Integrated Water Resource Plan
Summary Report

October 2024

Introduction

This Integrated Water Resource Plan (IWRP) Summary Report represents a compilation of evaluations and planning efforts focused on developing a 50-year outlook of water supply projects to serve the growing water needs of the Citizens Energy Group (Citizens) Water System serving Indianapolis and surrounding communities. The need for additional water supply, treatment, and distribution projects is based on peak-day water demand forecasts developed through an extensive evaluation of water usage trends, population projections, and economic development initiatives. The IWRP allows Citizens to determine the timeline for future water projects needed to meet the future demand projections. The IWRP is continually updated to ensure the latest data and information is used in the long-term plan. This report serves to provide a summary of these planning efforts.

IWRP Purpose & Use

The purpose of the IWRP is to provide a framework for Citizens to plan the appropriate supply, treatment, and distribution capacity improvement projects in a timely manner to meet the projected demand needs of its customers and communities for the next 50 years. This framework is used to prioritize near-term capital projects required to support the long-term plan. The IWRP is intended to be dynamic, allowing for projects to move forward or backward as information and projections change. By continuously reviewing this long-term plan, Citizens ensures projects are delivered when they are needed for the growing region of Central Indiana.

When new demand requests are made beyond what is included in the demand projections, Citizens assesses how the scheduled capacity improvement projects would need to be accelerated to meet the proposed new demand in addition to the current projected demands. Citizens then considers what additional capacity improvement projects would be required to meet the increased 50-yr demand projection to determine if the new, proposed demand can be accommodated.

Citizens Water System Background

The Citizens Water system includes a variety of assets to provide the source of supply, treatment and distribution of potable water to customers. Citizens owns and operates Morse Reservoir, Geist Reservoir, Citizens Reservoir, and numerous well fields. In addition, Citizens withdraws water supplies from Eagle Creek Reservoir, owned by the City of Indianapolis, and from the White River and Fall Creek. Approximately 75% of the water supply is provided by surface water sources with the remaining 25% supply derived from ground water withdrawn from the various wellfields.

Raw water from these sources is treated at one of four (4) surface water and six (6) ground water treatment plants. The system contains 34 finished water storage tanks capable of storing a total of 84 million gallons (MG). Finished water is distributed through over 4,550 miles of water mains to approximately 350,000 retail customers and eight (8) wholesale customers within Central Indiana.

Maximum Day Demand and Demand Projections

A critical planning goal for water systems is the maximum day demand. Water system infrastructure must be designed to maintain system pressure under projected maximum day demand conditions in order to ensure that water quality and firefighting capability is not compromised. The maximum day demand can increase or decrease in any given year based on the particular annual weather pattern, with lower maximum day demands during wet years and higher maximum day demands during drought years. Citizens has established a planning goal based on supplying the projected maximum day demand that would occur under moderate drought conditions in any given year. More severe drought conditions would require demand management practices to be implemented, such as implementation of water conservation ordinances limiting outdoor water use. Citizens Water experienced its record peak-day demand of 231 MG during the drought of 2012.

Maximum day water demand projections are made biennially by Citizens based on the latest Indianapolis Metropolitan Planning Organizations population projections and recent trends in customer water use, including conservation trends. The current 50-year demand projection encompasses water demands for Citizens existing water service territory, current wholesale customers, and the expected wholesale supply to Lebanon of 25 MGD. Despite ongoing conservation projected per customer, the future demand forecast is increasing due to projected population growth. In addition to the maximum day demand projection, a demand planning goal is calculated, adding a 10% buffer to the maximum day demand forecasts. These two projections provide a target window for system capacity, and each of these projections is shown for the 50-yr planning window in Figure 1.

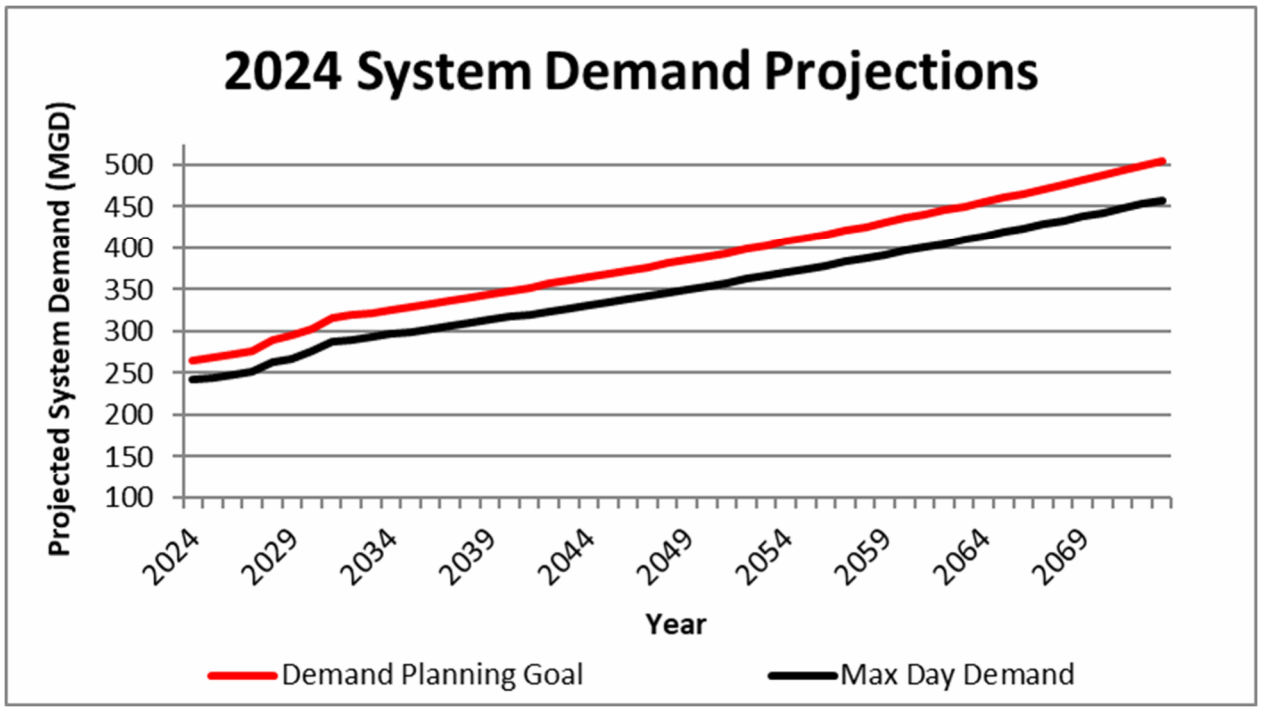

Figure 1: 2024 Maximum Day Demand projection through 2073. The Demand Planning Goal includes a 10% buffer target.

IWRP Capacity & Yield Assessment

The IWRP documents the available source water during moderate drought conditions, the available treatment capacity of each of the water treatment plants, and the capacity of the distribution system conveying the finished water from the water treatment plants. The IWRP evaluates these by treatment plant to determine the current usable capacity for each under moderate drought conditions.

Available Source Water Capacity

The surface water and ground water available to each of the water treatment plants is determined by utilizing a surface water yield model and historical well yields.

Citizens uses a surface water yield model that utilizes over 80 years of historical rainfall and streamflow data, projected customer demands, and downstream minimum flow targets to determine the available maximum day supply yield. Citizens uses streamflow conditions during the drought of 1988 as a surrogate to determine available surface water yield. The yield model is updated periodically to capture changes such as new reservoir bathymetric data, new reservoirs, new intakes, or increased upstream NPDES discharges.

The available ground water yield is determined from historical production rates for each of the well fields. The production rates are reviewed to determine the reliable yield that can be anticipated during a moderate drought for each well field. The net well field yield during the previous summer period is evaluated and adjusted downward to adjust for moderate drought conditions to obtain a projected ground water yield.

The current maximum day supply yield available at Citizens existing withdrawal points is documented in Table A.

Asset Capacities

The IWRP also considers the reliable capacity of each treatment facility and corresponding pumping systems conveying the finished water. This information is reviewed annually to document operational changes or capital improvements made to each of the facilities and the surrounding infrastructure. The reliable capacity is determined by reviewing the recent historical performance of each facility and each facility's processes.

The capacity of the distribution system conveying finished water from the plant is validated using Citizens' hydraulic model. This includes the maximum capacity that can be conveyed through the existing infrastructure surrounding the plant.

A summary of the available moderate drought capacity at each of the water treatment plants for the current year is provided in Table A.

Table A: 2024 IWRP source, treatment, and distribution capacity table by water treatment plant

Treatment plant	Moderate Drought Yield			Asset Capacities				Moderate Drought Usable Capacity
	Surface Water Capacity	Ground Water Capacity	Total Raw Water Capacity	Surface Water Treatment Capacity	Ground Water Treatment Capacity	Pumping / Distribution System Limitations	Asset Capacity	
White River	109.7	9.5	119.2	120.0		150.0	120.0	119.2
White River North	59.0	10.8	69.8	34.0	10.0	46.0	44.0	44.0
Fall Creek	34.3	6.6	40.9	39.6		46.0	39.6	39.6
TW Moses	26.8	0.0	26.8	22.8		26.0	22.8	22.8
Harding		3.2	3.2		4.8	7.5	4.8	3.2
South Well Field/Waverly		17.4	17.4		22.0	33.0	22.0	17.4
Geist GWTP		7.5	7.5		7.0	14.0	7.0	7.0
Ford		1.1	1.1		1.3	3.8	1.3	1.1
Harbour		3.6	3.6		5.4	4.0	4.0	3.6
Purchased Water		1.3	1.3		1.0	1.6	1.0	1.0
Total	**229.8**	**61.0**	**290.8**	**216.4**	**51.5**	**331.9**	**266.5**	**258.9**

50-Yr Demand and Capacity Outlook

The moderate drought usable capacity shown in Table A is the current baseline for the Citizens Water system. The demand projections shown in Figure 1 provide the projected maximum day demand if a moderate drought were to occur. Comparing the moderate drought usable capacity to the demand projections provides the required amount of capacity improvement projects to increase the source water, treatment, and/or distribution capacity of the system in order to meet current and future customer demands.

To ensure the moderate drought usable capacity is sufficient to meet future demands, Citizens identifies a wide variety of potential capacity improvement projects, determines the viability of each potential project, and estimates the costs for each project. The projects are then ranked based on their cost-benefit value and assigned future completion years to meet the projected future system demands. The resulting planned projects for the next 50 years are shown below in Figure 2 and is the primary output of the IWRP process.

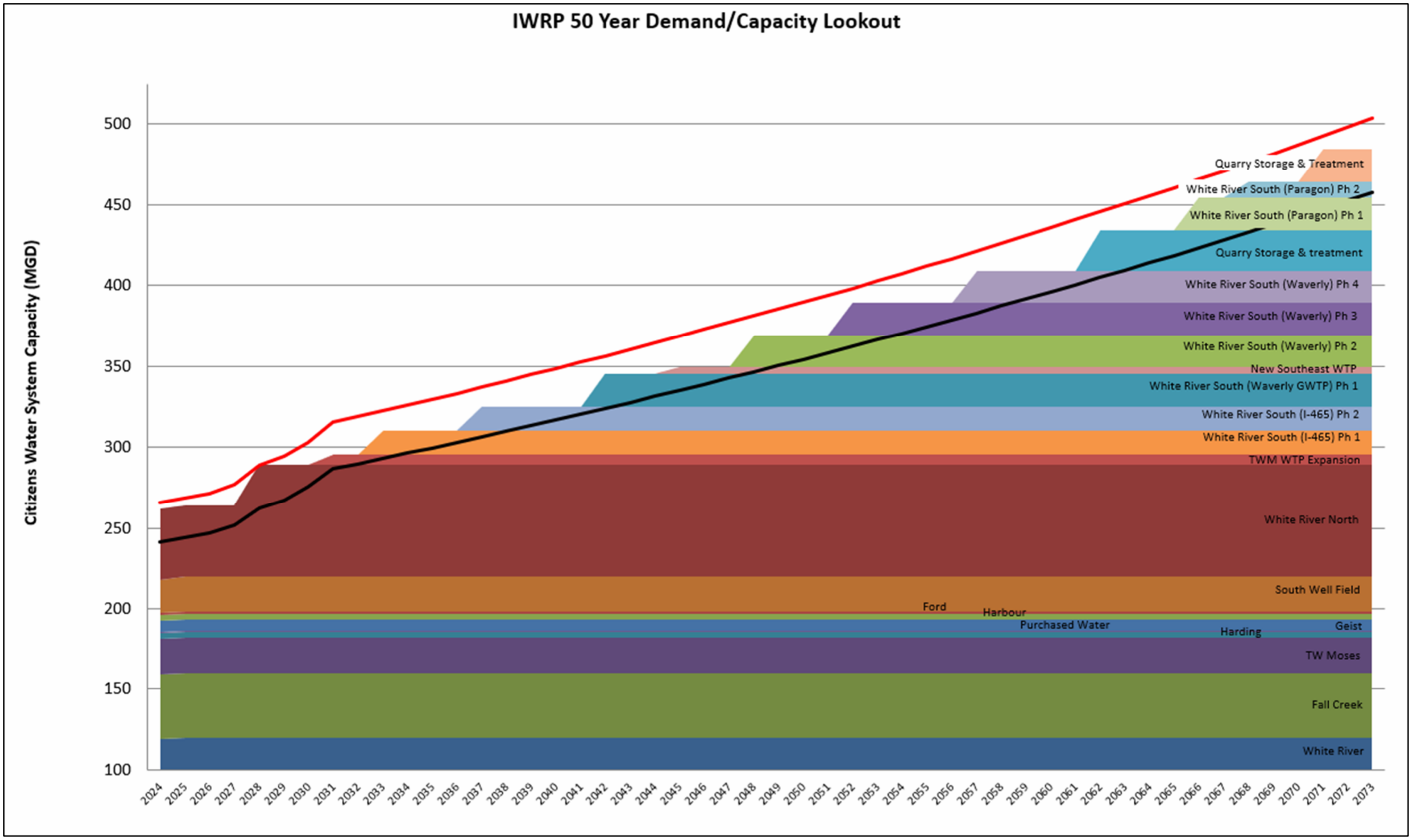

Figure 2: 2024 IWRP 50-year demand and capacity outlook graph

Completed Capacity Improvement Projects

Citizens acquired the water utility in August of 2011 from the City of Indianapolis, and at that time the system had a supply deficit of 31 MGD between the moderate drought usable capacity of 213 MGD and the demand planning goal of 244 MGD. In the years from 2011 to 2024, Citizens has completed numerous projects to close the gap between the demand projections and the available usable capacity of the treatment plants. Below is a table of projects completed by Citizens from 2011 to 2024 to add or maintain capacity. As of 2024, the Citizens water system has a usable capacity of 259 MGD, a forecasted maximum day demand of 244 MGD, and a demand planning goal of 266 MGD. This currently gives Citizens a surplus of 15 MGD from the forecasted maximum day demand and a deficit of 7 MGD from the demand planning goal.

Table B: Citizens Capacity Improvement Projects Completed 2011 to 2024

Project Name	Year	Source (MGD)	Treatment (MGD)
White River North Intake Screens	2013	2	0
CSM Interconnect	2013	1	1
Geist Well Replacement (1a, 2a, 3a, 5a)	2014	2	0
Harbour WTP	2015	4	3
Fall Creek VOC Removal	2017	4	0
White River to Canal Intake	2018	10	0
Fall Creek to Canal Intake (Aqueduct)	2018	20	0
New Waverly Well	2019	2	0
New Harbour Wells	2019	1	0
White River #3 Air Stripper	2020	2	0
Aqueduct Intake Expansion	2020	20	0
Riverside Rock Well #30	2021	2	0
Citizens Reservoir	2021	20	0
Riverside #E	2022	1	0
SR 32 Wellfield	2022	4	0
WRN Well #8	2022	1	0
Geist Well #4 Replacement	2023	1	0
SWF Wells (7a, 12a, 20)	2024	4	0
Total		**101**	**4**