# CONSULTING ENGINEER'S ANNUAL REPORT - WATER SYSTEM

CAPITAL REGION WATER
HARRISBURG, PA

**September 2023**
GANNETT FLEMING PROJECT NO.: 064841.CEAR.2023


Prepared for:
Capital Region Water

GANNETT FLEMING

## TABLES



## FIGURES

# 1.0 INTRODUCTION

Gannett Fleming, Inc. prepared this Water System Consulting Engineer's Annual Report (CEAR) for Capital Region Water (CRW) as required by the Trust Indenture between CRW and the Bank of New York Mellon Trust Company, N.A. originally dated January 1, 1991, and Amended and Restated as of April 1, 2014, and May 1, 2018. This CEAR is being submitted to comply with the following requirements, as outlined in the Indenture:

Section 7.11:

> *"It shall be the duty of the Consulting Engineers, in addition to the other duties prescribed elsewhere in this Indenture, to prepare and file with the Authority and with the Trustee on or before 90 days prior to the beginning of each Fiscal Year hereafter, a report setting forth the following:*
>
> *a. Their advice and recommendations as to the proper maintenance and repair of the operating and water delivery infrastructure of the Water System during the next Fiscal Year;*
>
> *b. Their advice and recommendations as to the Capital Additions that should be made during the next Fiscal Year and their estimate of the amounts of money necessary for such purpose; and*
>
> *c. Their finding whether the operating and water delivery infrastructure of the Water System have been maintained in good repair and sound operating condition and their estimate of the amount, if any, required to place such operating and water delivery infrastructure in such condition and the details of such expenditures and the approximate time required therefor."*

CRW's fiscal year runs from January 1 through December 31 of each year. The Water System includes the Dr. Robert E. Young Water Services Center Water Treatment Facility, Susquehanna River Raw Water Intake, the DeHart Dam Reservoir, finished water reservoirs (Upper Reservoir, Lower Reservoirs 1 & 2), pump stations, pumping equipment, transmission and distribution mains, and related equipment servicing the City of Harrisburg (City) and portions of the Borough of Penbrook, Swatara Township, Susquehanna Township, and Lower Paxton Township, all located in Dauphin County, Pennsylvania.

## 1.1 Report Methodology and Limitations

In preparing this CEAR, existing records and documents prepared by or on behalf of CRW were reviewed to understand, assess, and report on the technical information contained therein as it relates to the FY 2022 CEAR. The major relevant documents provided by CRW and reviewed as part of the CEAR include, but are not necessarily limited to, the following:

- 2022 Water Allocation Permit Compliance Report
- 2022 Drinking Water Quality Report
- 2022 DeHart Dam Annual Safety Inspection Report
- 2022 Water Loss Audit for Finished Water
- 2022 and 2023 Drinking Water Division Monthly Reports

- Historic Actual Water System Expenses (FY 2021 and FY 2022)
- Budgeted FY 2023 Water System Expenses
- Asset Management Plan
- 2024 Capital Improvement Plan

In addition, limited visual site inspections of the following components of the Water System were conducted on July 28, 2023:

- DeHart Dam, Reservoir Control Building, and Chemical Feed Facility
- Susquehanna River Raw Water Pump Station
- Dr. Robert E. Young Water Services Center Treatment Facility
- Gate House Pump Station
- Union Square Industrial Park Booster Station
- Lower Finished Water Reservoirs 1 & 2

The review also included discussions with representatives of CRW and performance comparisons to other comparable water systems and related industries.

This CEAR summarizes the findings of the visual inspections at the time they were conducted, and the findings of the data reviewed and discussions with CRW up to the date of the issuance of the CEAR. Changed conditions occurring or becoming known after such date could affect the material presented and the conclusions reached herein to the extent of such changes.

Gannett Fleming has not independently verified the accuracy of the information provided by CRW and others. However, we believe such sources are reliable and the information obtained to be appropriate for the analysis undertaken and the conclusions reached herein. In addition, the scope of our review did not include any pending or threatened litigation against CRW. CRW has stated that there is no pending litigation related to its water operations.

In completing this CEAR for CRW, Gannett Fleming is not serving in the role of a "municipal advisor" under the regulations of the Securities and Exchange Commission. As such, Gannett Fleming is not recommending any action regarding municipal financial products or the issuance of municipal securities and is not acting as a registered municipal advisor to CRW, and does not owe a fiduciary duty to CRW pursuant to Section 15B of the Securities Exchange Act of 1934, as amended by the Dodd-Frank Wall Street Reform and Consumer Protection Act, with respect to the information and material prepared in connection with this CEAR. CRW should discuss any information and material prepared in connection with this CEAR with any and all internal and external financial and other advisors that they may deem appropriate before acting on this information and material.

# 2.0 WATER SYSTEM MANAGEMENT

## 2.1 Overview of the Water System

The primary source of drinking water for the Water System is the William T. DeHart Dam and Reservoir located 20 miles northeast of the City in the Clarks Valley Watershed. The Dam and Reservoir collect water from a 22-square-mile watershed. The Susquehanna River provides CRW with a backup water supply and currently is only used in case of severe drought, emergency, or routine short-term operational exercise. The Susquehanna River had been used as a primary water source up until the construction of the DeHart Dam in 1940.

Components of the Water System were first established in 1839 when the Commonwealth of Pennsylvania granted the City permission to withdraw water from the Susquehanna River to serve City residents in the central part of the City. Over the years, numerous upgrades and expansions were undertaken to meet new regulations and to expand services City-wide and to other municipalities located in Dauphin County.

As was noted in the 2022 Drinking Water Quality Report and 2022 Water Allocation Permit Compliance Report, the Water System includes almost 220 miles of water mains ranging in size from 6-inches to 42-inches in diameter, approximately 1,800 fire hydrants, approximately 5,370 main valves, and approximately 19,900 service valves. The sources of supply, pumping, and treatment facilities are summarized in **Table 2-1**.

**Table 2-1: Summary of Supply, Pumping, and Treatment Facilities**

| Facility | Item | Capacity |
|---|---|---|
| DeHart Dam and Reservoir | Full Storage Capacity<br>Reservoir Yield<br>Allocation | 6.0 billion gallons<br>10.5 MGD<br>13.5 MGD |
| Susquehanna River Intake | Source Allocation<br>Pumping Capacity | 13 MGD (Secondary)<br>30 MGD |
| Dr. Robert E. Young Water Services Center Treatment Facility | Design Flow | 20 MGD |
| Upper Reservoir | Storage Capacity | 28 MGD |
| Lower Reservoir #1 | Storage Capacity | 6.0 MGD |
| Lower Reservoir #2 | Storage Capacity | 6.0 MGD |
| Susquehanna River Pump Station | Pumping Capacity | 14,000 GPM (with one pump out of service) |
| Gate House Pump Station | Pumping Capacity | 8,000 GPM (with one pump out of service) |
| Union Square Industrial Park Booster Station | Pumping Capacity at:<br>-Triplex Constant Pressure<br>-Fire Pump | <br>750 GPM<br>1,000 GPM |

## 2.2 Management and Staffing

CRW is governed by a five-member Board of Directors. A management team headed by the Chief Executive Officer is responsible for the technical and administrative operations of CRW, as well as the implementation of programs, policies, and procedures, and the execution of contracts upon approval by the Board. In addition to providing drinking water services, CRW also provides wastewater services. CRW operates as one entity; however, CRW separately tracks and records the provision of services associated with each of the utilities that it manages and operates.

CRW's organizational chart is made up of seven departments as well as an Executive Team. The seven departments are as follows: Finance, Engineering, Operations, Shared Services, Strategic Initiatives, Human Resources, and Risk and Safety. An overview of the current organizational structure of CRW is shown in Figure 2-1.

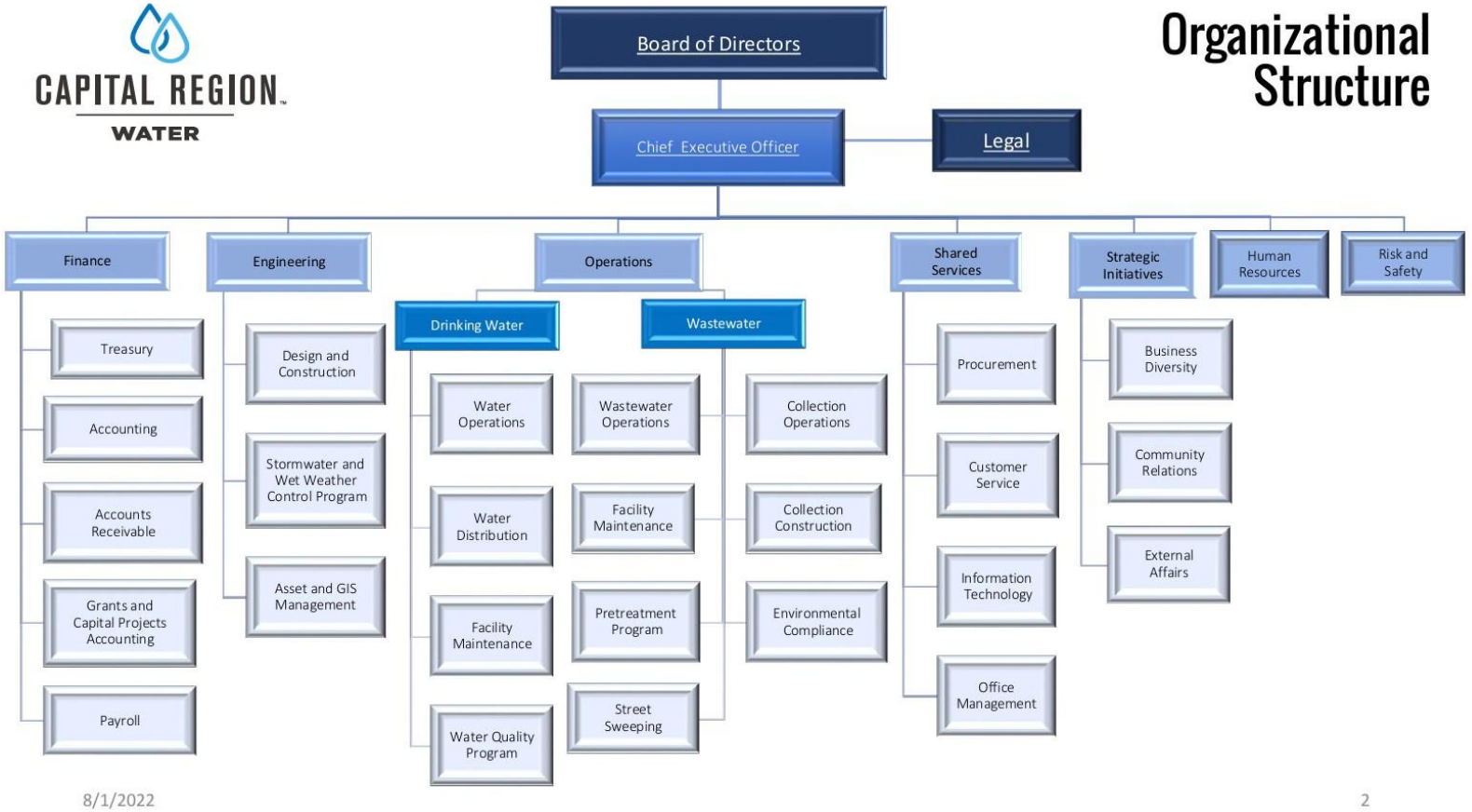


**Figure 2-1: CRW Management Level Organizational Chart**

### 2.2.1 Organizational Structure Description

The Drinking Water and Wastewater Departments are responsible for the operation and maintenance (O&M) of facilities, permit compliance, tracking and reporting, energy management, monitoring, long-term planning, repair and construction, and assistance in budget preparation and tracking. The Drinking Water Department includes plans for 38 positions, with 36 positions filled as of July 2023. The Drinking Water organizational chart is provided in **Figure 2-2**.

The Shared Services Department provides office management, information technology, customer service, and procurement services. The Engineering Department provides engineering support, project coordination, GIS coordination, wet weather coordination, and asset management services. The services currently provided by the Finance Department include accounting, billing and collections, customer service, and payroll. The Executive Team provides legal services. Human Resources was previously part of the Executive Team but is now a separate department reporting to the Executive Team. A Risk and Safety department was created by moving it out from under the Human Resources department. A Strategic Initiatives Department provides diversity and inclusion as well as community relations and other external affairs.

It is understood that CRW plans to staff the Shared Services Department, Engineering Department, Finance Department, Strategic Initiatives, Human Resources, Risk and Safety, and Executive Team with a total of 48 positions (18 for Shared Services, 10 for Engineering, 9 for Finance, 5 for Strategic Initiatives, 3 for Human Resources, 1 for Risk and Safety, and 2 for Executive), and as of July 2023, 46 of the 48 positions have been filled. Personnel expenses associated with these departments are allocated to each of the utilities based on budgeted time allocated to each of the services.

In summary, CRW's FY 2023 Drinking Water System budget includes estimated costs associated with the current and planned employees dedicated to the Drinking Water System and the Water System's share of costs associated with the planned positions under the Shared Services, Engineering, Strategic Initiatives, Finance Department, Human Resources, and Risk and Safety Departments as well as the Executive Team, which all provide support to CRW's water and wastewater utilities. These employees are all employees of CRW, with the majority belonging to a collective bargaining unit.

The organizational structure of CRW provides strong opportunities for economies of scale through the sharing of shared services, engineering, finance, and executive services between the water and wastewater utilities. The structure is generally consistent with similar-sized, combined utilities and it appears that all required Drinking Water System functions of CRW are adequately staffed and without excessive vacancies.

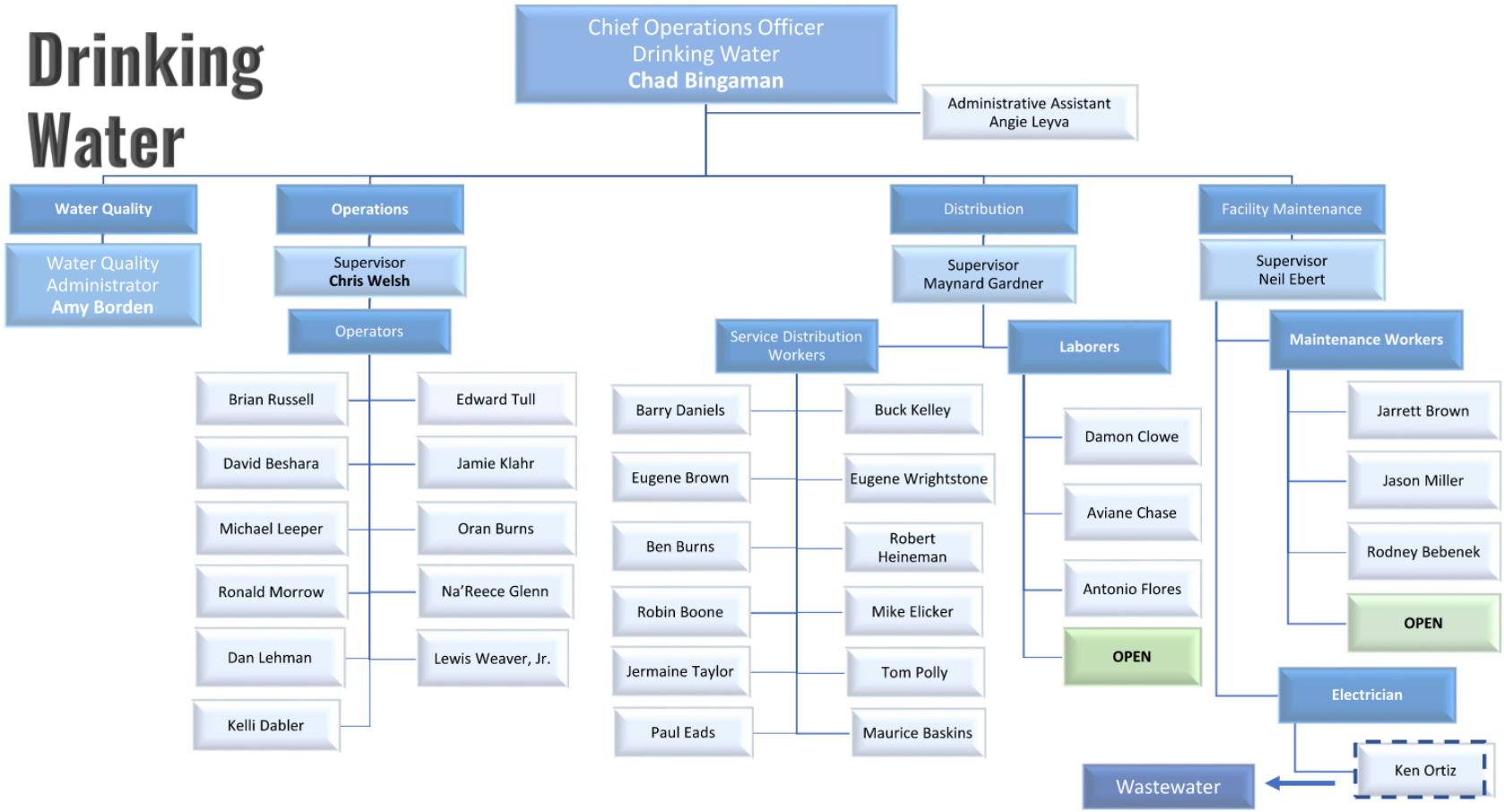


**Figure 2-2: Drinking Water Operations Division Organizational Chart**

# 3.0 WATER SYSTEM PERFORMANCE

## 3.1 Service Area

The service area of the Water System includes the City and portions of Penbrook Borough, Lower Paxton Township, Swatara Township, and Susquehanna Township. Except for some distribution system piping and related equipment, the majority of CRW's water assets are located within the municipal boundaries of the City. **Figure 3-1** below shows the water system infrastructure map.

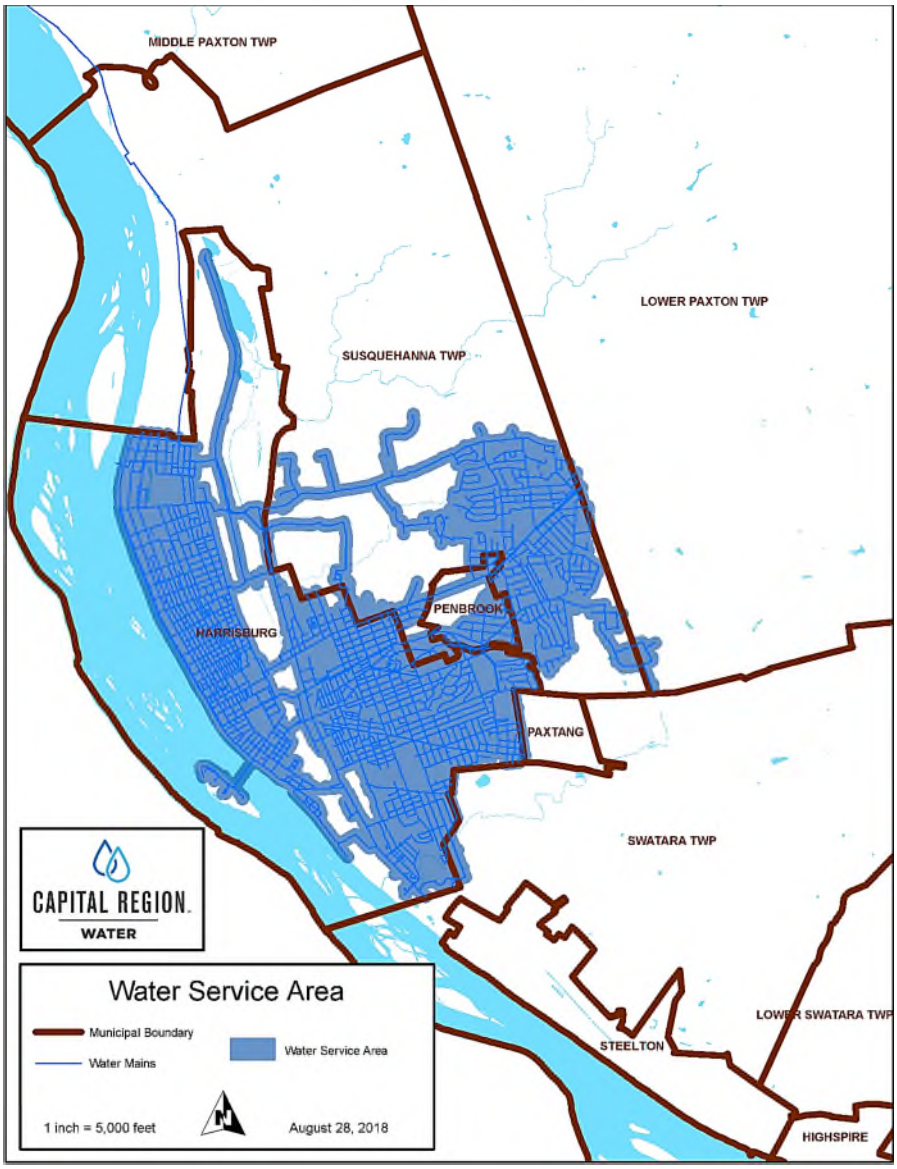


**Figure 3-1: Water System Infrastructure Map**

## 3.2 Customer Base

CRW maintains approximately 20,269 active meter connections within its service area, with the majority located within the City. The remainder are located in portions of Susquehanna Township, Swatara Township, and Penbrook Borough. CRW maintains only one domestic connection in Lower Paxton Township. The total estimated population served by the Water System is approximately 61,400.

A summary of the total number of connections and the total metered water consumption based on CRW records for fiscal year 2022 is shown in **Table 3-1**.

**Table 3-1: FY 2022 Customer Accounts and Metered Water Use**

| Water Customer Base Table | | |
|---|---|---|
| Description | Accounts | Consumption (1,000 gal) |
| **City of Harrisburg** | | |
| Residential | 14,849 | 770,490 |
| Commercial | 1,510 | 346,098 |
| Industrial | 23 | 264,693 |
| Public\Institutional | 192 | 182,322 |
| **Total** | **16,574** | **1,563,603** |
| | | |
| **Suburban Communties** | | |
| Residential | 3,405 | 177,820 |
| Commercial | 113 | 50,217 |
| Industrial | 1 | 41,365 |
| Public\Institutional | 14 | 6,833 |
| **Total** | **3,533** | **276,235** |
| **Total** | **20,107** | **1,839,838** |

Source: FY22 Customer and Billing Data provided by CRW

## 3.3 Water Supply and Demand

Pursuant to its Water Allocation Permit (Permit # WA-22-53B) issued by PADEP, CRW maintains a 13.5 million gallon per day (MGD) water supply allocation from the DeHart Dam and Reservoir and a 15.0 MGD secondary allocation from the Susquehanna River. However, the DeHart Dam has an estimated safe yield of 10.5 MGD. The design flow capacity of CRW's water treatment facility is 20.0 MGD. No changes to the water allocation permit or CRW's water treatment capacity are currently anticipated.

Average metered daily consumption was approximately 5.49 MGD in FY 2022 and peak day water production was 8.82 MGD in FY 2022. In addition, non-revenue water (NRW) has decreased from 31 percent in FY 2021 to 30 percent in FY 2022 and remains high at an average daily rate of approximately 2.24 MGD of the average daily finished water production. Although this represents a slight decrease from FY 2021, this NRW is an overall increase from historic levels due to changes required by PA DEP for longer filter backwashes. The 2021 Filter Plant Performance Evaluation says that one full filter volume should be purged via extended terminal subfluidization wash (ETSW) prior to filter to waste (FTW) being initiated. In order to return a filter to service, FTW is to be conducted for one full filter volume at normal production rate and

until effluent turbidity is <0.30 NTU prior to returning a filter to service. It should be noted that the Pennsylvania Public Utility Commission considers losses greater than 20.0 percent of total water production to be excessive. Regardless, it appears that CRW currently has sufficient access to raw water supplies and has the storage and treatment capacity to meet demand. A summary of the current water supply and demand statistics is shown in **Table 3-2**.

**Table 3-2: Water Supply and Demand**

| Description | Million Gallons Per Day | |
|---|---|---|
| Water Supply | FY 2021 | FY 2022 |
| Water Supply Yield<br>-Primary<br>-Secondary | 10.50<br>15.00 | 10.50<br>15.00 |
| Water Treatment Capacity | 20.00 | 20.00 |
| Water Demand | | |
| Average Metered Daily Consumption | 4.91 | 5.14 |
| Peak Day Water Production | 8.37 | 8.82 |
| Non-Revenue Water | 2.16 | 2.24 |
| Total Average Daily Water Production | 7.01 | 7.38 |
| Performance Ratios | | |
| Non-Revenue Water as a % of Water Production | 31% | 30% |
| Average Daily Production as % of Treatment Capacity | 35% | 37% |
| Peak Day Production as % of Treatment Capacity | 42% | 44% |

Sources: FY 2022 Customer and Billing Data, 2022 Water Loss Audit Report and 2022 CRW Annual Water Supply Report

## 3.4 Water Quality

Water quality is regulated by the Federal Safe Drinking Water Act and enforced through laws and regulations administered by the PADEP. CRW publishes an Annual Drinking Water Quality/Consumer Confidence Report as required by the United States Environmental Protection Agency (EPA). The Drinking Water Quality Report provides general information on the Water System and the results of water quality tests on drinking water for that calendar year as compared to permitted maximum contaminant levels (MCLs). CRW's 2023 Drinking Water Quality Report (which reports the results for calendar year 2022) concluded that CRW's treated water quality is good and continues to consistently exceed national quality standards.

In addition, water samples are taken and tested by a certified laboratory for the DeHart Dam influent, the finished water, and the distribution system for the following parameters: pH, total alkalinity, temperature, iron, total dissolved solids, and total hardness. The DeHart Dam and finished water are also routinely monitored for turbidity and total organic carbon. Finished water is also tested for fluoride, aluminum, chlorine residual levels, and orthophosphate levels. Orthophosphate levels are also monitored in the distribution system. A summary of the key test results for 2022, as published in CRW's annual Drinking

Water Quality Report or reported by CRW's certified laboratory, and their comparison to established MCLs is provided in **Table 3-3**.

The Department of Environmental Protection's Bureau of Safe Drinking Water conducted a site visit at the CRW'S Service Center on February 24, 2021. The samples collected for polyfluoroalkyl substances (PFAS) monitoring during the site visit indicated PFAS were not detected. CRW tests quarterly for PFAS compounds and lithium in 2023 for the Fifth Unregulated Contaminant Monitoring Rule (UCMR5) program for the EPA. Sampling from the first and second quarters in 2023 indicated no PFAS detection.

**Table 3-3: Summary of Key Test Results for 2022**

| Contaminant | Units | MCL | Levels Detected (2021) | Levels Detected (2022) |
|---|---|---|---|---|
| Barium | ppm | 2 | <0.010 | Not detected |
| Chlorine (Distribution Disinfectant Residual) | ppm | 4 | 0.16 – 2.12 | 0.26 – 2.07 |
| Fluoride | ppm | 2 | 0.68 | 0.51 |
| Nitrate | ppm | 10 | Not detected | Not detected |
| Total Trihalomethanes | ppb | 80 | 69.8 | 60 |
| Haloacetic Acids | ppb | 60 | 56.1 | 57.0 |
| Arsenic | ppb | 10 | Not detected | Not detected |
| Radium-226 | pCi/L | 5 | Not detected | 0.222 |
| Chlorine (Entry Point Disinfectant Residual) | ppm | Min. of 0.2 | 0.74 | 0.69 |
| Fecal Coliform or E.coli | ppm | 0 | 0 | 0 |
| Turbidity | NTU<br>% samples below 0.3 NTU | 1<br>95% | 0.329<br>100% | 0.109<br>100% |
| Lead | % samples below 15 ppb | 90% | 100% | 100% |
| Copper | % samples below 1.3 ppm | 90% | 100% | 100% |

Sources: 2023 Drinking Water Quality Report

As shown in Table 3-3, the drinking water quality of the Water System consistently meets MCLs. The CRW Drinking Water Department received a Notice of Violation in February. This violation was the result of an old calendar being utilized and Distribution site 703 was sampled in place of site 707. During the height of the COVID-19 pandemic, site 703 was being utilized in place of site 707. CRW switched back to the original

sampling plan during the 2nd quarter of 2021. This was not notated on the posted monitoring calendar.

EPA has launched several initiatives including the Long-Term 2 Enhanced Surface Water Treatment Rule (LT2) and Stage 2 Disinfectants and Disinfection By-Products Rule (DBP). LT2 is designed to reduce disease incidence associated with *Cryptosporidium* and other disease-causing microorganisms, while DBP2 protects against exposure to by-products of the treatment process. As part of the LT2, CRW's two water sources, the DeHart Dam and the Susquehanna River, were previously tested for *Cryptosporidium*. Testing conducted to date shows no indication of this organism at the DeHart Dam, and as such is classified as "Bin 1". Data from the second round of LT2 monitoring detected higher levels of *Cryptosporidium* in the Susquehanna River, and as such, was classified as "Bin 2" in 2019 and requires an additional 1-log treatment when the river is in use. With respect to the DBP rules, water samples taken from the distribution system have historically shown little indication of the presence of Total Trihalomethanes and Five Haloacetic Acids.

CRW's copper and lead survey analyses, which have been completed once every three years since 2007, have shown that copper and lead concentrations at residential taps remain well below MCLs. These results verify the success of CRW's corrosion control program, which includes the addition of soda ash and caustic soda to raise pH levels in the water supply to promote corrosion control. Orthophosphate is a key component of corrosion control in combination with the pH control strategy as evidenced by historic sampling results.

## 3.5 Future Safe Drinking Water Regulations

Regulations affecting the Water System continue to become more stringent. The following serves to summarize the status of several key regulatory actions that could impact CRW's operations, with each being described in more detail in the following paragraphs:

- Microbial and Disinfection Byproducts
- Fourth Six-Year Review
- Fourth Unregulated Contaminant Monitoring Rule (UCMR4)
- Fifth Unregulated Contaminant Monitoring Rule (UCMR5)
- Fifth Candidate Contaminant Monitoring Rule (CCL5)
- Sixth Candidate Contaminant Monitoring Rule (CCL6)
- Lead and Copper Rule Revisions
- Per- and Polyfluoroalkyl Substances (PFAS)
- Hexavalent Chromium (Cr-6)
- 1,4-Dioxane

### 3.5.1 Microbial and Disinfection Byproducts

The EPA is required to conduct a review of drinking water regulations every six years. As part of this process, the EPA evaluates all the existing drinking water regulations and determines if a revision is necessary based on new information regarding health effects, analytical methods, occurrence, and treatment data. The results from the Third Six-Year Review were published in January 2017. The EPA determined that eight contaminants were eligible for regulatory revision: chlorite, *Cryptosporidium*, *Giardia lamblia*, haloacetic acids (HAA5), heterotrophic bacteria, *Legionella*, total trihalomethanes (TTHMs), and viruses. Each of these contaminants is related to the balance between pathogen control and disinfection byproducts (DBPs). For example, higher disinfectant residuals may be required to address some of these contaminants, particularly

in premise plumbing; however, this would need to be balanced with potentially increased DBP formation and lower maximum contaminant levels (MCLs) for DBPs.

The EPA is currently holding meetings with stakeholders and will propose regulations that may augment and/or revise requirements for the following by July 31, 2024:

- Stage 1 and Stage 2 Disinfectants and Disinfection Byproducts Rules,
- Surface Water Treatment Rule,
- Interim Enhanced Surface Water Treatment Rule, and
- Long Term 1 Enhanced Surface Water Treatment Rule.

In conjunction with this effort, the EPA is also considering regulatory action for additional haloacetic acids (e.g., additional brominated species) and nitrogenous DBPs (e.g., nitrosamines, haloacetonitriles, and halonitromethanes). Final revised regulations are expected to be published in the Federal Register by September 30, 2027.

### 3.5.2 Fourth Six-Year Review

The EPA is required to conduct a review of drinking water regulations every six years. As part of this process, the EPA evaluates all the existing drinking water regulations and determines if a revision is necessary based on new information regarding health effects, analytical methods, occurrence, and treatment data.

The Fourth Six-Year Review is an Information Collection Request (ICR) for Contaminant Occurrence Data that began and was first announced in October 2018. This was followed by review and approval from the Office of Management and Budget (OMB) and the public comment period in October 2019. On June 3 2020, EPA sent a data call letter requesting primacy agencies to volunteer to submit contaminant occurrence data and treatment technique information collected from 2012 to 2019 for all regulated contaminants.

The results for the Fourth Six-Year Review was scheuled to be released in early 2023, but the results have not yet been released.

### 3.5.3 Fourth Unregulated Contaminant Monitoring Rule

The Unregulated Contaminants Monitoring Rule (UCMR) framework was designed to enable evaluation and prioritization of contaminants for inclusion in federal drinking water regulations to protect public health. The ongoing series of rule documents the occurrence of the contaminants on the most recent version of the Candidate Contaminant List (CCL) to determine if future regulation is warranted. The UCMRs require designated water systems (including all large systems exceeding a threshold size and a select group of smaller systems) to conduct sampling for the included contaminants over a finite period of time (e.g., 12 consecutive months over a 3-year window).

The Fourth Unregulated Contaminants Montioring Rule (UCMR4) required monitoring for 10 cyanotoxins (nine cyanotoxins and one cyanotoxin group) and 20 additional contaminants (two metals, eight pesticides plus one pesticide manufacturing byproduct, three brominated haloacetic acid (HAA) DBP groups, three alcohols, and three semivolatile organic chemicals (SVOCs)). The most recent UCMR4 data set (i.e., 2018 – 2020) was released in July 2021. Seven of the thirty contaminants monitored were detected at levels above the reference concentration – this included manganese and three groups of HAAs (HAA5, HAA6Br, and HAA9). The data are currently being reviewed by the EPA and were expected to be in final publication, as early as the second quarter of 2022; however, no additional updates have been released.

### 3.5.4 Fifth Unregulated Contaminant Monitoring Rule

The finalized Fifth Unregulated Contaminant Monitoring Rule (UCMR5) was released on December 27, 2021. It includes the monitoring of 29 per- and polyfluoroalkyl substances (PFAS) and one metal, lithium. The rule requires Public Water Systems to conduct monitoring over a 12-month period between January 2023 and December 2025. Systems could potentially experience increased sampling costs and stakeholder pressure to address PFAS, if detected. Though not required, many systems proactively implemented PFAS treatment based on findings from the Third Unregulated Contaminant Monitoring Rule (UCMR3). USMR5 sample results from the from the first two quarters of 2023 were non-detect for all 30 contaminants.

### 3.5.5 Fifth Candidate Contaminant List (CCL5)

The Fifth Candidate Contaminant List (CLL5) was finalized by the EPA on November 14, 2022. It includes a total of 81 contaminants or groups consisting of 66 chemicals, 12 microbial contaminants, and three chemical groups. The chemical groups include one group of cyanotoxins, one group of 23 disinfection byproducts, and one group of PFAS chemicals. EPA is in the process of evaluating these contaminants to determine which ones have sufficient information available to make a regulatory determination. Research will be encouraged for those contaminants without enough data to make a determination. A regulatory determintation is required withon 5 years after the previous round of regulatory determinations is completed, so regulatory determination for CCL5 is expected by 2026.

### 3.5.6 Sixth Candidate Contaminant List (CCL6)

The EPA requested nominations of contaminants for the Sixth Candidate Contaminant List (CCL6) on February 17, 2023. The deadline for submitting nominations was April 18, 2023, and EPA is currently evaluating the nominations for potential inclusion in CCR6. The draft CCL6 is anticipated in 2026.

### 3.5.7 Lead and Copper Rule Revisions/Lead and Copper Rule Improvements

On January 15, 2021, the EPA published the final Lead and Copper Rule Revisions (LCRR), which became effective as of December 16, 2021 and focuses on improving public health protection via a proactive and holistic approach by requiring earlier action and improved transparency and communication by utilities to reduce risks around lead in drinking water. The compliance date is October 16, 2024, to ensure systems have time to act and comply with the new rule. The LCRR includes over fifty significant changes in all areas from monitoring and treatment to service line inventories and customer communication. Key changes include:

- **Action Level (AL) and Exceedances.** Although the existing lead AL of 0.015 mg/L would be maintained, the LCRR includes a new "trigger" level (TL) of 0.010 mg/L for lead, which would initiate requirements if exceeded at the 90th percentile. This approach initiates upfront action for systems, including additional requirements for monitoring, corrosion control treatment (CCT), LSL replacement, and public education to reduce lead in drinking water before exceeding the AL.

- **Lead Service Line (LSL) Definition.** The LCRR provided additional information around the definition of a LSL. Per 40 CFR part 141, a LSL is a portion of pipe that is made of lead, which connects the water main to the building inlet. A galvanized service line is considered a LSL if it ever was or is currently downstream of any LSL or service line of unknown material. If the only lead piping serving the home is a lead gooseneck, pigtail, or connector, and there is no galvanized downstream it is not considered a LSL.

- **Lead Service Line Inventory (LSLI) and Replacement.** Systems with known or possible LSLs must develop and maintain a publicly accessible inventory and a LSL replacement plan within the first three years of the published rule. Systems with LSLs that exceed the lead TL or AL at the 90th percentile would be required to conduct full LSL replacement at a goal-based rate agreed upon by the primacy agency/EPA or at a 3-percent rate per year based on a 2-year rolling average, respectively.

- **Tap Sampling.** The LCRR shifts tap compliance sampling to locations with the highest lead, requiring systems to collect from 100% LSL sites, if available. Sampling protocols for sites served by a LSL are also updated – the rule requires a first liter copper sample and fifth liter lead sample.

- **Corrosion Control Treatment.** Systems with existing CCT that exceed the AL or TL would be required to conduct a CCT study and comply with new study requirements including the evaluation of pH/alkalinity adjustment, and orthophosphate doses of 1 and 3 mg/L as PO4-3 in a CCT study. Additionally, systems would not be allowed to exclude orthophosphate from testing solely based on expected downstream impacts (i.e., open reservoirs, publicly owned treatment works) due to increased phosphorous loading.

- **Public Notification.** Systems with a 90th percentile lead level exceeding the AL must notify customers within 24 hours, and systems with customers whose individual lead tap samples exceed 0.015 mg/L must notify customers not later than three days after obtaining results.

- **Find-and-Fix Assessment.** New to the LCRR, for any lead sample (compliance or voluntary) that exceeds 0.015 mg/L, systems would be required to sample water quality parameters within five days and collect a follow-up lead tap sample within 30 days to "find" the cause and then "fix" it if within the utilities control.

- **Schools and Childcare Facilities.** New to the LCRR, CWSs would need to collect lead samples at 20 percent of all schools and childcare facilities per year.

Following the effective date, on August 4, 2022 the EPA released additional LSLI guidance to help support public water systems on how to develop and maintain service line inventories and effectively communicate and notify customers served by a lead service line to ensure compliance with the LCRR.

Additionally the EPA is expected to draft and finalize further revisions via the Lead and Copper Rule Improvements (LCRI) prior to the compliance date of October 16, 2024. Focus areas of proposed rulemaking under the LCRI include:

- Replacing all LSLs and prioritizing replacements in historically underserved communities,
- Strengthening compliance tap sampling requirements, and
- Reducing complexity and confusion around the trigger and action levels for lead.

PADEP also released guidance for investigating and classifying service lines in their July 2022 Drinking Water Newsletter. It includes evidence-based verification methods for service lines categorized as "non- lead" and definitions for other service line categories. Notably, service lines should be categorized as "Galvanized Requiring Replacement" if the service line ever was or is currently downstream of a lead service line; a lead gooseneck pigtail, or connector; or is currently downstream of a "Lead Status Unknown" service line. PADEP

is also expected to develop a detailed Excel-based service line inventory form that will be available on PADEPs LCR website in the future.

### 3.5.8 Per- and Polyfluoroalkyl Substances (PFAS) Rules

Per- and polyfluoroalkyl substances (PFAS) are man-made chemicals that are used in a variety of industries and consumer products such as carpeting, apparels, upholstery, food paper wrappings, fire- fighting foams, and metal plating. PFAS are prevalent in the environment, and studies have shown adverse human health effects at extremely low levels.

In November, 2021 Pennsylvania Department of Environmental Protection promulgated the PFAS MCL Rule, setting MCL values for PFOA and PFOS in drinking water of 14 ng/L and 18 ng/L, respectively. CRW tested finished water for PFAS under the UCMR3 in December 2015 and independently in 2019. DEP performed tests in on February 24, 2021. Additional PFAS sampling was conducted under the UCMR5 in the first two quarters of 2023. All test results were below detection limits.

On March 14, 2023 the USEPA proposed a national primary drinking water regulation for PFAS. The regulation proposed MCL values for six PFAS compounds. Four of the PFAS are regulated as a group, by defining a hazard index that is the sum of the concentrations of the PFAS divided by health-based concentrations set for each of the PFAS chemicals in the group. The proposed MCLs are summarized in Table 3-4. A final rule is anticipated to be released in December 2023.

**Table 3-4: USEPA Proposed PFAS MCLs**

| Compound | Proposed MCL |
|---|---|
| PFOA | 4.0 ppt |
| PFOS | 4.0 ppt |
| PFNA | Hazard Index of 1.0<br><br>where Hazard Index =<br><br>([GenX]/10 ppt)<br>+ ([PFBS]/2000 ppt)<br>+ ([PFNA]/10 ppt)<br>+ ([PFHxS]/9 ppt) |
| PFHxS | |
| PFBS | |
| HFPO-DA (GenX Chemicals) | |

In July 2020, EPA finalized a Significant New Use Rule (SNUR) that requires manufacturers (including importers) of products or chemicals containing PFOA and certain PFOA-related chemicals to notify EPA 90 days before manufacturing, selling, or importing in the United States. In January 2023, EPA proposed another SNUR that would prevent anyone from resuming use of inactive PFAS, which are not covered under the existing SNUR. The EPA also finalized a list of 172 PFAS chemicals that are subject to Toxic Release Inventory reporting in 2020. In 2021, another four PFAS were added to the list for a total of 176 listed PFAS chemicals.

Other potential federal PFAS regulations that may affect drinking water systems are incorporated into the PFAS Action Act, which was passed by the House on April 13, 2021 and is current pending a vote in the Senate. On August 26, 2022, the EPA proposed to designate both PFOA and PFOS as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). If finalized, facilities will need to report PFOA or PFOS releases that meet or exceed the reportable quantity, potentially

accelerating privately financed cleanups and mitigating adverse impacts human health and the environment. There is also the potential for significant impacts on the management of water treatment plant residuals (e.g., spent granular activated carbon (GAC) and ion exchange (IX) resin) and associated costs. Comments on the proposed rule were received until November 7, 2022 and a final rule is expected to be published in 2023.

In April 2023, EPA issued an Advanced Notice of Proposed Rulemaking (ANPR) to solicit input and data regarding potential future hazardous substance designations for seven additional PFAS compounds under CERCLA. The comment period for the ANPR ended on August 11, 2023 and EPA is currently reviewing information received. This indicates the potential for more PFAS to require reporting of releases in the future.

In December 2022 EPA issued guidance on addressing PFAS in National Pollutant Discharge Elimination System (NPDES) permitting. Guidance for PFAS in discharges has the potential to reduce PFAS in source waters, but may also impact water treatment facilities with NPDES permits.

### 3.5.9 Other

#### *3.5.9.1. Hexavalent Chromium*

The EPA has an enforceable drinking water standard of 100 micrograms per liter (µg/L) for total chromium, which is the sum of the concentrations of all states of the metal chromium (Cr), including chromium (III) and chromium (VI) (i.e., Cr-6 or hexavalent chromium). The EPA released a draft human health risk assessment for Cr(VI) in 2010, and the date for issuance of a final assessment has not yet been published, a step that would be required prior to the EPA establishing a new drinking water regulation for Cr(VI). As a part of the Third Six-Year Review, the EPA declined to review the existing chromium standard due to the ongoing human health risk assessment. A draft toxicological review for Cr(VI) was released in October 2022 for external review. Within three years following completion of the assessment, the EPA will determine if the existing regulation is appropriate.

In the interim, EPA requested voluntary Cr(VI) sampling of finished water at points-of-entry and at maximum residence time sampling locations. CRW has conducted voluntary Cr(VI) sampling of the finished water at AWTF and River Pump Station (the spot in the distribution system with high water age), from January 2017 through November 2020. Results have ranged from non-detect (<0.10 µg/L) to 0.39 µg/L.

#### *3.5.9.2. 1,4-Dioxane*

The EPA has indicated that it has not determined if there is value to move forward with federal regulation of 1,4-dioxane in drinking water. In July 2023, an draft update to a December 2020 risk evaluation incorporating assessment of risk associated with drinking water was released, and is open for public comment until September 8, 2023. In the draft risk determination, EPA proposes to determine that 1,4-dioxine, as a whole chemical substance, presents unreasonable risk to human health. If the final risk determination is that 1,4-dioxane presents unreasonable risk to human health, then EPA will begin developing proposals to reduce the risk, which may include limitations on drinking water. However, some states have established or are moving forward with the process of establishing an MCL for 1,4-Dioxane in drinking water as described in **Table 3-5**.

**Table 3-5: Current 1,4-Dioxane Regulations by State**

| State | Value (µg/L) | Type | Status |
|---|---|---|---|
| Massachusetts | 0.3 | Guideline | Promulgated |
| California | 1 | Notification Level | Promulgated |
| | 35 | Response Level | |
| New York | 1 | MCL | Promulgated |
| Virginia | n/a | MCL | In development |
| Florida | 0.35 | Health Advisory Level | Promulgated |
| New Jersey | 0.33 | Recommended MCL | In development |
| Minnesota | 1 | Guidance | Promulgated |

### 3.5.10 Summary

CRW has been in discussion with the PADEP regarding the potential need to increase the spillway of the Dam to meet 1990 regulations, which require spillway capacity equal to the maximum storm flow. PADEP completed a state-wide precipitation study in March 2020 enabling CRW to proceed with plans to expand spillway capacity for storms of record. AECOM facilitated a Probable Failure Modes Workshop for the DeHart Facility with participation by PADEP Dam Safety Division and CRW in August 2020. The findings from that workshop are informing the design of improvements to CRW's DeHart Dam spillway and embankment. A spillway design project began in 2021 to increase the spillway capacity and is planned to enter construction in 2025.

It is recommended that CRW be ready for the Lead and Copper Rule Revisions to take effect October 2024 and review the PADEP service line guidance material. The revisions will have impacts to CRW, ranging from increased sampling to proactive public education and lead service line replacement.

EPA has released proposed MCLs for six PFAS in drinking water; it is recommended that CRW track activity for finalization of federal level drinking water PFAS regulations and closely follow Congress's actions for designating various PFAS compounds as hazardous substances under CERCLA.

# 4.0 WATER SYSTEM CONDITION

## 4.1 Overview

CRW staff aim to ensure the entire Water System is properly operated and maintained. The cost to provide routine and preventative maintenance is included in CRW's annual operating budget. CRW uses a proactive preventative maintenance program and a systematic replacement policy for inventory parts to minimize downtime.

Additionally, CRW developed a comprehensive asset management program for the drinking water systems which will further enhance preventative maintenance and increase system reliability. Asset registries have been developed for all CRW treatment plants, pumping stations, storage facilities, and the DeHart Dam facility. CRW has developed a risk register for CRW's buried assets and established high-level replacement, rehabilitation, and condition assessment cost estimates. Currently, CRW is using a non-invasive acoustic based inspection technology and is annually budgeting and performing condition assessments in the water distribution system.

Development of the Drinking Water System Asset Management Plan was completed in July 2020. The plan provides CRW with strategies for operations, maintenance, capital investments, and funding.

## 4.2 Condition Assessment

Gannett Fleming conducted a limited condition assessment of the key components of the Water System on July 28, 2023, which included a review of existing information provided by CRW, discussions with CRW staff, and visual observations during field visits. Based on the type of facilities, available documents related to the facilities, and previous experience with similar facilities, a representative sample of facilities was inspected on a limited basis to visually confirm the information provided, identify any apparent capital improvement needs, and discuss reliability and O&M performance with the operation and maintenance staff. No field investigations were conducted for buried infrastructure.

The condition assessment of the facilities in the Water System was based on numerical ratings for the following criteria:

- Appearance of mechanical, structural, and electrical components
- Reliability
- O&M performance
- Capacity
- Regulatory compliance

Based on the evaluations using the above categories, an overall risk rating was assigned to each of the major assets. The risk ratings for each of the five categories above are outlined in **Table 4-1**.

**Table 4-1: Summary of the Rating System**

| Numerical Rating | Interpretation of Rating | Description |
|---|---|---|
| 1 | Little to no risk | Relatively new and in good physical and operating condition. |
| 2 | Some risk | Good condition, no known capital requirements. |
| 3 | Moderate risk | Aged or worn but generally in good operating condition may require capital investment within five years. |
| 4 | Significant risk | Operational but nearing end of life and/or requires investment to bring to full operating condition. |
| 5 | High risk | Should be on high priority for renewal and/or replacement. |

The following **Table 4-2** presents a summary of the risk ranking for each of the major facilities based on a review of the available information and limited visual inspections.

| Major Asset | Risk Rating | Change from Prior Year |
|---|---|---|
| DeHart Dam and Reservoir | 3.0 | No Change |
| Dr. Robert E. Young Water Services Center | 1.2 | No Change |
| Upper Reservoir | 2.0 | No Change |
| Lower Reservoir #1 | 2.2 | Increased |
| Lower Reservoir #2 | 2.2 | Increased |
| Pump Stations<br>Susquehanna River Pump Station (1.0)<br>Gate House Pump Station (1.1)<br>Union Square Booster Station (1.2) | 1.1 | No Change |
| Transmission Mains<br>Mountain Line (3.0)<br>Susquehanna Line (1.1)<br>Plant-Gate-House-Reservoir Line (1.7) | 1.9 | No Change |
| Distribution System | 2.7 | Decreased |
| **Overall System Rating** | **2.0** | **No Change** |

**Table 4-2: Major Assets Risk Rating**

Overall, the Water System is in good condition and the risk rating had little change over the year prior; however, some components are aged and will require investigation and capital investment to preserve the asset and maintain high-quality water and adequate delivery of services. Although various upgrades (chemical systems, new/refurbished equipment) were implemented at the Water Services Center, the risk rating remains unchanged due to the overall criticality of the asset. The risk for the Gate House Pump Station was decreased to 1.1 due to the rebuilding of the pumps and motors that occurred in 2022; however, this did not impact the overall Pump Stations rating. The risk for both the Lower Reservoirs was increased to 2.2 due to the ongoing need for inspection. The rating for the Distribution System was lowered to 2.7 based on the pending meter replacement project and continued CRW investments in water main replacement efforts.

CRW completed arc flash studies in 2022 for the water system to be in compliance with current NFPA 70E and OSHA 1910 (Subpart S) regulations.

The following subsections provide a summary of the current condition of the major components, the rationale for the risk scores assigned, and the improvements needed to address moderate, significant, and high risks.

### 4.2.1 DeHart Dam, Reservoir Control Building, and Chemical Feed Facility

CRW routinely monitors and evaluates the DeHart Dam to ensure operational efficiency and regulatory compliance. These regulations include annual inspections, followed by a PADEP on-site review. The implemented O&M tasks include the management of vegetation encroaching the embankment on the upstream and downstream faces of the dam and vegetation clearing along the mountain line pipeline route. Out of the approximately 12 to 16 miles of pipeline that require vegetation clearing, all vegetation clearing has been completed. Crews continue to upgrade the pathway along the pipeline for improved vehicle and equipment access. Crews replaced multiple panels in the spillway in late 2019/early 2020. A spillway design project began in 2021 to increase the spillway capacity and is planned to enter construction in 2025.

In addition to the O&M items above, AECOM completed a Preliminary Engineering Report which was used to aid in the development of design alternatives to address the current deficiencies at DeHart Dam.

Deficiencies previously noted in past reports included the following:

- Lack of Embankment Seepage Control and Collection System. The existing embankment does not have a comprehensive system to filter and collect all seepage, and adjacent soils need to meet filter compatibility requirements to prevent soil particle migration or internal erosion that can lead to failure of the dam embankment under certain reservoir level and associated seepage conditions. In the summer of 2018, a comprehensive geotechnical evaluation was conducted on the existing embankment to determine its filter compatibility requirements. A report including the geotechnical evaluation findings was submitted April 2019.
- Insufficient Spillway Capacity. The existing spillway at Dehart Dam is not capable of passing the Probable Maximum Flood (PMF) Spillway Design Flood. Evaluation of the hydrologic and hydraulic analysis was completed in February 2020. Construction on the spillway is set to begin in 2025.
- Questionable Structural Adequacy of the Spillway Channel. Due to the use of channel slab construction that is no longer common practice, and the limited footprint of the existing underdrain system, the structural integrity of the slabs can be compromised if water from spillway channel flows is able to penetrate beneath the slabs. Evidence of undermining and deterioration of the existing spillway slabs and walls was noted during the inspection.

- Insufficient Drawdown Capacity. The Dehart Dam does not have adequate drawdown capacity per the PA code that is intended to ensure that the reservoir could be lowered as a risk reduction measure in the event of a developing incident or failure mode.

Following AECOM's 2022 Annual DeHart Dam inspection, the list of recommendations below was made in their report:

- Monitor the low spots near the left and right spillway abutment cutoff walls.
- Investigate the cause of the erosion around the embankment fence post supports.
- Remove vegetation growing on the upstream slope of the embankment.
- Fill in the low spot observed in the upstream slope protection. In conjunction with the future rehabilitation project, extend the riprap projection on the upstream slope to the embankment.
- Monitor the wet spots observed at the project, particularly the new wet spot observed on the embankment downstream slope, approximately mid-height at the maximum section, on the access road that was constructed during previous subsurface investigations.
- Monitor the active seepage along the left embankment groin and toe.
- In conjunction with the future rehabilitation project, armor the access road at the downstream slope of the embankment and replace displaced riprap along the groin of the embankment.
- In conjunction with the future rehabilitation project, remove the woody vegetation at the main embankment downstream slope.
- Continue to monitor the piezometers, weirs, and reservoir level at the specified frequency intervals.
- Replace the missing weirs that were located at the 16-inch HDPE pipe outfall in the spillway chute wall and at the 12-inch PVC pipe underdrainage system outfall channel in the spillway chute slab.
- In conjunction with the future rehabilitation project, install survey monuments across the crest of the embankment dam in order to monitor movement.
- In conjunction with the future rehabilitation project, replace the spillway bridge which was found to be in poor condition.
- In conjunction with the future rehabilitation project, repair the noted chute wall deficiencies. In the meantime, continue to monitor for further deterioration or additional removal of shotcrete overlay.
- In conjunction with the future rehabilitation project, repair the noted spillway weir deficiencies. In the meantime, continue to monitor for further deterioration or erosion of slab at toe of weir.

Additional items requiring action from the site visit include:

- Repair or replace broken window panes on the intake house.

Work completed since last CEAR:

- Replaced roof and parapet caps on the control room
- Replaced actuators for flow by water to the creek and water to WSC
- New sidewalk, porch, and driveway for houses on the property
- New crane and hoist

AECOM's December 2020 Preliminary Engineering Report developed three alternatives for modification to the spillway crest structure in order to pass the spillway design flood with adequate freeboard. The alternatives were developed with the understanding that improvements to the spillway chute, stilling basin, embankment dam, and outlet works would be made that are common to each spillway crest alternative. An engineer's opinion of construction cost was prepared for each alternative in this report.

Currently, the rehabilitation of the spillway crest and chute is scheduled to begin in 2025. The DeHart Dam rehabilitation project consists of preliminary design and laboratory investigations, along with permitting, final design, bidding, and construction. The CIP shows approximately $24M for spillway rehabilitation with construction starting in 2025 and completed by 2026.

Additionally, the replacement of the generator and transfer switch at Dehart Dam is currently out to bid and expected to be completed.

### 4.2.2 Dr. Robert E. Young Water Services Center Treatment Facility

The Dr. Robert E. Young Water Services Center (WSC), located at the intersection of Pine Drive and Stanley Drive on the City's municipal border with Susquehanna Township, treats raw water conveyed from either the DeHart Reservoir or the Susquehanna River. It also contains CRW's maintenance garage. It utilizes chemical addition, flocculation, coagulation, sedimentation, filtration, and disinfection to produce the Water System's finished water.

Based on the calendar year 2021 and 2022 Drinking Water Quality Reports, the water provided by the plant was of high quality and consistently exceeded performance requirements as determined by State and Federal regulations. In addition, PADEP gave the filter plant a "satisfactory" performance rating for its ability to consistently produce high-quality water and provide long-term reliability in its 2021 Filter Performance Evaluation Report, maintaining its previous rating in the 2016 Report. Nonetheless, PADEP identified the following issues and concerns requiring investigations or improvements:

- The current combination of Extended Terminal Subfluidization Wash (ETSW) and filter to waste appears to be insufficient in sending the post backwash turbidity to waste. One full filter volume should be purged via ETSW prior to filter to waste being initiated.
- The even filters and odd filters empty into two respective clearwells that operate in parallel and the interconnection at the head of each clearwell is normally kept open. Each clearwell has a separate flow meter and separate high service pumps. Due to the fact that these clearwells operate in parallel and can have differing effluent flow rates, CRW is being asked to begin calculating LogG (Giardia Log Inactivation) on each clearwell.
- Required alarms for turbidity, entry point disinfectant residual and water levels to maintain adequate Giardia inactivation are not tested at least quarterly and recorded. Begin testing alarms and maintain a written log as required.
- CRW had implemented a filter bed evaluation program in 2019, but it is not currently implemented. Ensure that all activities are completed at the minimum frequencies.

A Filter Upgrade Project was completed in 2020 which repaired underdrain deficiencies and replaced all filter media to improve the operational performance of the Filtration Process. The controls associated with the filters were replaced in 2022.

The chlorine disinfection system at the WSC has several safety features, including automatic shut-off valves, exhaust fans, and a chlorine gas scrubber capable of collecting and neutralizing chlorine gas from an accidental 1-ton tank discharge.

The plant appears to be in good overall physical condition. However, some capital investments will be required within the next five years in response to PADEP comments and some additional O&M expenditures should be incurred to improve the resiliency of its operation and satisfy the expectations of the regulatory agency.

During the site inspection, a variety of improvements were noted to have been performed in the last year. The filter room rooftop was rebuilt in 2022 and the filter consoles were all upgraded. Several filter actuators were replaced in 2022 with more planned to be replaced in the coming year. A new filter effluent sample pump was installed in the summer of 2023. Additionally, transmitters were replaced for the filter turbidimeters, differential pressure transmitters, and flow meters. One turbidimeter was equipped with a bubble trap to improve reading reliability. Bubble traps are planned to be added to the remaining turbidimeters following a successful implementation of the first installation.

New plant water booster pumps were installed since the last CEAR inspection. The roof and the HVAC system in the pump room were replaced within the last year as well. Isolation valves were installed on the post clearwell line to prevent backflow in case of power loss and a new magnetic flow meter was installed on the clearwell effluent line as well as on the plant water supply line. The finished water and backwash pumps and motors were rebuilt and mechanical seals and motor disconnects were added within the last two years and their suction pressure and discharge pressure transmitters were replaced. CRW replaced the existing HACH pH probes with Endress-Hauser pH probes and two chlorine analyzers were added to monitor chlorine levels on each clearwell effluent line independently, addressing the comment from DEP's FPPE.

A new sample pump was installed for raw water post-chemical addition samples. The HMI and control panel were upgraded for the caustic soda system and alum feed pumps were replaced. The containment areas in the chemical storage room were repainted in 2023. A fluoride feed pump was also replaced and the bulk chemical fill station was rebuilt in 2023. New railing was erected around the sludge (backwash) tank in April 2023 and a new monorail system and new heaters were recently added to the chlorine room.

CRW is currently moving the Supervisory Control and Data Acquisition (SCADA) system from the control room to PLC 16 and 16A. Further, a new HVAC system was installed for the upper chemical area, control room, offices, and basement in 2022. Over the past four (4) years, the maintenance crew replaced all lighting throughout the Water Service Center; the light replacement project was completed in 2022. Additionally, the alarm for the fire sprinkler system was replaced along with the emergency lighting.

During the site inspection CRW indicated several recommended/planned O&M improvements at the facility including the following: new filter effluent sample pump, replacing windows in the filter room, upgrades to the plant laboratory and locker room, repairs to the salt shed, installing two actuators on post clearwell finished water lines to close on plant power failure for redundancy, as well as rebuilding or replacing the sludge pumps. CRW also plans to relocate the chlorine tanks in 2024 to facilitate exit from the storage area in case of emergencies. Mixers from the carbon system are set to be installed in the backwash basin to promote better mixing in 2024. New railing is scheduled to be built around the sedimentation and flocculation basins in 2024; the concrete around the basins will be resurfaced upon completion of the railings. The windows in the maintenance building are planned to be replaced in the end of August 2023. There are ongoing upgrades for the lime and orthophosphate chemical feed systems and alterations to the

fluoride tank overflows are set to be completed in the fall of 2023. Next year, CRW plans to reconfigure fluoride feed piping.

### 4.2.3 Finished Water Reservoirs

The Water System utilizes three reservoirs to store finished water for distribution throughout its service area. The reservoirs are located at Reservoir Park within the City and serve two different pressure districts.

The Lower Reservoir consists of two six-million-gallon circular tanks constructed in 2002. This facility serves consumers who are generally located west of Eighteenth Street within the City. The Lower Reservoir has an overflow elevation of 504 feet and connects to the distribution system through a supply pipe that ranges in size from 30 to 36 inches in diameter. The last interior inspection of the Lower Reservoir tanks was completed in 2010. A subsequent inspection of the Lower Reservoir and WSC Clearwell is recommended for 2024. The inspection is intended to review and document the condition of the tanks. Gannett Fleming did not visit the vault containing the discharge piping because the vault is a confined space. The tanks appear to be in good overall condition based on exterior inspection; however, the concrete on the exterior walls has extensive hairline cracks with efflorescence and extensive discoloration caused by a biological film. The tanks should be power washed in 2024 and may require recoating to prevent further deterioration of their exteriors. CRW should monitor the cracks to ensure that water is not penetrating to the wire wrapping.

The Upper Reservoir is an underground reinforced concrete reservoir constructed in 1927. It has a storage capacity of 28.0 million gallons and is divided into two compartments. The Upper Reservoir serves the Water System's high-pressure zone. It supplies water to customers located east of Eighteenth Street within the City and in portions of Penbrook, Susquehanna, Swatara, Paxtang Borough, and Lower Paxton. A rehabilitation project of the upper reservoir was completed in early 2019.

### 4.2.4. Susquehanna River, Gate House, and Union Square Pump Stations

CRW's Water System utilizes three pumping stations to convey water and maintain adequate distribution system pressure. The Susquehanna River Pump Station is located within the City, between Front and River Streets, north of Graham Street, and is used to transfer raw water from the Susquehanna River to the Dr. Robert E. Young Water Services Center. The facility draws water from the river via an inlet tunnel connected to four wedge wire screens located in the river. It was constructed in 1994. CRW typically exercises the equipment at the facility once per year for a ten-day period because of CRW's preference for utilizing water from the DeHart Reservoir. Overall, the facility appears to be in good condition and able to perform adequately. Piping in the lower level of the pump station is showing signs of minor corrosion; it is recommended that this piping be visually inspected annually and painted at the first signs of structural corrosion. CRW plans to paint the pumps and associated piping in early 2024. Additionally, CRW plans to replace the existing potassium permanganate feed system with a sodium permanganate drum feed system.

The Gate House Pump Station is located at the City's Reservoir Park and is used to transfer finished water from the Lower Reservoir or the Dr. Robert E. Young Water Services Center to the Upper Reservoir. It was constructed in the 1920s. The most recent significant upgrade was in 1994. CRW typically operates at least one pump for 12 hours each day, and the lead pump is rotated quarterly to balance pump runtime between the pumps. The facility appears to be in good condition and able to perform adequately. Painting of the pump station interior walls was completed in late 2020. Additionally, finished water pumps, motors, and seals were rebuilt in 2022, and disconnects were added. The stairs, pipes, and floors in the pump station were repainted in 2022. A backup generator was installed in late 2021 and the heaters were repaired inside the pump station in June 2022.

The Union Square Industrial Park Booster Station is located within Susquehanna Township along Susquehanna Township's municipal border with Lower Paxton Township and is used to increase the water pressure within the outer reaches of CRW's distribution system, which serves the Union Square Industrial Park. It was constructed in the mid-1990s. CRW rarely operates the facility because the system pressure is adequate for normal demands. The facility appears to be in good condition and able to perform adequately. The piping, pump, supports, and fuel tank were painted in July 2020. Some paint chipping in the interior of the building was observed on the ceiling. A ceiling repaint is scheduled for the winter of 2023. CRW is also planning to add a new man gate at the pump station entrance in 2023.

### 4.2.5. Water Transmission System

CRW has several water transmission mains. The most important transmission mains are the DeHart Dam raw water line, known as the Mountain Line, the raw water transmission main connecting the Susquehanna River Pump Station to the Dr. Robert E. Young Water Services Center, and the finished water transmission main connecting the Dr. Robert E. Young Water Services Center to Reservoir Park.

The Mountain Line is a reinforced concrete and pre-stressed concrete cylinder pipeline that was placed into service in 1940. The portion of the pipeline through the Dauphin Narrows was relocated by the Pennsylvania Department of Transportation in 1965 when it was widening State Route 22/322 and again in 1999 as a result of work by Conrail.

CRW retained Pure Technologies Ltd. to investigate the Mountain Line in 2016 using its Smartball™ leak detection technology. The draft Condition Assessment 42- and 36-Inch Raw Water Transmission Main Report, dated August 2017 noted that three leaks were identified in the inspected portions of the Primary Transmission Main, and zero leaks were found on the A-Line and B-Line. Recommendations for the long-term management of the transmission main were included in the condition assessment and include the following:

- Calibration testing including excavation of pipe segment with anomalies to qualify the distress detected.
- Complete an electromagnetic inspection of the B-Line.
- Confirm the air release valve in Chamber #4 at Station 118+55 on the B-Line is properly working.
- Verify there is a pipeline feature located at Penwood Road and Antoine Street where a Type 3 anomaly was identified.
- Electromagnetically re-inspect the Raw Water Transmission Main every 5 to 7 years to monitor the rate of distress.

Following the condition assessment in 2017, CRW performed the recommended calibration testing to address the identified anomalies; however, the recommendations that involved destructive testing of the pipeline were not performed due to being detrimental to operations. CRW is committed to $82,500 per year for repairs to the Mountain Line.

The Susquehanna River transmission main is a pre-stressed concrete cylinder pipeline that was placed into service in 1994. The Susquehanna River PS and associated transmission main are operated once per year for a 10-day period to exercise the equipment as recommended by PADEP. In 2017 the Susquehanna River PS was operated for 10 days and provided the full flow to the WTP. The 2017 operational exercise was helpful in draining and maintaining the Mountain Line. Between October 25th and November 4th, 2022, CRW operated the Susquehanna River PS to provide 50% of the capacity to the WTP with the remaining

50% capacity coming from the DeHart Dam. This strategy is an operational exercise for reliability during a potential emergency.

The finished water transmission main from the Dr. Robert E. Young Water Services Center was installed in 1994 and constructed out of 36-inch diameter prestressed concrete cylinder pipe. The transmission main is approximately 3,400 feet in length and connects to the existing 30-inch diameter ductile iron pipe transmission main to Reservoir Park at the intersection of 18th Street and State Street. This main is arguably the most critical main in the Water System. CRW has indicated that there are no known issues with the pipe and that it has corrosion control measures in place. The physical condition of this pipe is unknown. CRW is committed to the annual execution of condition assessment utilizing internal workforce and contracted specialty services (currently $100,000/year).

### 4.2.6. Water Distribution System

CRW's water distribution system includes approximately 220 miles of water main distribution pipe, 1,800 fire hydrants, 5,370 main valves, and 19,900 service valves.

#### *4.2.6.1 Delivered Water Quality*

CRW provides the PADEP with monthly reports on the quality of its delivered water and publishes an Annual Drinking Water Quality/Consumer Confidence Report, as required by the EPA. The Drinking Water Quality Report provides the results of water quality tests on CRW's drinking water for the year as compared to permitted MCLs. CRW's 2023 Drinking Water Quality Report (which reports the results for the calendar year 2022) concluded that CRW's water quality continues to consistently exceed national quality standards.

CRW has a routine sampling plan. Its day-shift plant operators collect more than the minimum number of routine total coliform samples required from sites of commercial customers including customers located where the longest detention time is expected. CRW also maintains a detectable disinfection residual in its distribution system verified by the same sampling program used to monitor the absence of total coliform organisms in the water. It also monitors for disinfection by-products as required by the EPA and has been in compliance since 2012.

CRW maintains records of aesthetic water quality complaints and their resolution. It reports the number of water complaint calls in the Water Division Monthly Report. Aesthetic complaints are infrequent and most often a consequence of CRW's hydrant flushing program.

CRW monitors 30 sites triennially in accordance with a sampling plan as required by the EPA for systems complying with the lead and copper rule. In addition, CRW flushes its distribution system at all hydrants beginning in the spring of each year and starting with the finished water storage and working to the outskirts of the distribution system.

CRW's delivered water quality program appears to be consistent with Section 4.1 of American Water Works Association (AWWA) Standard G200 - Distribution Systems Operation and Management, based upon a limited review of documentation and an interview with CRW staff on July 28, 2023.

#### *4.2.6.2 Distribution System Management*

CRW maintains the water in its finished water storage reservoirs at levels high enough to avoid low pressure complaints from customers. It monitors the water levels in the reservoirs but does not otherwise monitor the pressure in the distribution system. It posts "boil water" notices on its website for repairs or maintenance causing loss of pressure to customers.

CRW has updated its Cross-Connection Control Manual in compliance with Part VII, Cross-Connection Control / Backflow Prevention of the PADEP Public Water Supply Manual. Program implementation requires appropriate municipal ordinances and up to five years to educate customers, have customers install backflow preventers as appropriate, and to initiate a backflow device testing program. A concrete date for the backflow prevention implementation has not been established. CRW is unconcerned about organic solvents permeating into the system through PVC piping because it does not have any PVC piping in its system.

In 2016 CRW initiated a leak detection program that includes full system leak detection on an annual basis. The leak detection program involves the evaluation of mains and service lines and the preparation of meter calibration reports to summarize findings. Small and Large Meter Testing Programs are incorporated as part of the leak detection program to ensure accurate readings are being taken and water loss is minimized. Small meters are calibrated by CRW staff on a certified calibration stand. while large meters are calibrated by a contracted calibration service and are assisted and witnessed by CRW staff.

Large meters that are expected to be replaced that have turbine technology, are of Neptune brand, are older than 15 years of age, or otherwise have a condition that makes replacement financially favorable over testing. On average, CRW can replace approximately 25 large meters per year. In addition, CRW replaces on average between 300 and 400 small meters per year due to inaccurate readings, freezing, and theft. An analysis of CRW's existing small meters showed that a large number of meters in the system are nearing the end of their useful life and are experiencing degrading accuracy. Further, newer technologies are available for advanced metering infrastructure that enable the automation of the meter reading system, improved communication capabilities, and will allow CRW to achieve revenue more equivalent to the actual service area consumption. As such, a project was developed to upgrade the existing small meters throughout the system, and two bids were received by CRW in July 2023 for CRW's Advanced Metering Infrastructure Upgrade Project and a Notice of Intent to Award has been issued. This project will include the replacement of 19,000 water meters and transmitters. Replacement activities are planned to start in the fall of 2024 and be completed by the fall of 2026.

It is recommended that CRW conduct a compliance field audit of all 250 large meter accounts and all accounts with fire meters within the system with the primary purpose of ensuring compliance with CRW's Rules and Regulations. The Rules and Regulations require a properly working accurate and testable meter that cannot be bypassed without notification.

CRW meters the finished water entering the distribution system to determine peak flows and maximum day peak flows. Most of the customer meters in the system were replaced between 1999 and 2002.

A five-year comparison of the amount of NRW, as well as the number of water main breaks for the Water System is shown in **Table 4-3**. CRW reports that an increase in NRW in 2021 was due to PADEP requiring longer filter backwashes, which is then sent to the sanitary sewer.

**Table 4-3: Non-Revenue Water and Water Main Breaks**

| Year | Water Produced (MGD) | Non-Revenue Water (MGD) | Non-Revenue Water % | # of Water Main Breaks |
|---|---|---|---|---|
| 2018 | 6.72 | 1.49 | 22.2% | 19 |
| 2019 | 6.55 | 1.39 | 21.2% | 18 |
| 2020 | 6.54 | 1.72 | 26.2% | 18 |
| 2021 | 7.01 | 2.16 | 30.8% | 17 |
| 2022 | 7.38 | 2.24 | 29.7% | 22 |
| **Average** | **6.84** | **1.80** | **26.02%** | **19** |

Sources: 2022 Water Loss Audit Report for Finished Water and 2022 Main Break Water Loss Report

The amount of NRW includes authorized usage attributable to fires, line flushing, street cleaning, lab testing, etc., as well as NRW attributable to a number of factors such as meter inaccuracy, finished water reservoir leaks, water main leaks, private service connection leaks, and potential theft or unmetered connections.

CRW implemented a valve exercising program and has acquired equipment to exercise valves. This program will help CRW satisfy AWWA G200 Paragraph 4.2.5. Currently, two staff members, working four days per week work to exercise the valves in the system. Since this program started, CRW has exercised 200 valves in 2016, 397 valves in 2017, 401 in 2018, 103 valves in 2019, 428 valves in 2020, 173 valves in 2021, and 150 in 2022 totaling 1,852 valves of the approximately 5,368 valves in the system. CRW reports valves replaced, valves exercised, and valves repaired on Exhibit I, Distribution System Activities, in its Water Division Monthly Report. Approximately 90 percent of the valves in the system are thought to be operational.

CRW attempts to test all hydrants annually. Hydrants tested, replaced, and repaired are shown in Exhibit I, Distribution System Activities, in the Water Division Monthly Report. More than 99 percent of the hydrants in the system are thought to be operational. In 2022, 7 damaged hydrants were returned to normal operating condition by either repair or replacement.

CRW ensures that only NSF / ANSI Standard 61 approved coating and linings are used throughout its distribution system whenever new material is installed. However, much of the system predates the standard. Many service connections still have lead goosenecks where they connect to the mains. CRW has completed the Lead Assessment (incorporating their water service line index cards into their GIS) to allow for reporting and analysis of materials and assumptions based on dates and locations. The lead gooseneck replacement consists of CRW's internal policy to remove them when they are excavated for any reason regardless of if they are private or not, that includes a long-term plan of removing them with new main installations, which CRW is actively doing. CRW is actively working on establishing a lead inventory within its service lines to meet the requirements of PADEP. Small and large meters were tested according to the AWWA Manual M6 and replacement protocols for no lead brass are being followed.

The distribution system is capable of delivering the maximum day demand and satisfying fire flow requirements based on information obtained from records and interviews. However, no hydraulic model

results or reports were reviewed. CRW does record information related to main breaks including location, pipe material, diameter, type of break, and soil type. Most breaks are reported to be random except for one particular neighborhood that has aggressive soils. CRW does not have an external corrosion monitoring plan.

CRW reviews construction projects for potential impacts on its Water System. It has records for projects completed since the 1990s but not for earlier periods.

CRW's distribution system management program appears to be consistent with Section 4.2 of AWWA Standard G200 - Distribution Systems Operation and Management, based upon a limited review of documentation and an interview with CRW staff on July 28, 2023.

#### *4.2.6.3 Facility Operation and Maintenance*

CRW has been inspecting storage reservoirs on a five to eight-year cycle. CRW maintains the treated water in its finished water storage reservoirs at levels high enough to avoid low pressure complaints from customers. The reservoirs draw down and refill approximately 10.0 percent on a daily basis. This is relatively low turnover, but it is mitigated by the excellent quality of the water being delivered. In 2018 CRW depth tested the chlorine residual of both reservoirs during the year and the results showed that the chlorine residual was consistent at all water levels tested, which indicated that there was no significant degradation of water quality within the reservoirs. Furthermore, CRW is capable of increasing the turnover rate of the reservoirs if it suspects there may be degradation of water quality in the reservoirs. CRW did not depth test the chlorine residual in 2022.

CRW maintains a standard operating procedures document binder where all written standard operating procedures are compiled in one location. It has written operating procedures for the Susquehanna River Pump Station but not for its other pumping stations. Its SCADA system records operational conditions. It has written maintenance procedures for all three of its pumping stations. CRW has poor records as to the history of its distribution system pipelines. The average age of the distribution system is unknown as records regarding the installation dates of pipes are not available for about 40 percent of the distribution system. Where records are available, they indicate an aged system, with over 90 percent of the records showing an installation date prior to the 1960s, and almost half of those installations occurring over 100 years ago. A nominal replacement rate of 12,500 linear feet per year (~1% of the system) might be justified based on the age and size of the system. In July 2020 CRW completed a Water Transmission and Distribution System Asset Management Plan that will be used to inform future water main and water meter rehabilitation and replacement strategies. CRW will continue to invest in annual distribution system assessments while developing a long-term strategic approach for the distribution system.

CRW's distribution system operation and maintenance program appears to be consistent with Section 4.3 of AWWA Standard G200 - Distribution Systems Operation and Management, based upon a limited review of documentation and an interview with the Water Operations Supervisor on August 18, 2022

#### *4.2.6.4 Documentation*

CRW continues to update and expand its GIS system including integration with its City Works asset management program. CRW's plan is consistent with Section 5.1 "Documentation required" of AWWA Standard G200. It is recommended that CRW continue to expand this program.

# 5.0 CAPITAL IMPROVEMENT PLAN

## 5.1 Overview

CRW prepares a CIP that identifies the major planned projects and initiatives for the Water System. The CIP includes projects that are required to meet future regulations, replace aging infrastructure, enhance or expand services to customers, provide resiliency and redundancy, and increase cost-effectiveness and efficiency. While certain projects are required by regulations or needed to maintain proper operations others are discretionary in that the project is being undertaken to meet CRW's established goals but are not necessarily critical to the continued operation of the Water System. As such, the schedule for implementation of discretionary projects is often subject to change.

A review of CRW's long-term CIP, its past accomplishments, and the current observed condition of key assets was completed to assess the overall condition of the Water System and to identify potential capital improvements that should be considered for implementation by CRW in FY 2024. The following presents a summary of the findings of our review.

## 5.2 CRW Updated Capital Improvement Pan

A summary of the recommended CIP for CRW for the period FY 2024 through FY2032 that reflects the capital improvements that were identified and recommended based on the document reviews, visual inspections, and discussions with CRW as part of this report, are shown in **Table 5-1**

## 5.3 Discussion

CRW's capital plan is in general alignment with Gannett Fleming's observed requirements for the Water System. CRW generally has a good understanding of capital project needs and should prioritize projects based on urgency and affordability. CRW may proceed to reschedule and reprioritize various projects to balance the capital needs over the next several years. It is recommended that CRW update its cost estimates and capital funding plans for these projects as additional information becomes available.

**Table 5-1: Capital Improvement Plan**

| Description | FY 2024 | FY 2025 | FY 2026 | FY 2027 | FY 2028 | FY 2029 | FY 2030 | FY 2031 | FY 2032 |
|---|---|---|---|---|---|---|---|---|---|
| Mountain Line Repairs | $ 82,500 | $ 82,500 | $ 82,500 | $ 110,000 | $ 110,000 | $ 110,000 | $ 110,000 | $ 110,000 | $ 110,000 |
| DeHart Spillway Improvements Construction & Engineering | $ 70,000 | $ 10,697,743 | $ 13,248,000 | $ - | $ - | $ - | $ - | $ - | $ - |
| Solar Installation Project | $ 2,000,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| DeHart Actuators (Control Room & Intake Tower) | $ - | $ 88,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Unlimited Backwash Connection | $ - | $ 150,000 | $ 120,000 | $ - | $ - | $ - | $ - | $ - | $ - |
| Dehumidifier Replacement | $ - | $ - | $ - | $ 150,000 | $ - | $ - | $ - | $ - | $ - |
| Recoat Epoxy of the Basin Sedimentation Walls | $ 75,000 | $ 75,000 | $ 80,000 | $ 80,000 | $ - | $ - | $ - | $ - | $ - |
| Water Small Meter Replacements | $ 10,000 | $ 10,000 | $ 10,000 | $ 10,000 | $ 10,000 | $ 10,000 | $ 10,000 | $ 10,000 | $ 10,000 |
| Water Distribution MXU Replacements | $ 5,000 | $ 5,000 | $ 5,000 | $ 5,000 | $ 5,000 | $ 5,000 | $ 5,000 | $ 5,000 | $ 5,000 |
| Cameron Street Water Main Construction & Engineering | $ 1,695,500 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Water Main Assessment | $ 100,000 | $ 150,000 | $ 150,000 | $ 150,000 | $ 150,000 | $ 150,000 | $ 150,000 | $ 150,000 | $ 150,000 |
| Water Main Replacement | $ 2,784,863 | $ 2,868,409 | $ 2,954,461 | $ 3,043,095 | $ 3,134,388 | $ 3,228,419 | $ 3,325,272 | $ 3,425,030 | $ 3,527,781 |
| AMR/AMI Meter | $ 2,813,800 | $ 2,813,800 | $ 1,406,900 | $ - | $ - | $ - | $ - | $ - | $ - |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Network Conversion | | | | | | | | | |
| Large Water Meter Replacement | $ 30,900 | $ 31,827 | $ 32,782 | $ 33,765 | $ 34,778 | $ 35,822 | $ 36,896 | $ 38,003 | $ 39,143 |
| PennDOT I-83 Expansion DW Impacts | $ 250,000 | $ 70,000 | $ 3,762,885 | $ 50,000 | $ 50,000 | $ 1,050,000 | $ 50,000 | $ 50,000 | $ 1,050,000 |
| Street Restoration | $ 323,575 | $ 333,282 | $ 343,280 | $ 353,579 | $ 364,186 | $ 375,112 | $ 386,365 | $ 397,956 | $ 409,894 |
| Fleet Renewal | $ 448,000 | $ 215,000 | $ 259,000 | $ 676,500 | $ 705,000 | $ 410,014 | $ 383,407 | $ 550,981 | $ 264,423 |
| Gate House Frequency Drive Split | $ 100,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Clearwell/Upper and Lower Reservoir | $ - | $ - | $ - | $ - | $ 75,000 | $ - | $ - | $ - | $ - |
| WSC Laptops | $ 8,240 | $ 8,652 | $ 9,085 | $ - | $ 10,000 | $ 10,000 | $ - | $ - | $ - |
| Water Mains - CRW Upgrades | $ 30,900 | $ 31,827 | $ 32,782 | $ 33,765 | $ 34,778 | $ 35,822 | $ 36,896 | $ 38,003 | $ 39,143 |
| Plant Valve Replacements | $ 25,000 | $ 25,000 | $ 25,000 | $ 30,000 | $ 30,000 | $ 30,000 | $ - | $ - | $ - |
| Other Plant Upgrades - Placeholder | $ - | $ 200,000 | $ 200,000 | $ 200,000 | $ 300,000 | $ 300,000 | $ 400,000 | $ 400,000 | $ 400,000 |
| PRV Testing and Servicing | $ - | $ 9,000 | $ 10,000 | $ 11,000 | $ 12,000 | $ 13,000 | $ - | $ - | $ - |
| **Total** | **$10,853,278** | **$17,865,040** | **$22,731,675** | **$4,936,704** | **$5,025,130** | **$5,763,189** | **$4,893,836** | **$5,174,973** | **$6,005,384** |

[1] Project costs are presented in 2023 dollars

# 6.0 OPERATIONS AND MAINTENANCE EXPENSES REVIEW

## 6.1 Overview

The Trust Indenture (Section 7.12) requires CRW to adopt a Water System budget each year sufficient to meet all of CRW's projected financial obligations for the upcoming fiscal year. CRW typically adopts a finalized budget in November, two months prior to the start of the new fiscal year. CRW utilizes the capital plan and O&M recommendations in this CEAR to assist in establishing the budget. However, it should be noted that this CEAR only serves to provide advice and recommendations regarding capital additions and the amount of funds that should be expended to meet incremental O&M expenses.

## 6.2 Historical Water System Expenses

A summary of CRW's historical actual O&M expenses for FY 2021 and FY 2022 and the budgeted O&M expenses for FY 2023 are shown in **Table 6-1**. These expenses were reviewed and determined to be in general alignment with the overall O&M needs of the Water System.

**Table 6-1: Historical Water System O&M Expenses**

| | Historical | | Budget |
|---|---|---|---|
| **Description** | **FY 2021** | **FY 2022** | **FY 2023** |
| **O&M Expenses:** | | | |
| Salaries and Wages | $ 2,334,061 | $ 2,480,149 | $ 2,585,740 |
| Benefits and Taxes | $ 858,656 | $ 1,079,231 | $ 1,120,186 |
| Contracted and Professional Services | $ 366,442 | $ 649,100 | $ 699,250 |
| Repairs, Maintenance, and Supplies | $ 638,518 | $ 941,243 | $ 701,506 |
| Electricity | $ 197,123 | $ 180,000 | $ 230,000 |
| Chemicals | $ 324,913 | $ 397,000 | $ 468,000 |
| Sewerage | $ 532,938 | $ 437,000 | $ 570,000 |
| Insurance | $ 346,743 | $ 403,573 | $ 429,999 |
| Administrative Fee | $ 2,581,623 | $ 3,041,004 | $ 3,309,050 |
| Other Operating Expenses | $ 311,658 | $ 415,417 | $ 390,000 |
| **Total Annual O&M Expenses** | **$ 8,492,675** | **$ 10,023,717** | **$ 10,503,731** |

Source: Historical actual expenses in FY21 and FY22 and budgeted expenses in FY23 provided by CRW.

## 6.3 Additional Operations, Maintenance, and Repair Costs

Several recommendations regarding the addition of O&M expenses in FY 2024 for the proper maintenance, repair, and operation of the Water System should be considered for implementation by CRW, as discussed in Section 4 of this report. The estimated costs associated with these recommended items are shown in **Table 6-2**

**Table 6-2: Summary of Additional O&M Costs**

| Description | FY 2024 | FY 2025 | FY 2026 | FY 2027 | FY 2028 |
|---|---|---|---|---|---|
| DeHart Intake Windows | $2,100 | - | - | - | - |
| Union Station Pumping Station Monitor and Repaint Ceiling of Building | $7,800 | - | - | - | - |
| Lower Reservoirs – Pressure Wash, Inspect, and Repair Deficiencies from Inspections | $10,400 | - | - | - | - |
| Backflow Prevention Consistent with PADEP | $5,300 | $5300 | $5,300 | $5,300 | $5,300 |
| **Total** | **$25,600** | **$5,300** | **$5,300** | **$5,300** | **$5,300** |

Note: All amounts shown in Table 6-2 are in 2023 dollars.

## 7.0 CONCLUSIONS

Set forth below are the principal conclusions which Gannett Fleming has reached regarding our review of the Water System:

1. The Water System is generally being managed in a professional and prudent manner, with an appropriate regard for the level of service afforded to its customers. Based on our review of the data and limited visual inspection, the Water System is generally in good physical and operating condition. However, certain components are aged or worn and will require capital investment within the next five years.

2. The Water System has consistently produced high-quality water and zero non-compliant quarters in 2022. The CRW Drinking Water Department received a Notice of Violation in February. This violation was the result of an old calendar being utilized and Distribution site 703 was sampled in place of site 707. During the height of the COVID-19 pandemic, site 703 was being utilized in place of site 707. CRW switched back to the original sampling plan during the 2nd quarter of 2021. This was not notated on the posted monitoring calendar.

3. CRW's water supply and treatment capacity is sufficient to meet the current and near-term projected needs of the service area.

4. CRW's capital plan is in general alignment with Gannett Fleming's observed requirements for the Water System. CRW has a good understanding of additional capital projects needed. The lack of historical records creates challenges for the exception of the prioritization of specific water distribution line replacements, and CRW should endeavor to refine the list of projects based on ongoing engineering analysis.

5. CRW is working diligently to maintain the condition of the Water System. The Water System is generally being maintained and operated in accordance with generally accepted utility standards and overall the Water System is in good repair and operating condition.

6. It is recommended that CRW prepare for the Lead and Copper Rule Revisions to take effect in October 2024 and review the PADEP service line guidance material. The revisions will have impacts to CRW, ranging from increased sampling to proactive public education and lead service line replacement. PADEP has released proposed MCLs for PFOA and PFOS in drinking water; it is recommended that CRW track activity for finalization of State level drinking water PFAS regulations and closely follow Congress's actions for finalization of designating PFAS as a hazardous substance under CERCLA. CRW is actively working on establishing a lead inventory within its service lines.

7. Based on the available information, Gannett Fleming recommends CRW implement additional O&M efforts as described in this report, including the following:

    - At the DeHart Dam, replace the broken windows on the intake house.
    - At the Union Station Pump Station, continue to monitor the paint peeling along the ceiling and repaint.
    - At the Lower Reservoirs, pressure wash the exteriors and perform an inspection along with any required repairs resulting from inspections.

- Implement a backflow prevention program.

8. It is recommended that a CRW compliance field audit of all 250 large meter accounts and all accounts with fire meters is conducted within the system with the primary purpose of ensuring compliance with CRW's Rules and Regulations.

This CEAR summarizes the work completed up to the date of the issuance of this CEAR. Changed conditions occurring or becoming known after such a date could affect the material presented to the extent of such changes. Gannett Fleming has no responsibility for updating this CEAR for changes that occur after the date of this report.

In preparation for this CEAR, Gannett Fleming has relied upon financial, engineering, and operational data, and assumptions prepared by and/or provided by CRW. In addition, information and projections have been provided by other entities working on behalf of CRW. We believe such sources are reliable and the information obtained to be appropriate for the review undertaken and the conclusions reached in this CEAR. To the best of our knowledge, information, and belief, the information does not omit material facts necessary to make the statements herein. However, Gannett Fleming has not independently verified the accuracy of the information provided by CRW and others. To the extent that the information is not accurate, the findings and recommendations contained in this CEAR may vary and are subject to change.

Gannett Fleming devoted effort in making such opinions consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under the same or similar circumstances and the time and budget available for its work in its efforts to endeavor to provide such opinions. The opinions are based on information provided by and consultations with CRW. No responsibility was assumed for inaccuracies in reporting by CRW or any third-party data source used in preparing such opinions. Gannett Fleming's opinions represent its professional judgment. Gannett Fleming Inc. does not make any warranty, expressed or implied, with respect to such opinions.