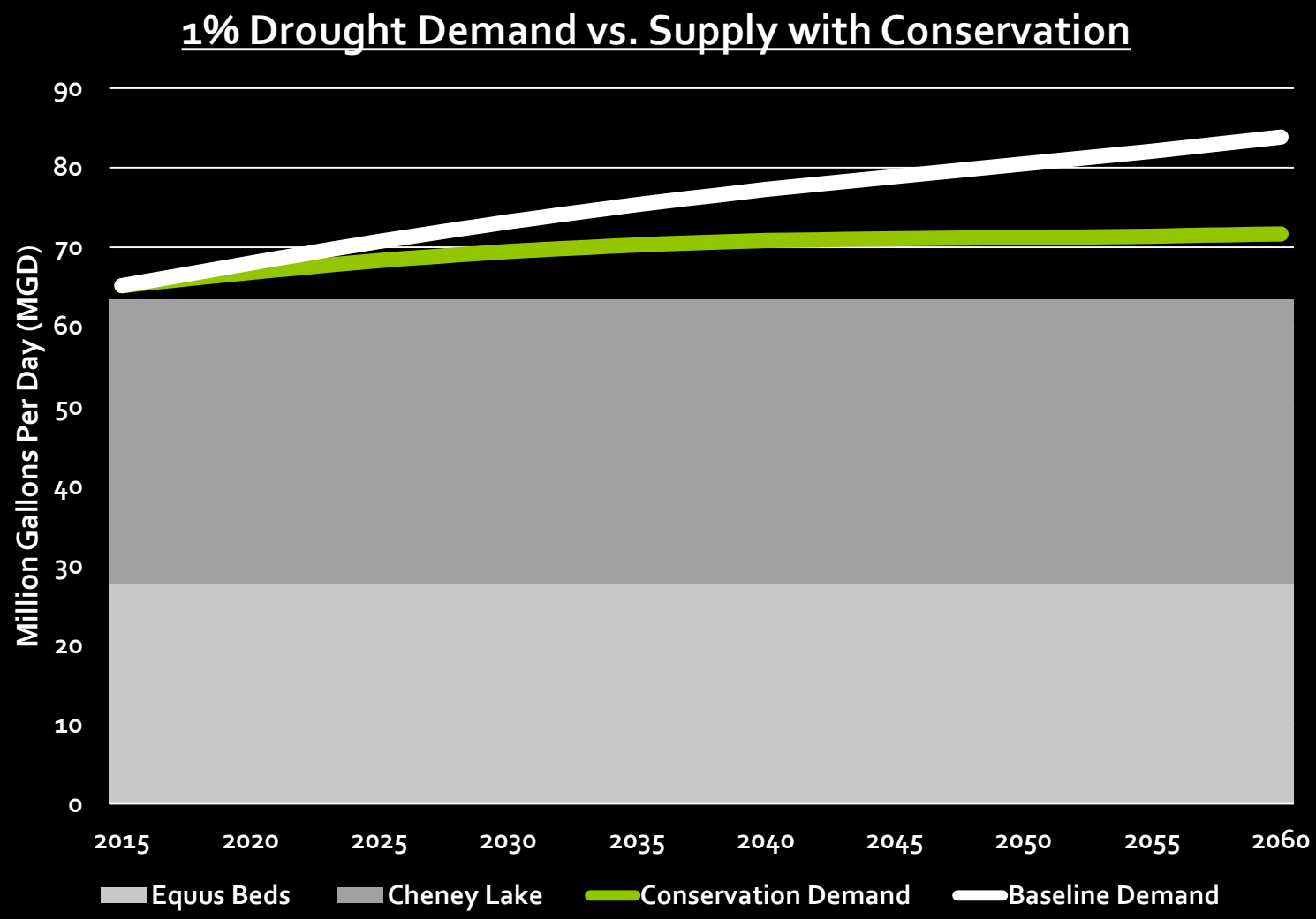
Step #1 Exist. Supply

- First step in the process was to determine future water demands
- Next step was to identify how much water would be available from current sources
- Quantified the gap in the projected demand compared to available supply



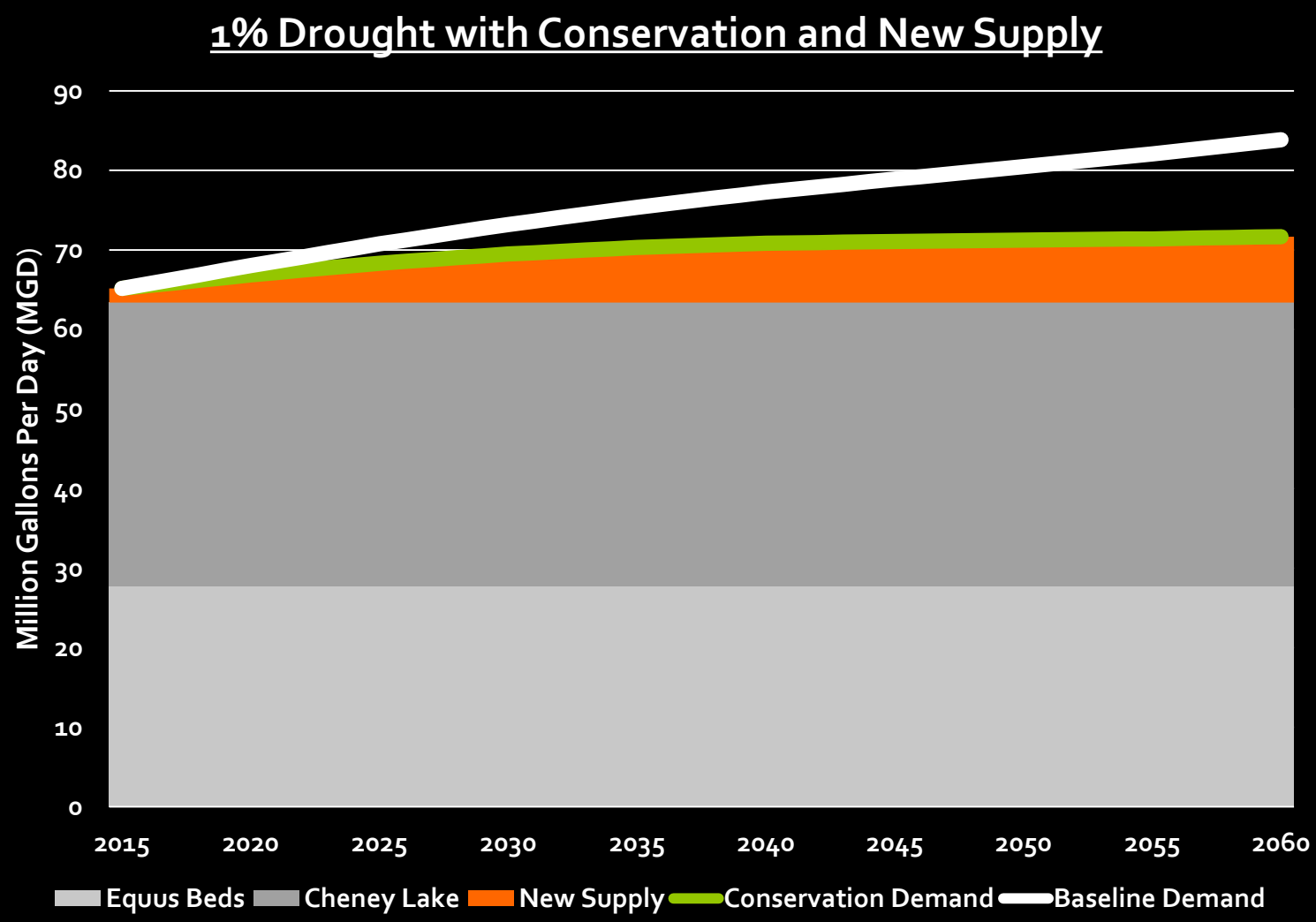
Step #2 Conservation

- Conservation can be the lowest cost strategy for closing the water supply deficit
- Must avoid cutting water usage so severely that growth in customer base cannot keep up
- Concept and model verified by independent water economists



Step #3
New Supply

- Adding new water sources is the final step in closing the water supply deficit
- Amount of new supply needed is roughly equal to how much savings is achieved through conservation
- Goal is to avoid harsh restrictions in Drought Response Plan



Current Projections

- Average annual demand is expected to grow to nearly 84 million gallons per day (MGD)
- Current sources can support about 63 MGD during a 1% drought
- Conservation strategies and new supply can jointly meet future needs

Drought Tolerance	1% Drought
Timeframe	2015 – 2060
Achievable Rate of Annual Conservation	0.35%

Projected Demand by 2060	83.8 MGD
Supply Available from Cheney and Equus Beds	63.4 MGD
Demand Deficit	**20.5 MGD**

Demand Deficit Met through Conservation	**10.9 MGD**

Amount Needed for New Water Supply	**9.5 MGD**

Drought Response

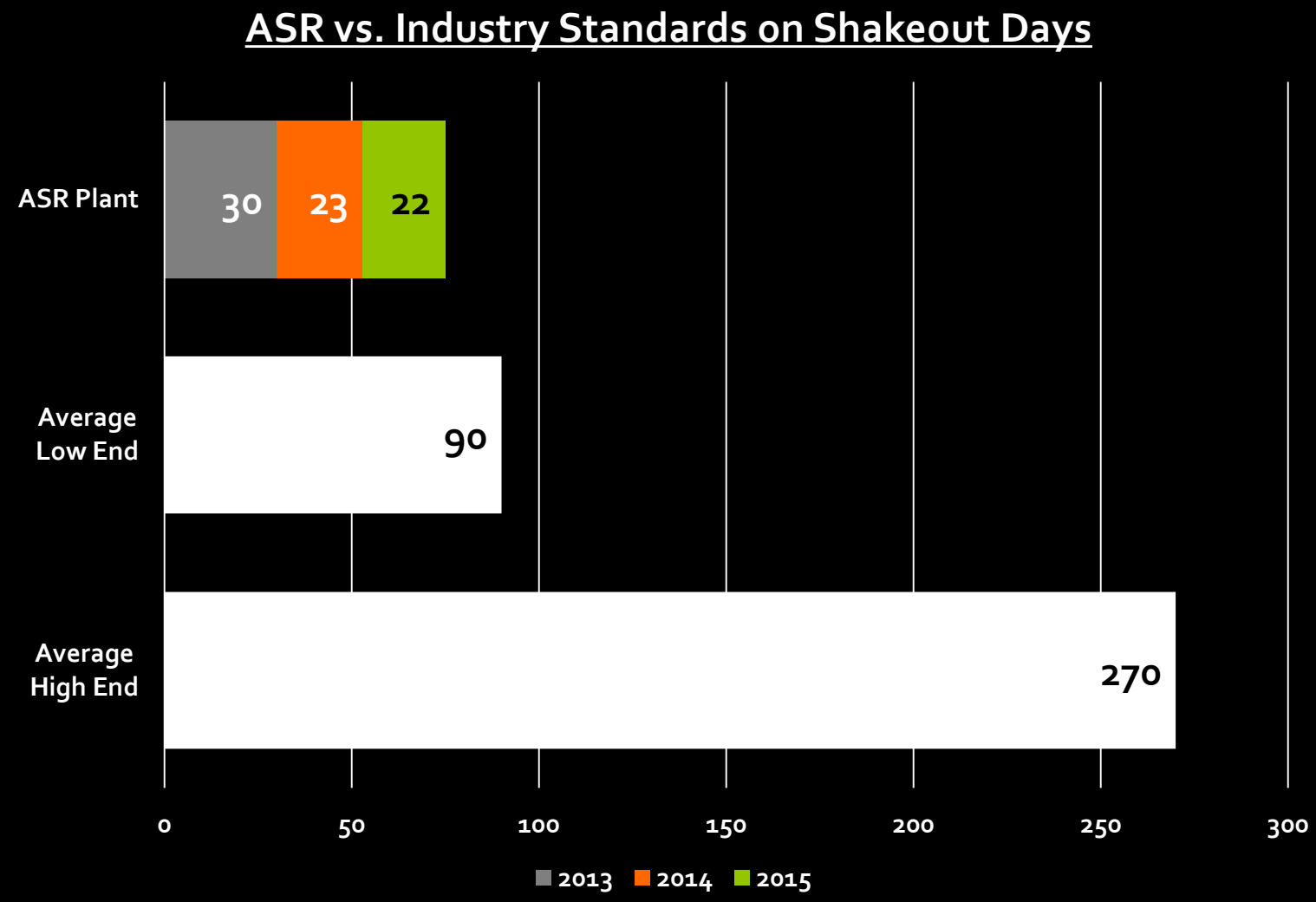
- Without new supplies, the Drought Response Plan can ensure resiliency in a 1% drought
- Plan approved in October 2013 after most recent drought concluded
- Goal of Water Resources Plan is to avoid the harsh restrictions in Stages #3 and #4

Stage	Trigger	Restriction	Exemption
1	70% - 90%	None – voluntary conservation	NA
2	50% - 70%	Outdoor watering allowed only one day per week	Food producing gardens and businesses reliant on irrigation
3	35% - 50%	All outdoor watering banned	Food producing gardens and businesses reliant on irrigation
4	Below 35%	All outdoor watering banned. Base demand reductions of 15%.	No exemptions for irrigation. Hospitals exempt from base demand reductions

Trigger is the 12-month average lake level at Cheney

ASR Shakeout Period

- Similar treatment plants have a period after acceptance testing known as a shakeout period
- Represents an intermittent number of days of operation since the plant was completed
- ASR finished its shakeout period in less time than the industry average



ASR Production

- Production at ASR can be limited by the amount or the quality of water in the river
- High quantities of atrazine and bromide can prevent ASR from running
- Anticipated annual yield discussed in 2014 is not being revised

2015 ASR Operational Results

Duration

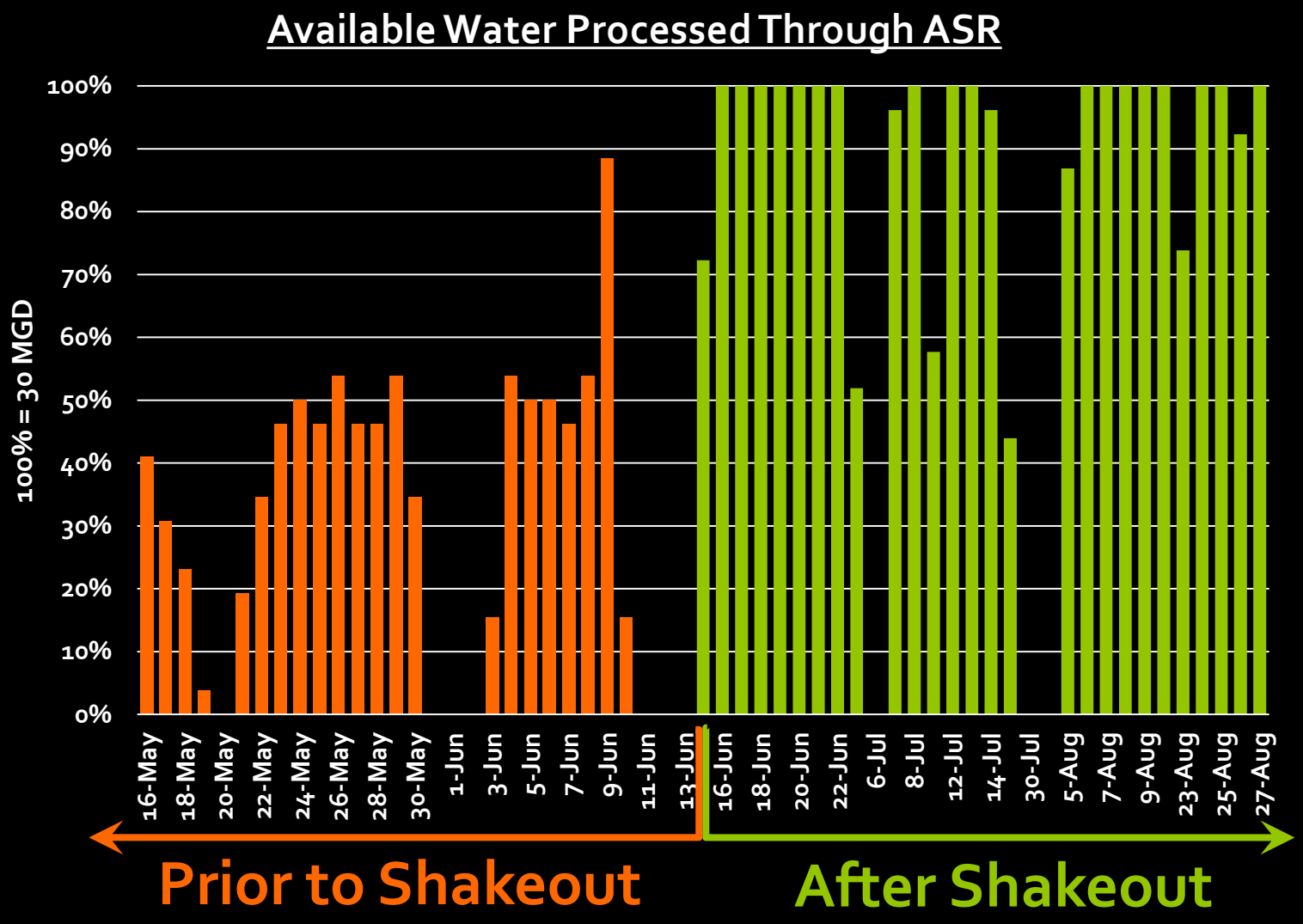
	Prior to Shakeout	After Shakeout
Potential Hours to Run	668 Hours	585 Hours
Hours Operated	400 Hours	533 Hours
Operations Ratio	60%	91%

Quantity

	Prior to Shakeout	After Shakeout
Amount of Available Water	724 MG	633 MG
Amount of Water Processed	250 MG	573 MG
Perc. Of Total Water Captured	35%	90%

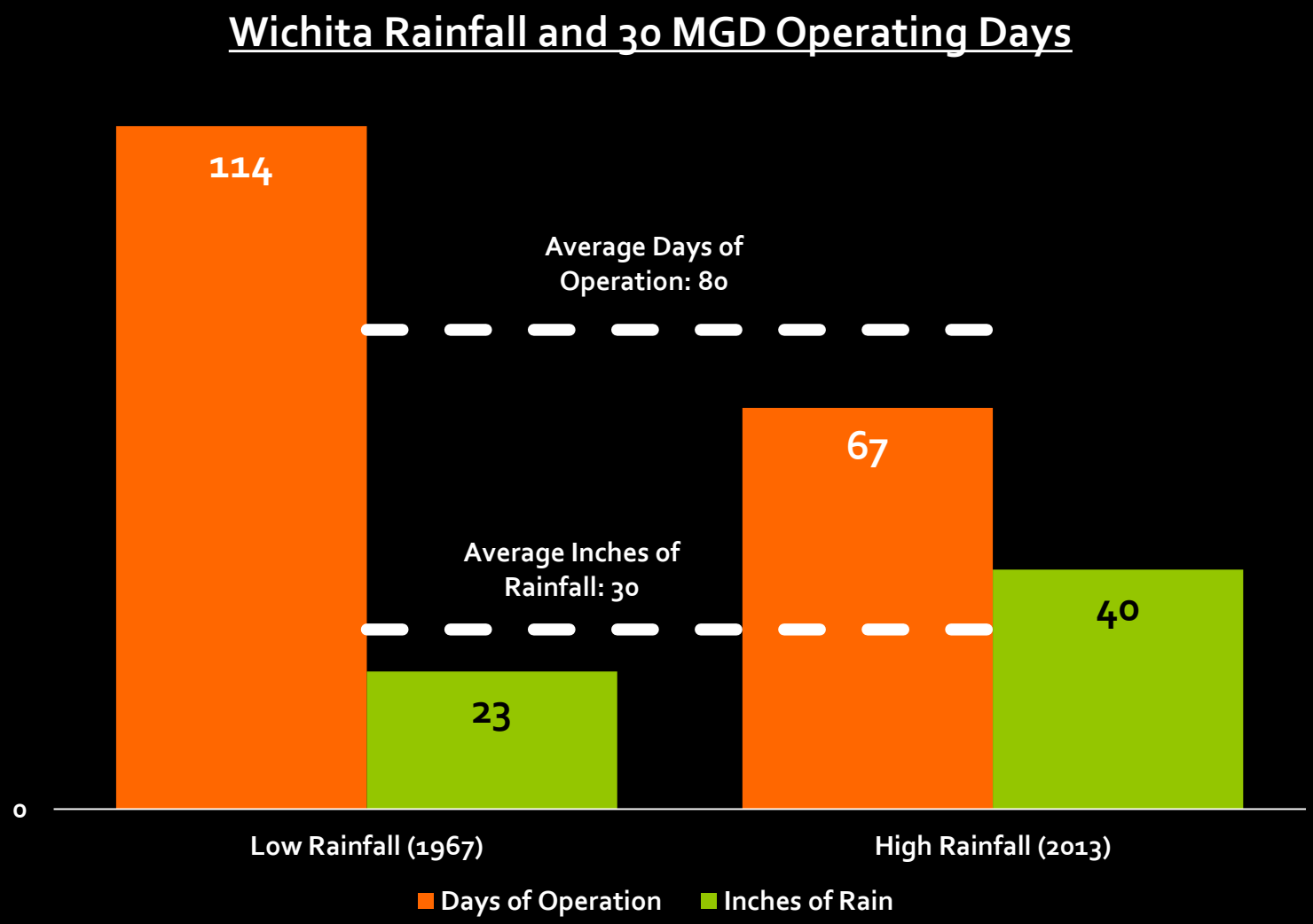
ASR Production

- Major changes have improved operations this summer
- Ability to process full amount of available water has become more reliable through operational changes
- Around 90% of the available water has been processed since mid-June



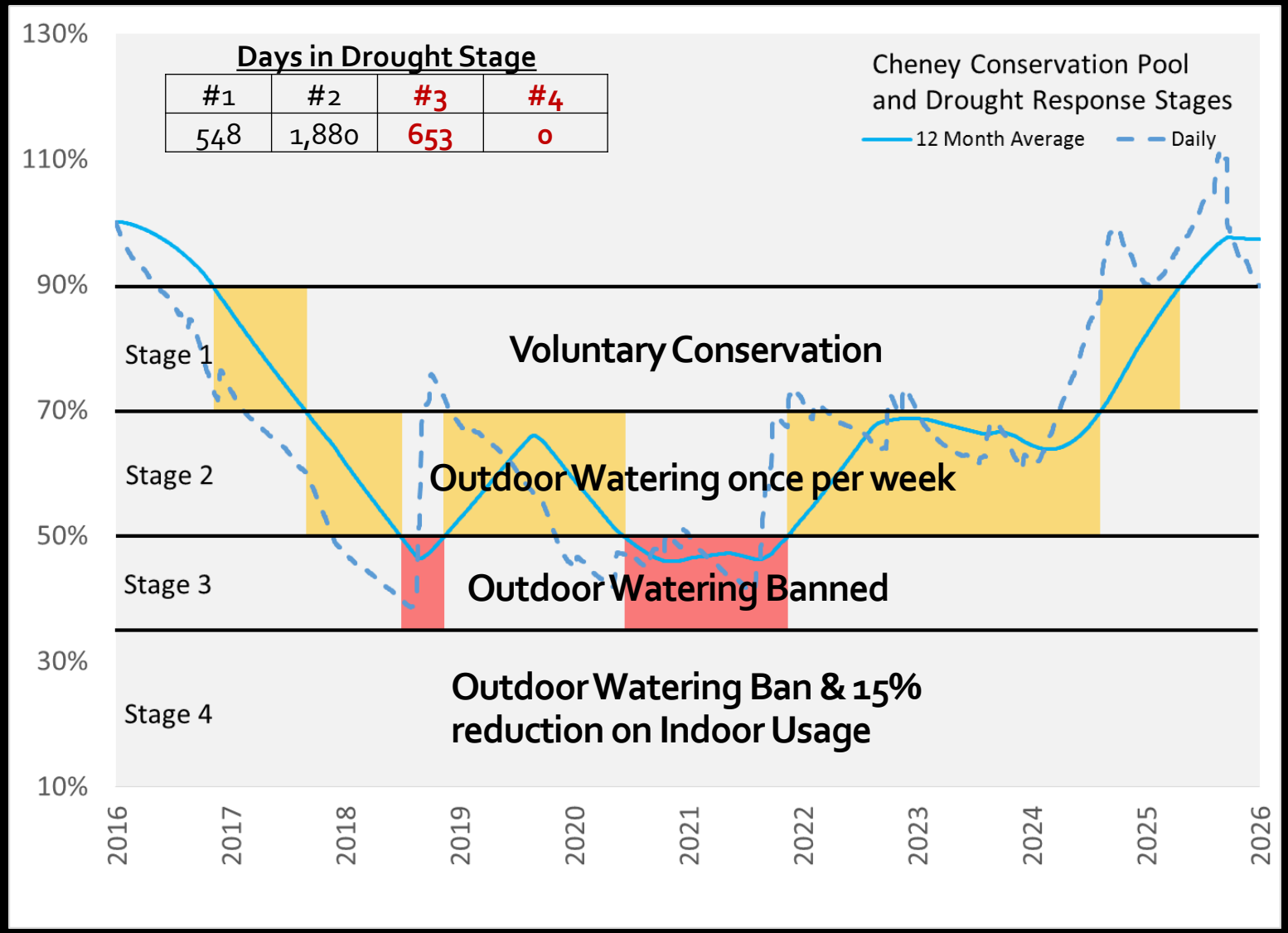
ASR Rainfall Impact

- Annual rainfall totals in Wichita do not correlate to the number of days that ASR can operate
- Duration, volume, and timing of the rains influence water availability
- Rain must also be located in the watershed north of Wichita



Outcomes without ASR

1% Drought Starting in 2016



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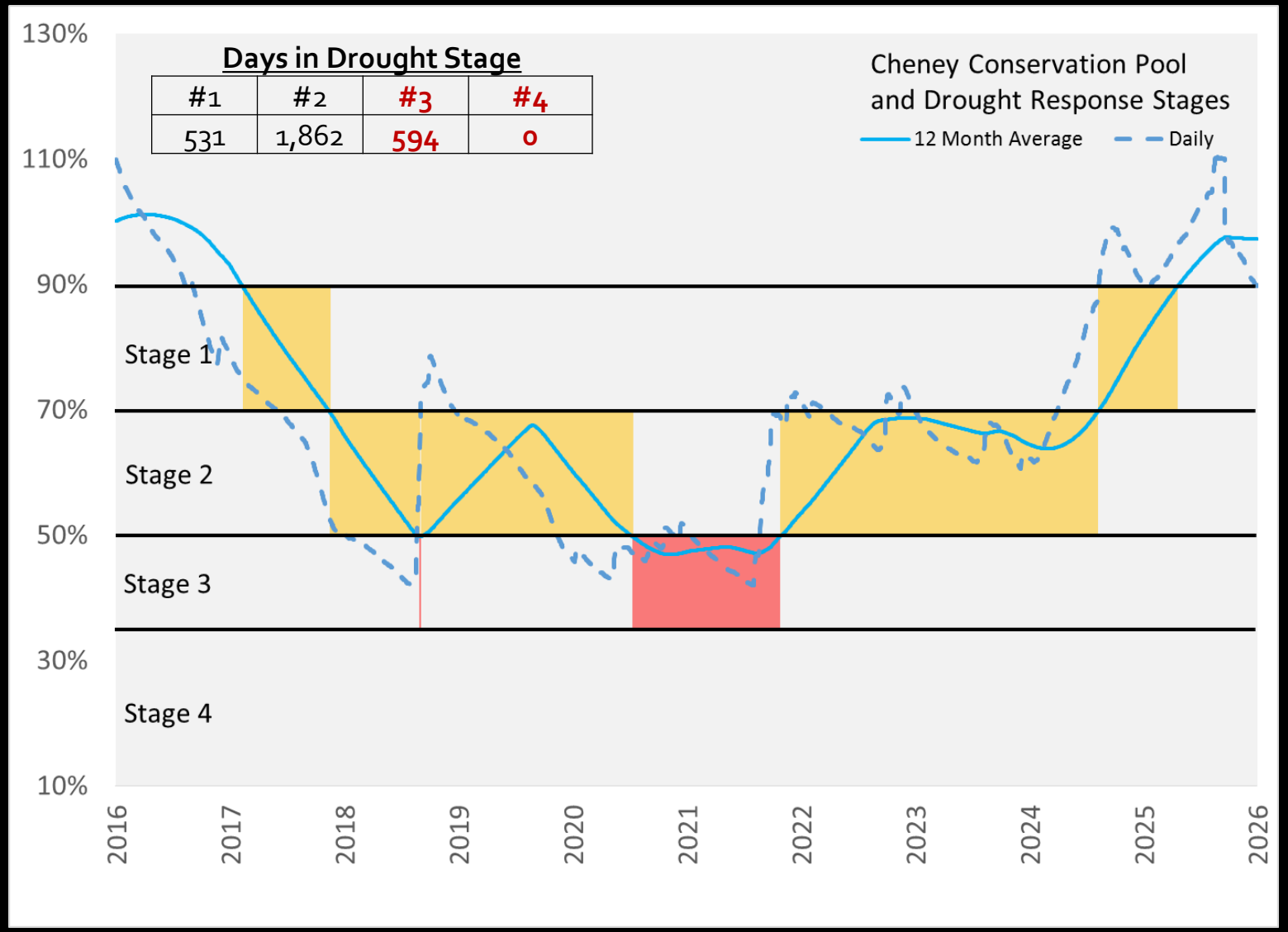
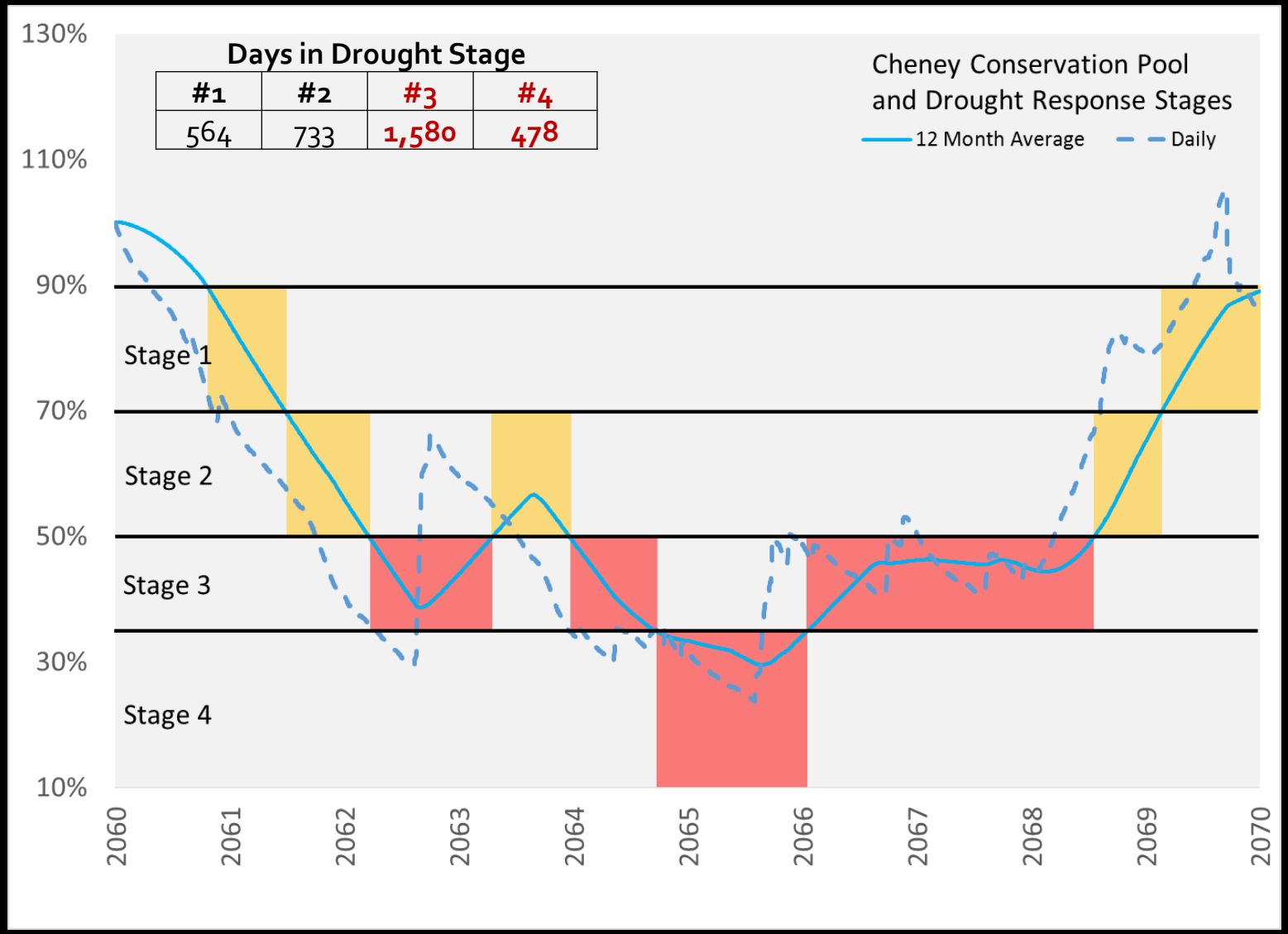


Outcomes without ASR

- Models show how system would react if ASR had never been built
- A drought starting in 2060 would trigger almost six years of harsh water restrictions

1% Drought Starting in 2060



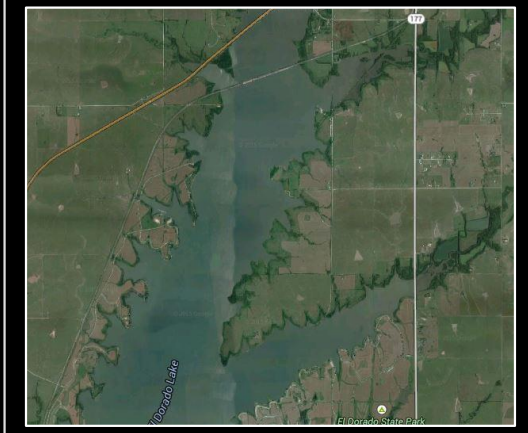
New Supply Options

- Full ASR improvements presented last year are still an option
- Additional analysis has been conducted on the feasibility of El Dorado Lake
- Council direction in early 2015 to develop a phased plan of water source improvements

ASR Plan

Full Improvements Constructed at Once

El Dorado Plan



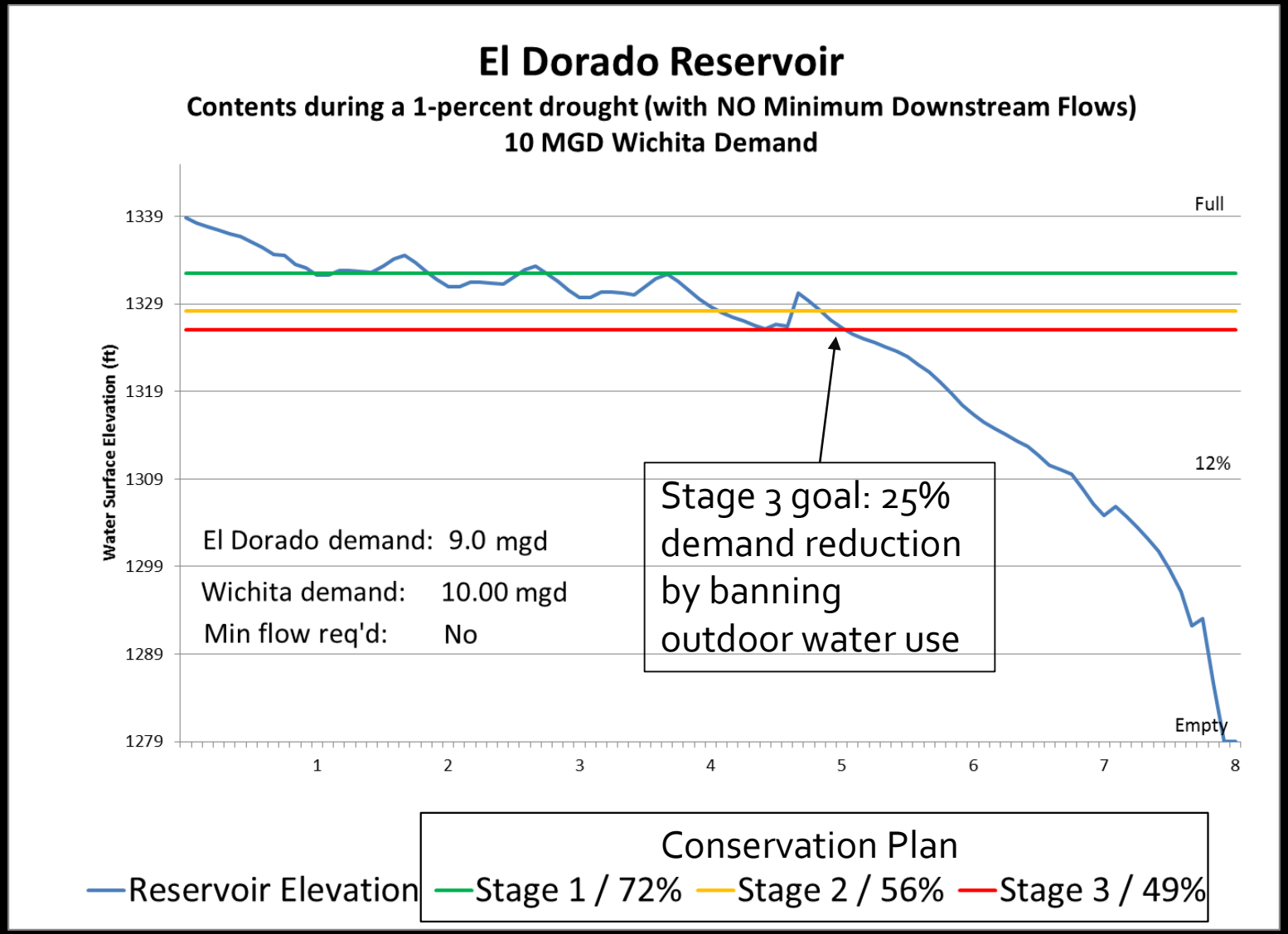
Continuous Flow Provided to Wichita

Phased Plan

Incremental Improvements Over Years

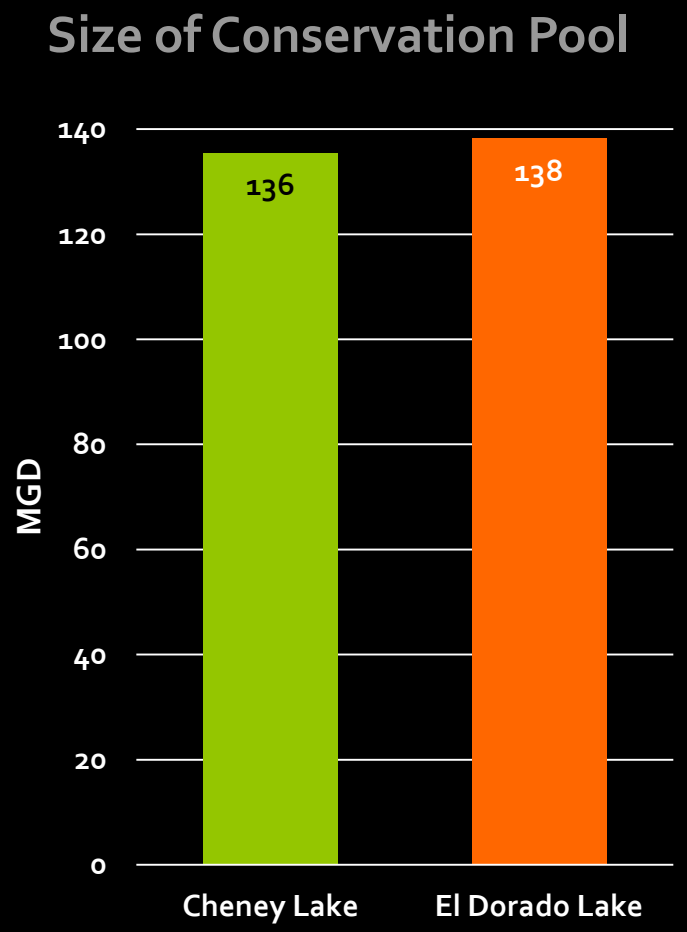
El Dorado Analysis

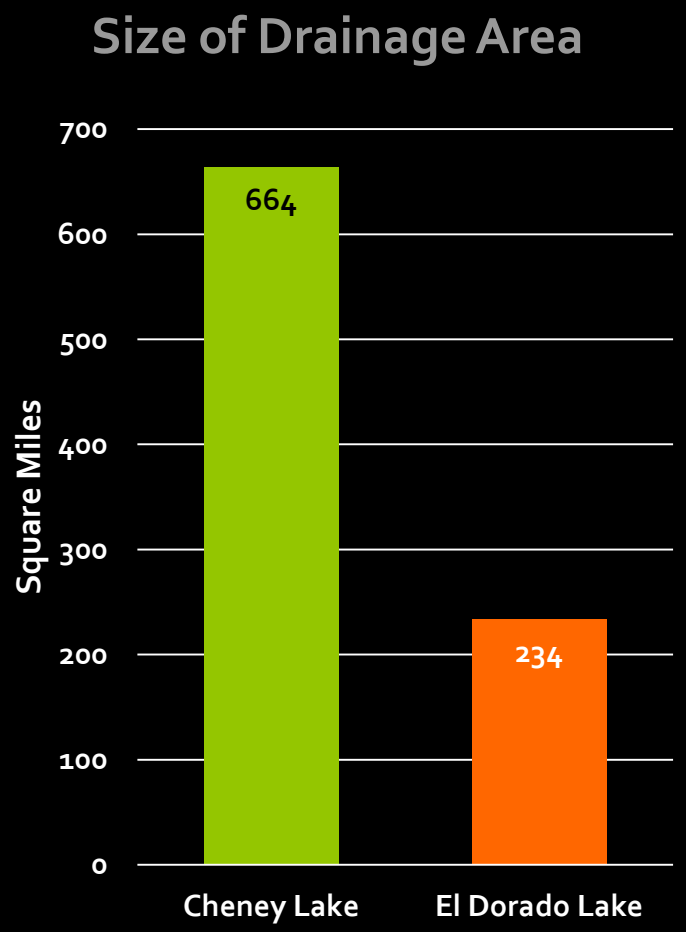
- Drought of Record at El Dorado Lake not a 1% design drought
- High Country Hydrology developed a simulated 1% drought on the lake
- Implementing its Conservation Plan, El Dorado Lake cannot supply sustained 10 MGD to Wichita with current customers



El Dorado Analysis

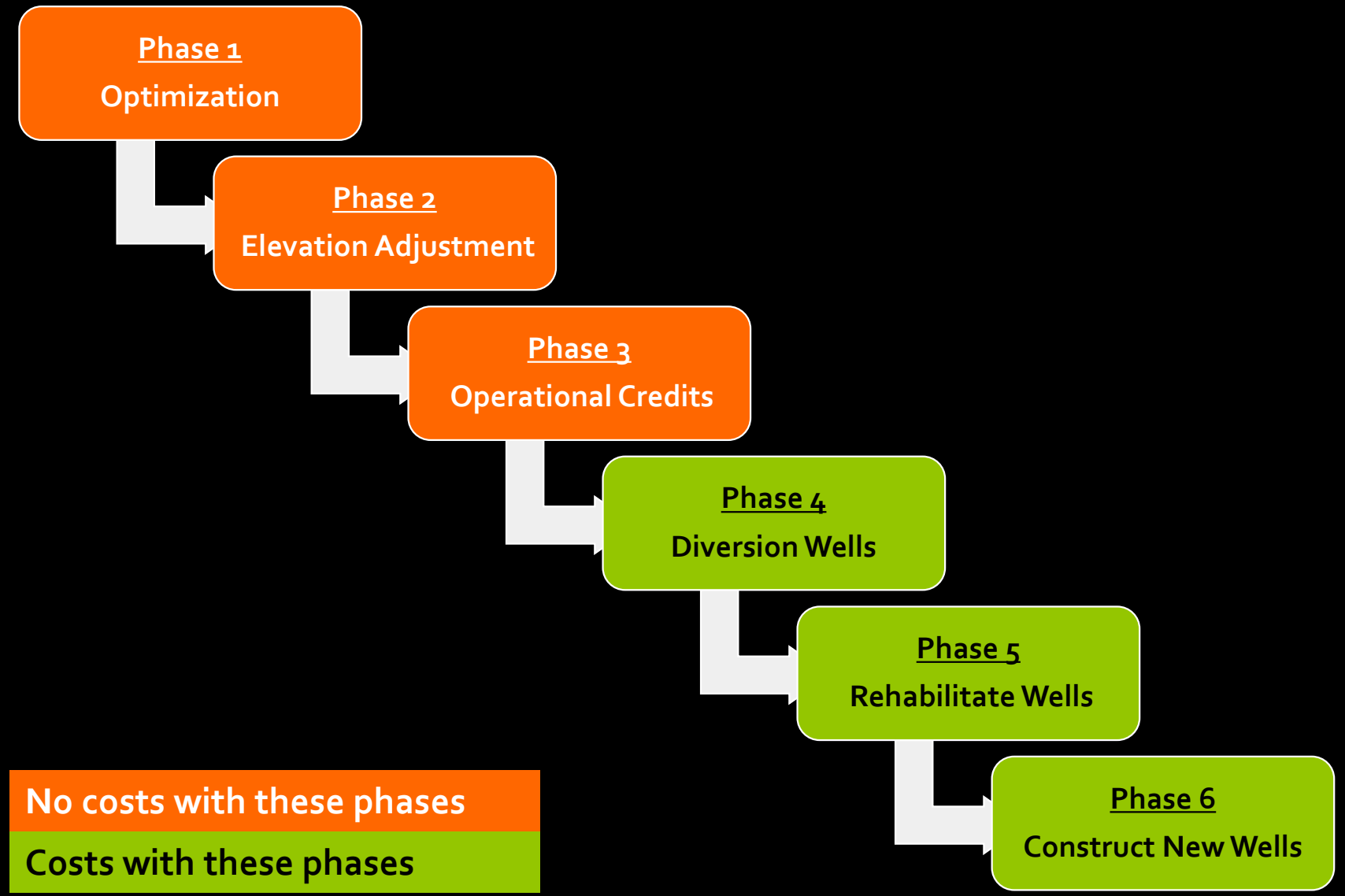
- The contributing drainage area around El Dorado Lake is 35% the size of the drainage area serving Cheney Lake
- Smaller drainage area means it takes nearly three times as much rain for El Dorado Lake to realize the same inflow rates as Cheney Lake experiences





Phased Water Plan

- First three phases are currently underway
- Ensure maximum benefit out of existing ASR
- Changes state regulations
- Provides time to gradually introduce components
- Also relies on CIP project to upgrade treatment plant



Early Phases with No Cost

- **ASR facility is being optimized for long-term benefits**
- **Two components of the State's regulations are being proposed for revisions**
- **Regulatory changes are a no-cost way for the State to assist with the City's water supply efforts**

Phase 1: Optimization

- Shake out process ongoing to ensure reliability of existing system
- Spare parts being procured, along with on-call contracts
- Optimizing regular asset management and maintenance plans
- Minimizing limitations to water quantity and quality

Phase 2: Elevation Adjustment

- Working with State of Kansas to adjust downward the bottom elevation governing the use of recharge credits
- Will allow for use of ASR water during droughts

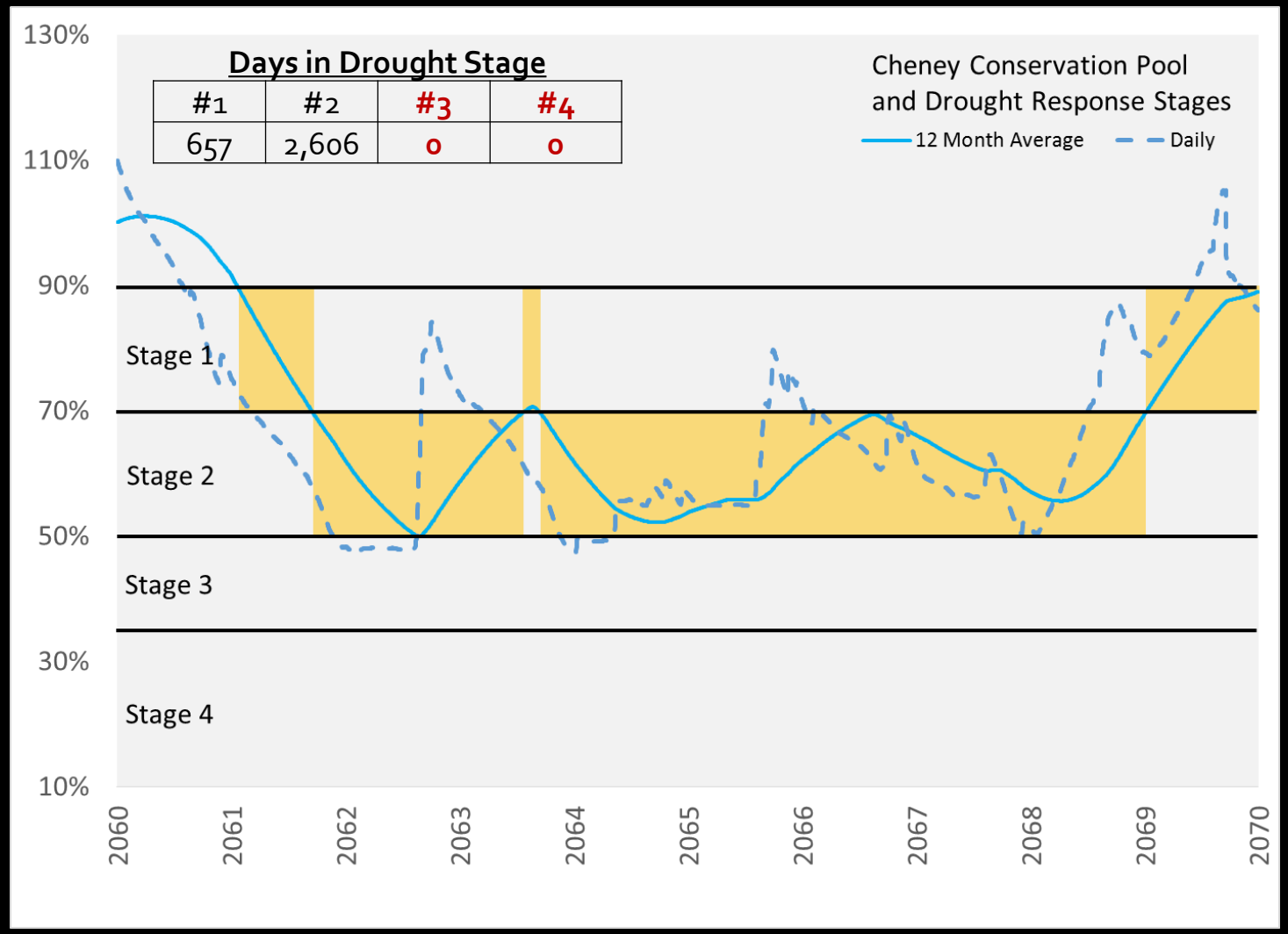
Phase 3: Operational Credits

- Pursuing a regulatory change with the State Engineer.
- Would provide future use credits for water processed through ASR and sent directly to town.
- Could eliminate need for $47 million in new recharge wells

Phased Supply Plan

- Nine diversion wells would be built for $11.7 million
- Ten existing recharge wells would be rehabilitated for $11.3 million to provide additional injection reliability
- An additional 14 recharge wells would be constructed if operational credits are not granted

1% Drought Starting in 2060



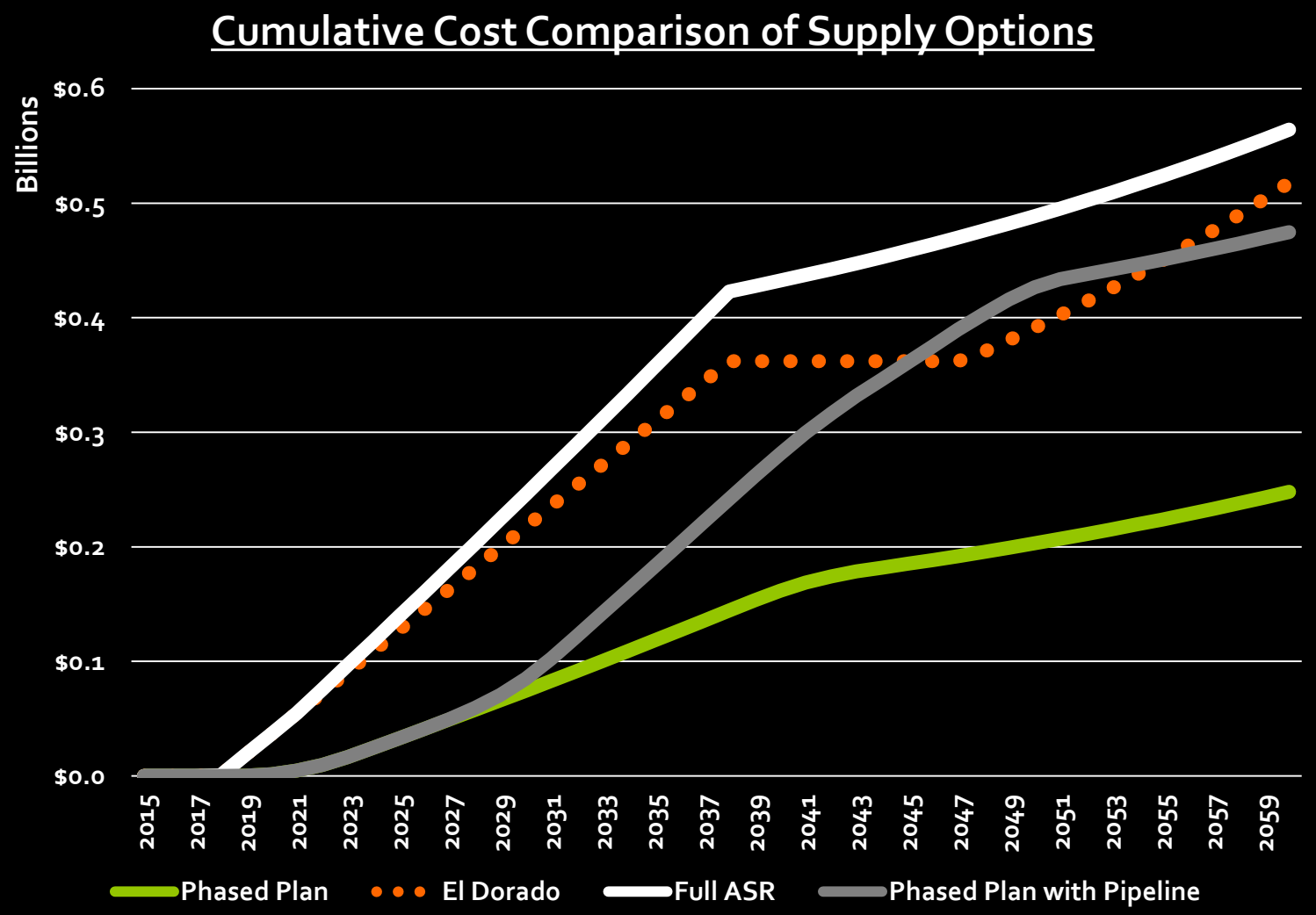
Summary of Phases

- First phases currently underway and focus on no-cost strategies
- Additional components aimed at minimizing chances of harsh water restrictions
- Phased plan constructs improvements when needed and avoids rate volatility

Phase	Title	Date	Capital Cost
1	Optimization	2016	-----
2	Elevation Adjustment	2016	-----
3	Operational Credits	2018	-----
4	Diversion Wells	2020	$11.7 million
5	Rehabilitate Existing Recharge Wells	2020	$11.3 million
6	Construct New Recharge Wells	2022	$47.2 million

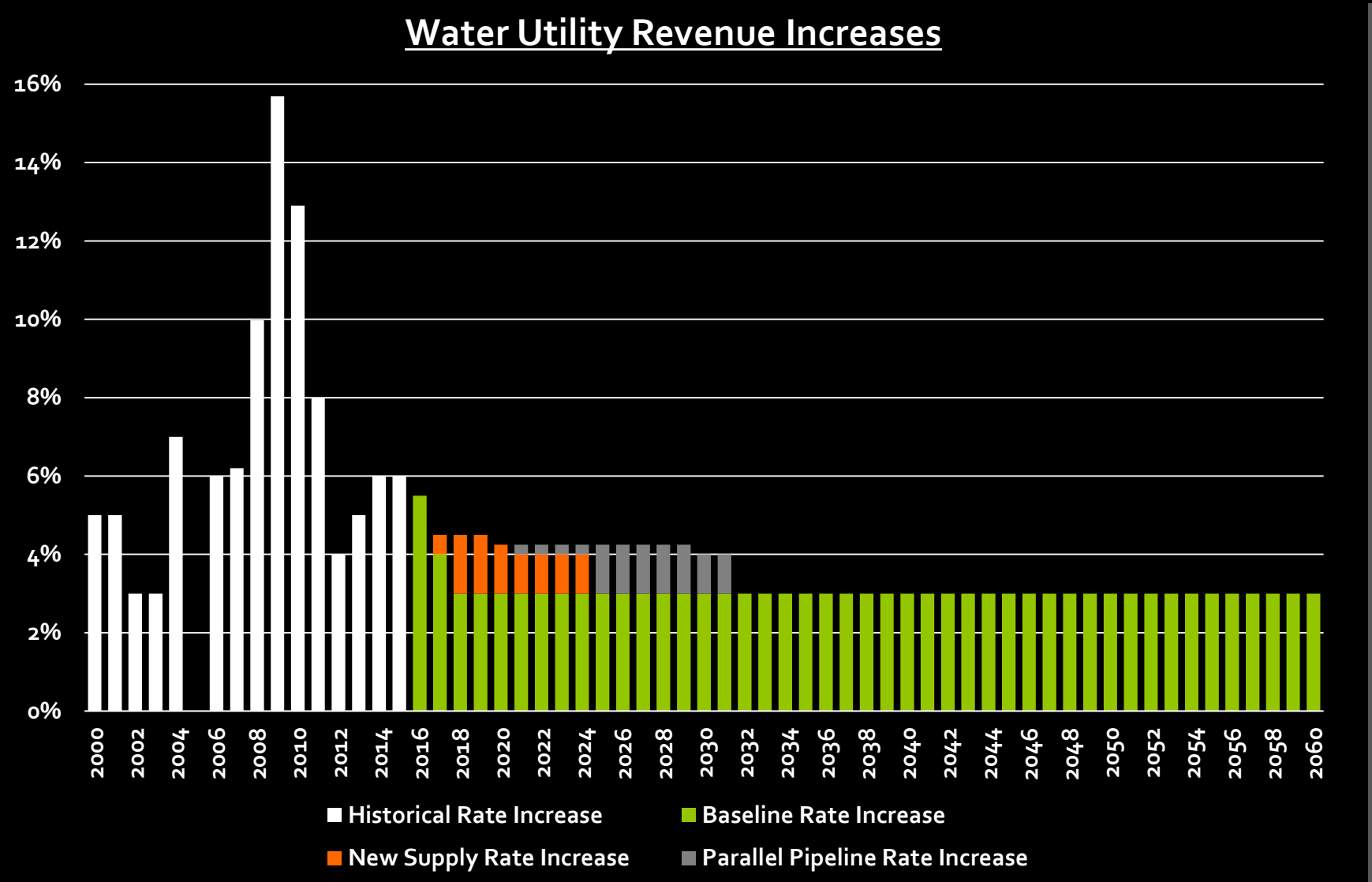
Cost Comparison

- Both the Full ASR and El Dorado plans assume that revenue bonds would be issued to substitute for the 2014 proposed sales tax
- Phased plan is much lower cost through 2060 than the Full ASR plan
- El Dorado Lake cannot provide the same amount of water as other options



Impact to Rates

- Current goal is to level annual rate increases to 3% annually in 2018 and beyond
- Higher increases would be needed through 2024 to build up financial capacity to issue revenue bonds
- Current projections show estimated water rate increases at or below 4.5%



Impact to Customers

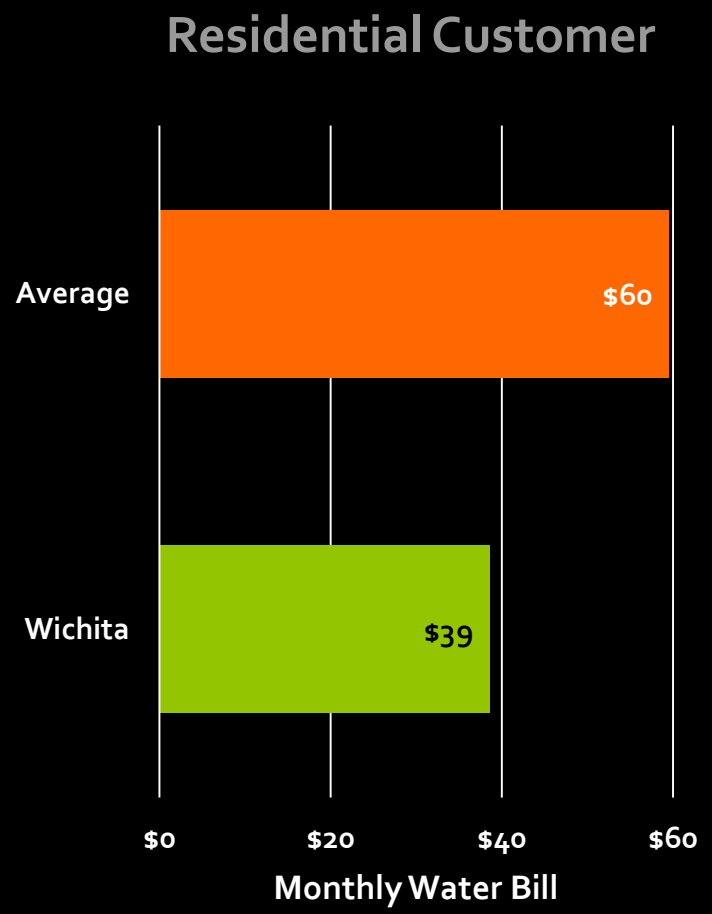
- Financial model assumes across-the-board water rate increases
- Once the final water supply component is built in 2022, customers would be paying 9% more than if a new water supply was not built
- The percentage difference is for water only, not sewer

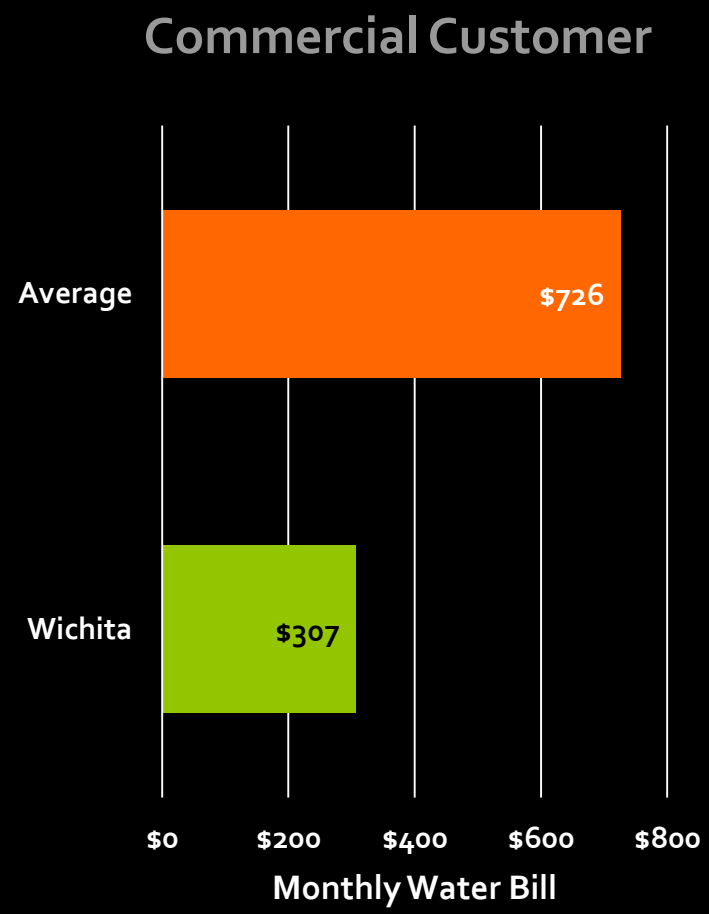
Monthly Water Bills

Year of Final Water Supply Rate Increase				2024
	Baseline in 2024	New Supply in 2024	Difference in $	Perc. Difference
Residential Customers				
3,750 Gallons	$25.79	$28.06	**$2.27**	**9%**
7,500 Gallons	$35.46	$38.58	**$3.12**	**9%**
15,000 Gallons	$98.23	$106.89	**$8.66**	**9%**
Commercial Customers				
100,000 Gallons	$281.84	$306.67	**$24.83**	**9%**
Industrial Customers				
10 Million Gallons	$25,905	$28,187	**$2,282**	**9%**

Impact to Customers

- Projection shows how Wichita will compare to 50 largest cities in 2024, when final new supply increase would go into effect
- Based on average water bills in the 2013 Black & Veatch survey of the 50 largest cities
- National average rate increase from 2001-2013 was 5.6% annually



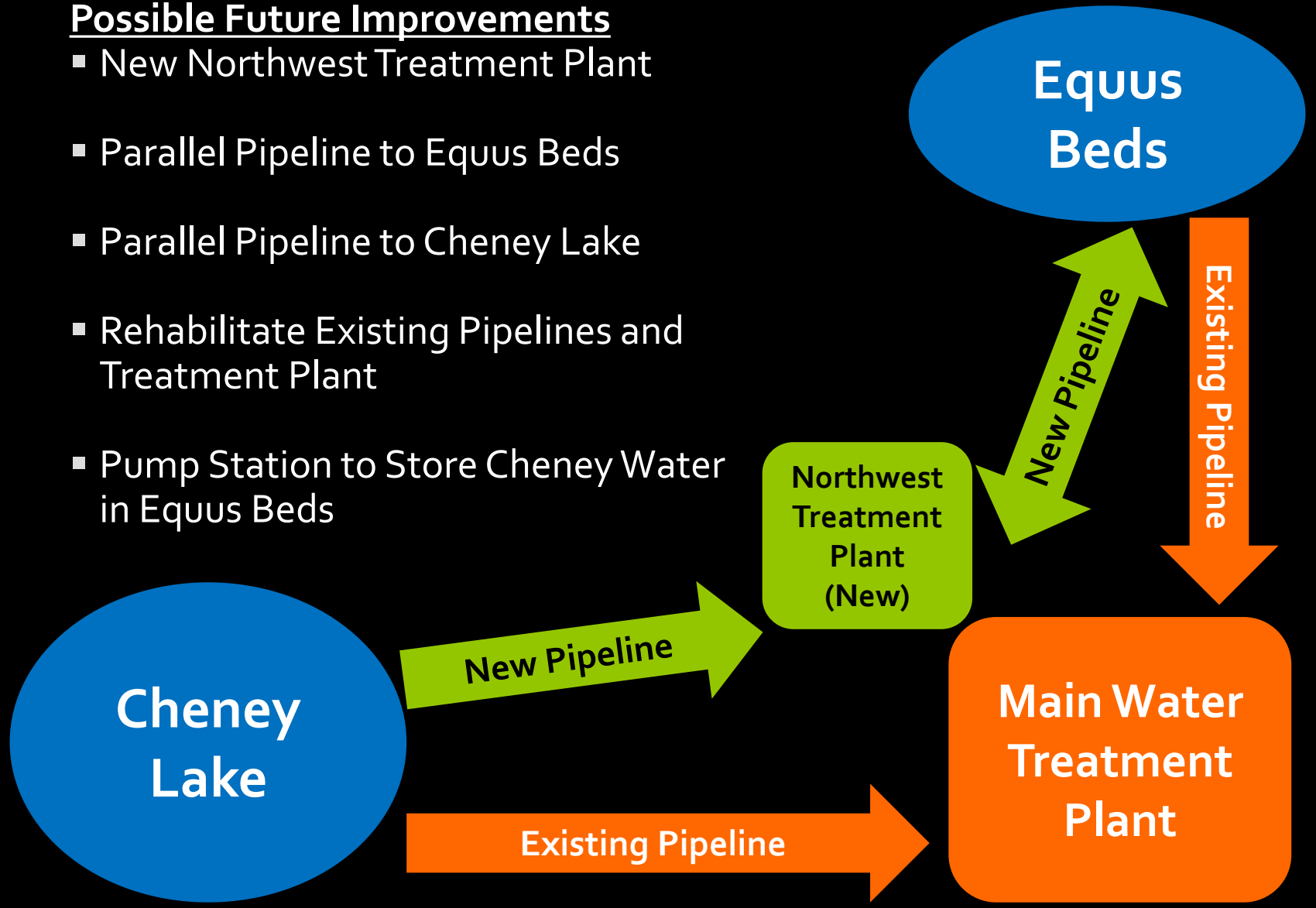


Future Water Plans

- Current phased plan is aimed at addressing drought supply needs
- Additional considerations will inform a long-term water master plan
- Future improvements could be targeted to make the existing system more reliable and provide redundant infrastructure

Possible Future Improvements

- New Northwest Treatment Plant
- Parallel Pipeline to Equus Beds
- Parallel Pipeline to Cheney Lake
- Rehabilitate Existing Pipelines and Treatment Plant
- Pump Station to Store Cheney Water in Equus Beds



Questions