CENTRAL IOWA WATER WORKS

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AGENDA

Board of Trustees Workshop
Central Iowa Water Works
November 20, 2024
Mid-American Energy Rec Plex, Community Room A
2:00 p.m.

Please join our meeting from your computer, tablet or smartphone.

Join Zoom Meeting
Meeting ID: 858 4961 8705
Passcode: 378085
United States:
+1 (646) 931-3860

Item 1: Call to Order

Item 2: Roll Call

Item 3: Presentation of CIWW Future Production Study Report by HDR

Item 4: Board Discussion of Study

No official action will take place during the Workshop.

Adjournment

CENTRAL IOWA WATER WORKS

REGIONAL WATER TREATMENT FACILITY STUDY

November 2024

Introduction

The Des Moines Metropolitan Area is a thriving metropolis that is emerging as a premier city for businesses, entrepreneurs, young professionals, and families. A safe and reliable water supply has always been and will continue to be central to the areas's viability, economy, and quality of life. Drinking water for the metro area has historically been provided largely by the Des Moines Water Works (DMWW) supplemented by West Des Moines (WDMWW), Grimes, and Polk City.

In order to successfully support the Des Moines area growth and prosperity, **Central Iowa Water Works (CIWW)** was established to provide regional governance of drinking water production, as well as continue to maintain and improve vital water infrastructure and services, while retaining a mindset for sustainable and responsible management of public resources.

CIWW initiated this project to determine the way forward for planning, design, and construction of new water supply, treatment and distribution facilities for the growing metropolitan area. This project incorporates the efforts from previous studies, which presented alternatives to meet the long-term needs and improve system reliability through a somewhat independent lense, including:

- DMWW 2017 Long Range Plan and 2021 Update
- 2021 Saylorville Water Treatment Plant Expansion Preliminary Engineering Report
- 2013 Urbandale Water Utility PER, 2021 City of Grimes Water Utility Evaluation and Management Plan
- 2021 WDMWW A.C. Ward WTP Evaluation Report
- 2020 West Water Production Facility Process Evaluation for WDMWW and Cities of Waukee and Van Meter

The goal of this project is to build upon this work to strategically determine: *Where does CIWW want to go?*

CIWW Member Agencies

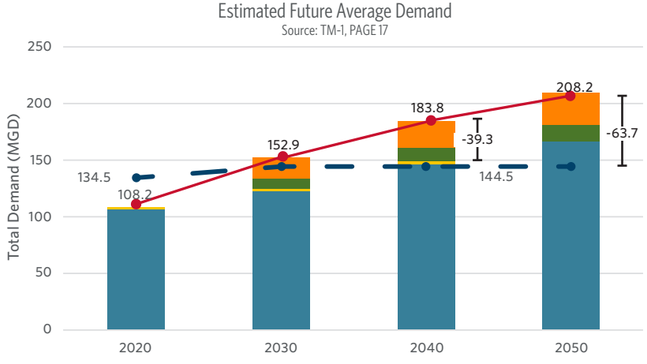
- Ankeny
- Clive
- Des Moines Water Works
- Grimes
- Johnston
- Norwalk
- Polk City
- Urbandale Water Utility
- Warren Water District
- Waukee
- West Des Moines Water Works
- Xenia Rural Water District

Demand Projections

One of the first steps in helping to determine the direction CIWW should go was to establish Population and Demand Projections. The Des Moines metropolitan area is growing rapidly, with a population exceeding 600,000 as of the 2020 census. Using a variety of sources, including the Metropolitan Planning Organization (MPO) future population projections, the overall population growth was estimated which indicates approximately 679,000 people by 2030 and nearly 900,000 people by 2050.

Using these population estimates, coupled with the average daily demand for each community, the future years average demand for water was estimated. The overall peak day demand by year was then determined using the historical ratio of average day to peak day demand (the demand which the system must supply). Aquifer Storage and Recovery (ASR) wells have been used throughout the metropolitan area to store water underground (often in the winter when demand is lower) and recover it when needed (hot summer days). ASR wells allow the CIWW area to "shave off" the peak day demand. Subtracting the ASR well capacity from the peak day demand resulted in the peak day demand shown in the graph to the right in blue bars. In addition to calculated demand, CIWW members included appropriate industrial reserve capacity (green bars), and a 15% buffer capacity (orange bars). Lastly, any contracted amounts to non-CIWW members were also included, resulting in the **total demand projection which reaches over 208 million gallons per day (MGD) by 2050 resulting in a treatment and supply deficit of approximately 64 MGD.**

Estimated Future Average Demand
Source: TM-1, PAGE 17



Supply, Treatment, Transmission and Distribution Evaluations

Supply: Upon completion of the demand projections, each of the previous studies' supply and treatment alternatives were summarized and evaluated. Water supply for the Des Moines Metropolitan Area comes from the Raccoon and Des Moines rivers. Flow and potential yield was evaluated for each river. While both rivers have additional capacity to meet the growing need, the Des Moines river has greater capacity to supply the water demand needs. Both sources are susceptible to undesirable water quality characteristics, including high nitrate. It should also be noted that neither river is 100% reliable to meet the projected maximum day water demand under drought conditions. Source water, storage facilities, as well as drought management plans, will be required regardless of treatment scenario.

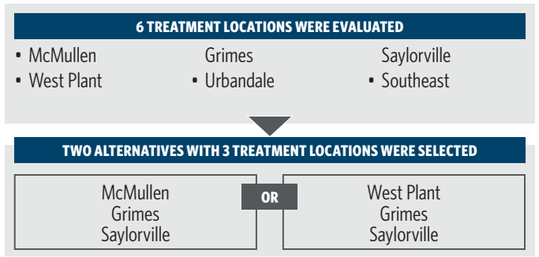
Treatment: Future water treatment locations that were evaluted to meet the growing demand included:

- Expansion at DMWW's McMullen (12.5 additional MGD) and construction of a larger new Saylorville (25 to 50 MGD) treatment plant (Saylorville II/III).
- Expansion of Grimes treatment plant (additional 3.3 MGD).
- A new water treatment plant (12 MGD) planned by WDMWW near Van Meter (West Plant).
- A new water treatment plant (up to 20 MGD) planned by Urbandale near Merle Hay Road and Interstate 35/80. *This location was eliminated due to limited available land.*
- Cursory review was given to siting a new treatment plant in the southeast metropolitan area downstream of the confluence of the Des Moines and Raccoon rivers, downstream of the Water Reclamation Authority (WRA) discharge. *This location was eliminated due to its potential impact on the WRA, in addition to being essentially an Indirect Potable Reuse facility for which Iowa DNR has very limited precedent in state to base its regulatory requirements upon.*

To meet the future demand, two alternatives were developed as shown below based on the remaining water treatment plant locations.

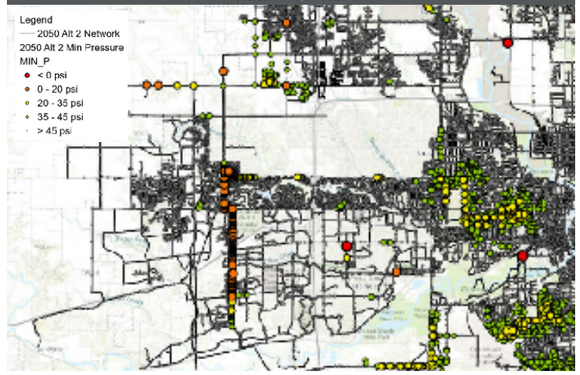
- **Alternative 1: Expansions at Grimes and McMullen, and construction of Saylorville II/III plant.**
- **Alternative 2: Expansion at Grimes, and construction of Saylorville II/III and the West Plant.**

Opinions of Probable Construction Cost (OPCC) were developed for each alternative by taking information from the previous studies and updating them with new information and cost construction factors that were similarly applied to each alternative.



Transmission and Distribution: A hydraulic model was developed that encompassed the entire CIWW service area to determine the impact of future demand on the transmission and distribution system. Based on the future demand and locations of the proposed treatment plants, transmission and distribution improvements were identified. Improvements were categorized as either common to both alternatives or associated with Alternative 1 or 2. OPCCs for each improvement were developed resulting in common costs, costs for Alternative 1 and costs for Alternative 2.

Example of Model Results for Alternative 2, Maximum Pressure
Source: TM-6, PAGE 53



Evaluation

After each alternative was developed, both were evaluated based on both monetary and non-monetary criteria.

Monetary. OPCCs for this project are considered Class 5 estimates with an expected accuracy of -35% to +60%. Costs include **source, water treatment, common transmission and distribution, and transmission and distribution projects specific to each alternative.** Timing for projects and resulting spending for each alternative would be spread out between now and 2050 based on projected demand.

- **Alternative 1 OPCC: $1.25B (2024 dollars)**
- **Alternative 2 OPCC: $1.30B (2024 dollars)**

Non-Monetary. Prior to completing the Supply, Treatment, Transmission and Distribution Evaluations, non-monetary criteria were established on which each alternative would be scored. These criteria included:

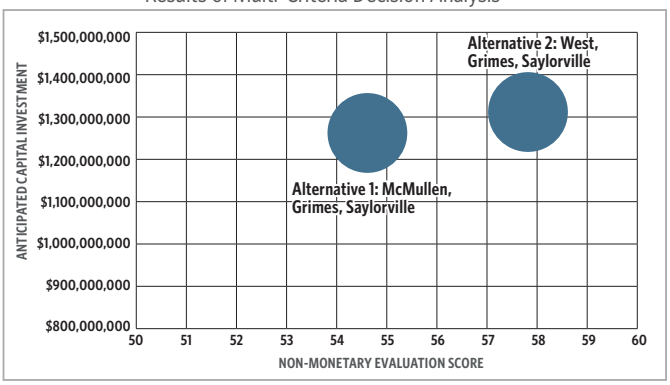
- End Use Resiliency
- Complexity of Conveyance (Transmission and Distribution) System Improvements
- Complexity of Treatment Improvements
- Ease of Operation and Maintenance
- Environmental Stewardship
- Ease of Implementation

Each criteria was given a specific definition and weighted by CIWW members. Alternatives were then evaluated against each criteria, resulting in a non-monetary evaluation score. Criteria weights and evaluations were refined in a workshop setting with CIWW members.

Selected Alternative

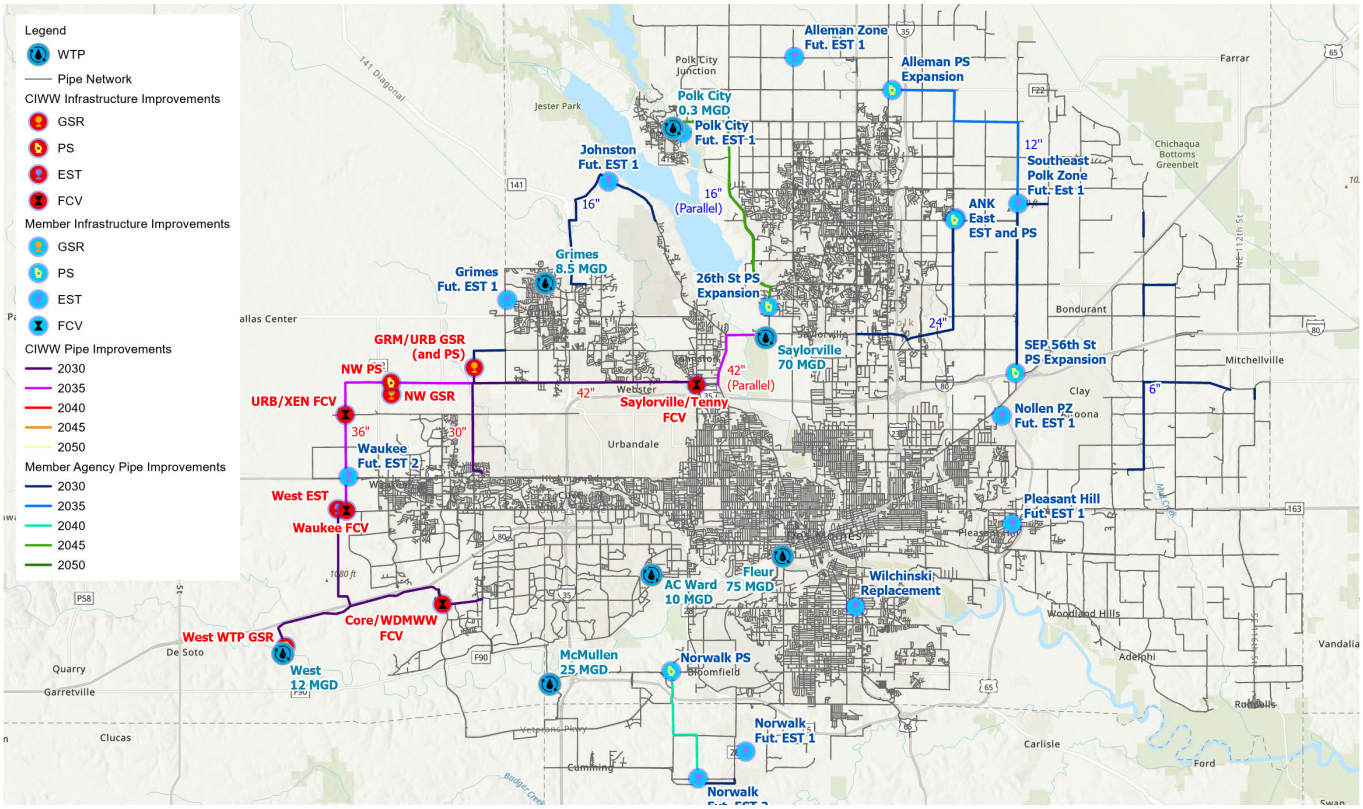
As a result of this analysis, Alternative 2 was recommended. Although Alternative 2 has a higher OPCC, the non-monetary score was higher. In addition, **Alternative 2 provides more robust treatment, specifically for nitrates (a regulated contaminant), resulting in higher finished water quality delivered to the metropolitan area at a similar cost.** The figure to the right graphically presents the results of the Multi-Criteria Decision Analysis (MCDA). The map below shows locations of needed improvements, both treatment and transmission/distribution.

Results of Multi-Criteria Decision Analysis



ALTERNATIVE 2: EXPANSION AT GRIMES, AND CONSTRUCTION OF SAYLORVILLE II AND THE WEST PLANT

SOURCE: TM-7, PAGE 22



Next Steps

CIWW has worked diligently through this process. From establishing the future demand, to evaluating the source water capacity, to development of alternatives to meet that capacity, a lot has been accomplished. Yet there is still much to do. This project established the strategic vision and started the down the road to master planning for this newly formed utility. **Moving forward, more detailed capital planning and establishment of timing triggers for project construction will need to be completed to refine the alternatives, evaluate potential cost savings, and ensure that safe, reliable, drinking water is provided to the Des Moines Metropolitan Area well into the future.**