Castle Rock Water Commission
Agenda - Final-Amended

Todd Warnke, Chair
Bill Leung, Vice Chair
Angie Brown
Kathryn Gienger
David Hammelman
Kevin McHugh
Tony Rathbun

Wednesday, April 26, 2023 **6:00 PM** **Castle Rock Water**
175 Kellogg Ct., Bldg. 171
Castle Rock, CO 80109

This meeting is open to the public and will be held in a hybrid format in accordance with Town Council Electronic Participation, Connected, and Hybrid Meeting Policy. The in-person meeting will be held at 175 Kellogg Ct. Bldg. 171 Castle Rock CO 80104 or this meeting can be accessed online at: https://crgov.webex.com/crgov/j.php?MTID=m74503bfcb0954f286113fd3a996bf862 the Meeting password: Gf3MUJrEd86 (43368573 from video systems) or phone in by calling (720) 650-7664, meeting code #24964978966#. One or more Council members may also attend this meeting, during which the items listed herein will be discussed.

6:00 pm CALL TO ORDER / ROLL CALL

COUNCIL UPDATE

COMMISSION COMMENTS

ADMINISTRATIVE BUSINESS

1. WC 2023-039 Approval of the March 28, 2023 Meeting Minutes

   Attachments: Attachment A: March Meeting Minutes.pdf

2. WC 2023-040 Update on Water Commission Interviews

ACTION ITEMS (HIGH PRIORITY / TIME CRITICAL)

3. WC 2023-041 Resolution Approving an Intergovernmental Agreement with Douglas County for the Highway 85 Wastewater Collection and Treatment System [Located along the Highway 85 Corridor North of E. Happy Canyon Rd to W Titan Rd in northern Douglas County]
   Town Council Agenda Date: May 2, 2023

   Attachments: Exhibit 1: Agreement.pdf
   Attachment B: Service Area.pdf
   Attachment C: Alternate Option #3.pdf
   Attachment D DWSD Castle Rock ARPA -04.18.2023.pdf

4. WC 2023-042 Resolution Approving the 2023 Water Master Plan [Entire Castle Rock Water Service Area]

Attachments: Attachment A: Resolution.docx

Exhibit 1: Water Master Plan

5. WC 2023-043 Resolution Approving the Name Dedication of the Blue Zone Pump Station to Anderson Blue Zone Pump Station [1760 Meadows Blvd.]

Attachments: Attachment B: Resolution 2013-56 Adopting Amended Naming Policy.pdf

Attachment C: Major Element Naming Rights form.docx

Attachment D: Location Map.pdf

6. WC 2023-044 Resolution Approving Changes to the Castle Rock Water Grease Interceptor Assistance Program [Town-wide program]

7. WC 2023-045 Resolution Approving the 2023 Town of Castle Rock/Sublette Water Lease Agreement [Rothe/Sublette Recharge Project, Weld County, CO]

Attachments: Exhibit 1: Agreement.pdf

8. WC 2023-046 Resolution Approving the 2023 Town of Castle Rock/Colorado Parks & Wildlife Spot Water Lease Agreement [Chatfield Reservoir, Douglas County]

Attachments: Exhibit 1: Agreement.pdf

DIRECTOR FOLLOW-UP AND INFORMATIONAL / UPDATE ITEMS

9. WC 2023-047 Update on Customer Characteristics

10. WC 2023-048 Informational Item Pertaining to the Proposed Senate Bill SB23-267 Concerning Protecting Water Quality in Chatfield Reservoir and the Watershed

Attachments: Attachment A: TC Packet SB23-267.pdf

11. **WC 2023-050** Update on Drought Conditions

12. WC 2023-049 Upcoming Town Council Items

COMMISSIONER MEETING COMMENTS

Town of Castle Rock

Agenda Memorandum

Agenda Date: 4/26/2023

Item #: 1. **File #:** WC 2023-039

To: Members of the Castle Rock Water Commission

From: Mark Marlowe, P.E., Director of Castle Rock Water

Approval of the March 22, 2023 Meeting Minutes
Town Council Agenda Date: NA

Executive Summary

Attached are the meeting minutes for the March 22, 2023 Water Commission Board Meeting.

Proposed Motion

"I move to approve the Minutes as presented"

Attachments

Attachment A: March 22, 2023 Meeting Minutes

Castle Rock Water Commission
Meeting Minutes - Draft

Todd Warnke, Chair
Bill Leung, Vice Chair
Angie Brown
Kathryn Gienger
David Hammelman
Kevin McHugh
Tony Rathbun

Wednesday, March 22, 2023 **6:00 PM** **Castle Rock Water**
175 Kellogg Ct., Bldg. 171
Castle Rock, CO 80109

This meeting is open to the public and will be held in a hybrid format in accordance with Town Council Electronic Participation, Connected, and Hybrid Meeting Policy. The in-person meeting will be held at 175 Kellogg Ct. Bldg. 171 Castle Rock CO 80104 or this meeting can be accessed online at: https://crgov.webex.com/crgov/j.php?MTID=m92cb42571097d1f8b206e0b9132d5aa0 the Meeting password: Mar22WCMtg (62722926 from video systems) or phone in by calling (720) 650-7664, meeting code #24978923628#. One or more Council members may also attend this meeting, during which the items listed herein will be discussed.

CALL TO ORDER / ROLL CALL

Present 6 - Chair Todd Warnke, Vice Chair Bill Leung, Angie Brown, Kathryn Gienger, David Hammelman, and Kevin McHugh

Not Present 1 - Tony Rathbun

Attendance 9 - Jason Gray, Mark Marlowe, Nichol Bussey , Roy Gallea, David Van Dellen, Paul Rementer, Walt Schwarz, Matt Hayes, and Shantanu Tiwari

COUNCIL UPDATE

Time was allowed for Mayor Gray to share a council update.

COMMISSION COMMENTS

Time was allowed for Commissioner Comments.

ADMINISTRATIVE BUSINESS

WC 2023-028

Approval of the February 28, 2023 Meeting Minutes
Town Council Agenda Date: NA

Angie Brown shared two corrections to the meeting minutes, Rick Schultz was left off the attendance list and the vote on the meeting minute's item reflected an incorrect vote. The vote should have been 6-0-1 (Angie Brown abstained)

It was moved by Kathryn Gienger and seconded by David Hammelman to approve the meeting minutes with the added corrections The motion passed 6-0

Yes: 6 - Chair Warnke, Vice Chair Leung, Brown, Gienger, Hammelman, and McHugh

Not Present: 1 - Rathbun

WC 2023-029

Water Commission Appreciation Event
Town Council Agenda Date: NA

Ms. Woodrick shared that the Water Commission Appreciation Event will be on Friday, April 21, 2023 at the Mill House. Cocktails will be served at 5:30 pm with dinner being served at 6:30 pm. Invitations will be sent via email in the next day or two.

Mr. Marlowe also let board members know that the Board and Commission application process will start in April. At this time, the Water Commission Board will have two open positions and two positions that are up for reappointment. Applications will be accepted from April 1st - 24th. Interviews will be held on May 9th. The new board members will begin their terms on June 1st.

ACTION ITEMS (HIGH PRIORITY / TIME CRITICAL)

WC 2023-030

A Resolution Approving a Construction Contract between the Town of Castle Rock and Global Underground Corporation for the East Plum Creek Open Space Well Facility *[Open space north of Plum Creek Water Purification Facility]*
Town Council Agenda Date: April 4, 2023

Mr. Hayes explained that this project is to build the well facility for the wells that are currently being drilled just north of the Plum Creek Water Purification Facility (PCWPF). The anticipated production of these wells is 0.7-0.9 million gallons per day (MGD). The wells will be designed for Aquifer Storage and Recovery as well. Castle Rock Water (CRW) will be able to send this water to the Meadows Treatment Facility or to PCWPF. This project will help CRW meet customer water demands during peak season use.

CRW received four bids. Global Underground was selected as the contractor. The proposed cost of the project is $2,375,650.01 with a 10% contingency for a total estimated authorization of $2,613,215.01. The project will begin in May of 2023 with an estimated completion of December 2023.

Commission Brown asked which aquifer would be used for the aquifer storage and recovery (ASR)? Mr. Hayes explained it would be the Arapahoe Basin.

Kevin McHugh moved to recommend to Town Council approval of the Resolution as presented. Bill Leung seconded the motion. Passed unanimously 6-0.

Yes: 6 - Chair Warnke, Vice Chair Leung, Brown, Gienger, Hammelman, and McHugh

Not Present: 1 - Rathbun

WC 2023-031

A Resolution Approving a Construction Contract between the Town of Castle Rock and RME Ltd., LLC dba Elite Surface Infrastructure for the Prestwick Water Rehab Project
[W. Prestwick Way]
Town Council Agenda Date: April 4, 2023

Mr. Hayes explained that this project is a rehabilitation project that is located in the southern part of the Plum Creek neighborhood. This pipe was laid in the 1980's and CRW has had to make several repairs of the pipe in recent years. This project will replace 2,241 feet of 8 inch main, 9 gate valves, 5 fire hydrants, as well as replace service lines between the main and curb stop and repair the road that will be disturbed by this project.

CRW received four bids. Elite Surface Infrastructure (ESI) was selected as the contractor. The proposed cost of the project is $1,095,135 plus a 10% contingency for a total estimated budget of $1,204,648. The project is scheduled to begin in May 2023 with a planned completion date of September 2023.

Commissioner Brown asked what the material of the pipe currently is? Mr. Hayes explained that it is ductile iron pipe that was not wrapped to protect it from corrosion.

Commissioner Hammelman asked what the impact will be on the residents? Mr. Hayes explained that the disruption of water to homes should be minimal. The water will only need to be disrupted when the connections from the main to the curb stop are made.

Commissioner McHugh asked what happens if the line from the curb stop to the home is not in good condition? Mr. Hayes explained that the customer would be responsible for any repairs to that portion of the service line. Commissioner Warnke asked what the life span of a pipe should be, is this a normal timeframe, will CR residents being seeing more replacement projects in the future? Staff answered, 40 to 50 years so yes, and yes residents will see more of these projects in the future.

Bill Leung moved to recommend to Town Council approval of the Resolution as presented. David Hammelman seconded the motion. Passed unanimously 6-0.

Yes: 6 - Chair Warnke, Vice Chair Leung, Brown, Gienger, Hammelman, and McHugh

Not Present: 1 - Rathbun

WC 2023-032

A Resolution Approving a Construction Contract between the Town of Castle Rock and XXXX to provide construction services for Castle Rock Reservoir No. 2 (CRR2) and Castle Rock Reservoir No. 1 (CRR1) *[Sedalia, CO]*
Town Council Agenda Date: April 4, 2023

Mr. Tiwari shared that CRW has an existing reservoir out in the Sedalia area. The current reservoir holds 240 acre feet (AF). The purpose of this project is to build a second reservoir that will hold 790 AF. Once the second reservoir is built the first reservoir will be expanded to hold 550 AF.

CRW received five bids for this project. HEI was selected as the contractor for this project. The proposed cost for this project is $26,490,159.04 with a 10% contingency for a total estimated authorization of $29,139,174.94.

Commissioner Warnke asked why there was such a large difference between HEI's bid and the next lowest bid? Is there any concern that something was missed? Staff explained that HEI built the first reservoir so they were very familiar with the site. They are also a local contractor with significant currently available equipment. Based on meetings with the design engineer and HEI, staff does not have any concerns at this point that something was missed.

Commissioner Gienger asked how the other reservoirs they have done compare to this project? Mr. Tiwari stated that most are the size of reservoir 1 or smaller.

Kevin McHugh moved to recommend to Town Council approval of the Resolution as presented. Angie Brown seconded the motion. Passed unanimously 6-0.

Yes: 6 - Chair Warnke, Vice Chair Leung, Brown, Gienger, Hammelman, and McHugh

Not Present: 1 - Rathbun

WC 2023-033

A Resolution Waiving Formal Written Bidding Requirements on the Basis of a Sole Source and Approving a Professional Services Agreement to provide construction support services for the Castle Rock Reservoir No. 2 (CRR2) and Castle Rock Reservoir No. 1 (CRR1) *[5219 Rio Grande Ave, Sedalia, CO 80135]*
Town Council Agenda Date: April 4, 2023

Mr. Tiwari explained that W.W. Wheeler has been the design engineer for the Castle Rock Reservoir No. 1 & No. 2 project. This agreement is to have them continue as support through the construction project. Their services will include construction supervision, materials testing, review of submittals, handling of requests for information (RFI's) and change orders.

The proposed cost for this service is $2,111,200 with a 5% contingency for a total estimated authorization of $2,216,760.

Angie Brown moved to recommend to Town Council approval of the Resolution as presented. Kathryn Gienger seconded the motion. Passed unanimously 6-0.

Yes: 6 - Chair Warnke, Vice Chair Leung, Brown, Gienger, Hammelman, and McHugh

Not Present: 1 - Rathbun

WC 2023-034

A Resolution Approving a Professional Services Agreement between the Town of Castle Rock and Burns & McDonnell for the Pinery Water Pipeline Project *[Along Castle Oaks Drive in the northwest part of the Town]*
Town Council Agenda Date: April 4, 2023

Mr. Tiwari explained that this item is for the design of a pipeline that will move water from the Pinery into CRW's supply. The Town will receive between 0.25 and 1.0 MGD of water from the Pinery, that is originally from the Cherry Creek Project Water Authority (CCPWA).

CRW received two bids for this project. Burns & McDonnell was selected as the design engineer. The proposed cost for the design phase is $805,043, plus a 10% contingency for a total estimated authorization of $885,547.

Commissioner Brown asked if there would be an impact to the residents in that area? Mr. Tiwari explained that most of the work will be done on Town property. The only other area is land that is in a trust and staff will work with them.

Commissioner Leung asked why the water from the Pinery is different than the water in Castle Rocks system? Staff explained the differences in aesthetic quality and the resulting impacts that can have.

Bill Leung moved to recommend to Town Council approval of the Resolution as presented. Kevin McHugh seconded the motion. Passed unanimously 5-0-1 (Kathryn Gienger abstained).

Yes: 5 - Chair Warnke, Vice Chair Leung, Brown, Hammelman, and McHugh

Not Present: 1 - Rathbun

Abstain: 1 - Gienger

WC 2023-035

A Resolution Approving a Services Agreement between the Town of Castle Rock and Burns & McConnell Engineering to complete the Design Phase Engineering Services for

PCWPF Expansion Project *[1929 Liggett Rd. Castle Rock, CO 80109]* ***DRAFT***
Town Council Agenda Date: April 18, 2023

Mr. Schwarz shared that CRW is ready to begin the next phase of the Plum Creek Water Purification Facility Expansion. This item is to design the next expansion which will increase the facility capacity from 6 MGD to 12 MGD. The additions will include an additional pretreatment train, raw water feed tanks, additional granular activated carbon (GAC) filtration, ozone treatment and improved solids handling. A new larger generator will also be added.

This agreement will also stipulate that the contractor will be selected and added to the team once the design has been 30% completed. This will allow the contractor to lend their expertise in what will and will not work as well.

The RFP was issued to five engineering firms and CRW receive one proposal. Burns & McDonnell was selected as the design engineer. The proposed cost of the project is $2,388,880 with a 5% contingency for a total estimated cost of $2,508,324. The design schedule is April 2023 to May 2024 with the RFP for the contractor to be issued in Fall 2023. The estimated completion of the project will be the end of 2026.
Commissioner Gienger asked if all of the facilities have generators? Mr. Schwarz explained that yes they all do with the exception of Founders Water Treatment Plant.

Commissioner McHugh asked if this will help give CRW some breathing room prior to Dawson Trails coming on-line? Staff answered that this will help provide a wider margin of supply especially during irrigation season.

Kevin McHugh moved to recommend to Town Council approval of the Resolution as presented. Angie Brown seconded the motion. Passed unanimously 6-0

Yes: 6 - Chair Warnke, Vice Chair Leung, Brown, Gienger, Hammelman, and McHugh

Not Present: 1 - Rathbun

DIRECTOR FOLLOW-UP AND INFORMATIONAL / UPDATE ITEMS

WC 2023-036

2022-2023 Budget Recap
Town Council Agenda Date: NA

Mr. Rementer shared a presentation on multiple topics related to finances. He shared that building permits are down which will impact CIP projects planned for 2023 and beyond. He also shared that staff is looking at energy costs and will be working on ways to be more efficient.

Ms. Bussey was happy to share an update on the progress for the new AMI project, how the Financial Hardship program is going and how many

customers have signed up for the new on-line bill pay portal (Silverblaze).

WC 2023-037

A Resolution Approving a Variance Pursuant to Chapter 9.16.010.E of the Castle Rock Municipal Code for Nighttime Construction Activities Related to the Tank 18 Blue Zone Main Project *[Located at the intersection of Castle Oaks Drive and Pleasant View Drive]*
Town Council Agenda Date: March 21, 2023

Mr. Marlowe explained that this item was approved at the March 21st Town Council meeting and is just an informational update.

WC 2023-038

Upcoming Town Council Items
Town Council Agenda Date: NA

This is a standing item that will be used to share information about projects that are being worked on at the time of the meeting but that staff doesn't have information ready yet.

Mr. Marlowe shared that April is Water Conservation Month and that Town Council will be making a Proclamation at the April 4th meeting.

COMMISSIONER MEETING COMMENTS

Time was allowed for Commissioner Comments.

Town of Castle Rock

Agenda Memorandum

Agenda Date: 4/26/2023

Item #: 2. **File #:** WC 2023-040

To: Members of the Castle Rock Water Commission

From: Mark Marlowe, P.E., Director of Castle Rock Water

Update on Water Commission Interviews
Town Council Agenda Date: NA

Executive Summary

The Castle Rock Water Commission currently has four open positions for the 2023-2024 year.

Application deadline was April 24, 2023. CRW received 13 applications as of Thursday, April 20.

Interviews for these positions will be held on May 9, 2023 from 5 pm to 9 pm at Town Hall. The interview panel consists of Mayor Jason Gray, WC Chair Todd Warnke, and Director Mark Marlowe.

Final recommendations will be presented to Town Council on May 16, 2023.

New board members will take effect on June 1, 2023.

Town of Castle Rock

Agenda Memorandum

Agenda Date: 4/26/2023

Item #: 3. **File #:** WC 2023-041

To: Members of the Castle Rock Water Commission

From: Mark Marlowe, P.E., Director of Castle Rock Water
Scott Tait, E.I, Water Resources Project Manager

Resolution Approving an Intergovernmental Agreement with Douglas County for the Highway 85 Wastewater Collection and Treatment System *[Located along the Highway 85 Corridor North of E. Happy Canyon Rd to W Titan Rd in northern Douglas County]*
Town Council Agenda Date: May 2, 2023

Executive Summary

Castle Rock Water (CRW) staff recommends Town Council approval of a Resolution (***Attachment A***) approving an Intergovernmental Agreement (IGA) with Douglas County for CRW to manage the design and construction of a wastewater collection and treatment system to be located along the Highway 85 corridor. Key terms of the IGA with Douglas County are as follows:

- Provides CRW with $26.8 Million in Douglas County American Rescue Plan Act funds to design and construct the system with funds needing to be spent by December 31, 2026;
- Allows CRW to charge a 1% project management fee for these services;
- Dedicates the constructed system assets in the corridor to CRW for long term operation, maintenance, repair and replacement;
- Makes CRW the retail and wholesale wastewater provider in the Service Area (see ***Attachment B***);
- Requires CRW to develop rates and fees for the Service Area;
- Allows CRW to charge a 10% extraterritorial surcharge for all aspects of this service; and
- Ensures that new development in the corridor beyond the first 200,000 gallons of wastewater can only occur if renewable water supplies are available.

The benefits of the IGA to Chatfield Reservoir, Douglas County, the corridor and CRW are as follows:

- Improves water quality in Chatfield Reservoir (drinking water source for CRW) by removing untreated or poorly treated wastewater sources in the corridor (e.g. Louviers);
- Allows all reusable water supplies used in the corridor to be captured for reuse by CRW and Dominion Water and Sanitation District (DWSD) with DWSD only taking those supplies where they are the supplier;
- Creates wastewater solutions for existing communities in the corridor (e.g. Louviers and Sedalia) and existing businesses (e.g. CORE a big employer in the region);

- Improves the economic viability and vitality of this key transportation corridor (good location for primary jobs) by ensuring that wastewater service is available;
- Provides opportunities for additional water quality and environmental projects along Plum Creek utilizing easements obtained from this project;
- Gives the opportunity for consolidation of some of the small underfunded water and sanitation districts into more sustainable systems like CRW; and
- Allows for collaboration on a trail system running from Castle Rock all the way to Chatfield Reservoir by co-locating the sewer system with trails on easements obtained in the corridor.

Additional benefits of the IGA to CRW include:

- Ensures that CRW has oversight of water and wastewater development in this critical CRW water resources corridor;
- Contributes to economies of scale for CRW's operations over the long term helping to spread our costs amongst a larger customer base;
- Gives CRW more financial resources from the extraterritorial surcharge to accomplish our core mission and vision; and
- Provides ARPA funding for a pump station that will pump reuse water back to CRW's reservoirs in Sedalia and help offset the cost of our Chatfield Pump Back system (at least a $2 to $4 million benefit for our long term water plan)

The Highway 85 corridor is adjacent to East Plum Creek and Plum Creek which discharges into Chatfield Reservoir. The majority of wastewater collection and treatment systems along the corridor consist of individual onsite septic tanks with leach fields that discharge to groundwater. The exception to this is that the community of Louviers has a gravity sewer collection system that treats its wastewater in a facultative pond and discharges effluent via land application. CRW will utilize $26.8 million in American Rescue Plan Act) (ARPA) funds provided through and by Douglas County to manage the project for the design and construction of infrastructure for the major wastewater components which include conveyance gravity sewers, force mains and lift stations and a wastewater treatment plant to serve the corridor. CRW will receive a 1% project management fee for its project management services for the project.

Notification and Outreach Efforts

CRW has worked closely with potential customers in the corridor including LSD, Sedalia, CORE and another new development in northern Douglas County.

Discussion

Alternative Selection

Castle Rock Water will evaluate the various alternatives for building a wastewater collection and treatment system for the Highway 85 corridor. This evaluation will be shared with Douglas County and the most favorable alternative will be selected based on cost, environmental benefits, constructability, permitting, technology feasibility, ease of implementation, differing operability, ease of schedule, regional partnerships and other factors for selecting the best alternative. There are three project alternatives listed in the IGA as follows:

- Alternative 1. All Force Main with two lift stations with discharge to Plum Creek Water Reclamation Authority (PCWRA).
- Alternative 2. Louviers Wastewater Treatment Plant with gravity sewers from Sedalia with discharge of treated effluent to Plum Creek and/or piping of wastewater to the Castle Rock reservoir system.
- Alternative 3. Chatfield Basin Water Reclamation Facility (CBWRF) with a lift station at Louviers and a force main from Louviers to a Sterling Ranch gravity sewer then on to the Titan Road lift station.

Alternative 3 is currently the preferred Alternative and as shown in ***Attachment C***, takes advantage of participation with additional utility stakeholders. Dominion Water & Sanitation District (DWSD) would be the other utility participant. A Term Sheet (***Attachment D***) with DWSD is the basis of a more definitive IGA to be worked out with DWSD with later submission to Town Council for approval.

For the Alternative 3 infrastructure, a wastewater treatment plant located on Caretaker Road off West Waterton Road and near the South Platte River would be built by CRW as part of the overall project, and owned and operated by DWSD. To convey Highway 85 corridor wastewater to the Caretaker Rd location it would flow through DWSD infrastructure of gravity sewers, force mains and lift stations from a future CRW owned and operated lift station in Louviers. Wastewater that would flow to the Louviers lift station would come from the Louviers community collection system and also eventually from the Sedalia area. Since the ARPA funds represent a finite amount of monies that must be spent by December 31, 2026, System Development Fees will provide funding for the sewer expansions to the south, north and east of Louviers. CRW will provide retail and/or wholesale wastewater service in the Service Area. CRW will reuse the wastewater collected and treated from the corridor via a pump station at the Dominion wastewater treatment plant site that will connect to CRW's future Chatfield Reservoir Pump Back Project that is presently in the Preliminary Engineering phase. The reuse water would be stored at the CRW reservoirs near Sedalia for later treatment to potable water quality levels at the Plum Creek Water Purification Facility.

<u>Project Management of Phase 1</u>
The project will be completed in two phases. The concept for Phase 1 will be to construct infrastructure to provide roughly 200,000 gallons per day of average daily collection and treatment capacity in the Highway 85 corridor. After the selection of the alternative and the engineering tasks required to select the infrastructure treatment site locations, lift station(s) and pumping station(s) and pipeline routes, Castle Rock Water will break the project down into phases as appropriate. For example, for Alternative 3, the project will be broken down into:

- Louviers Lift Station
- Louviers Force Main
- Chatfield Basin Water Reclamation Facility
- Titan Road Lift Station

Castle Rock Water will then manage all aspects of the acquisition of professional engineering and construction services for the permitting, design and construction of the infrastructure associated with the selected alternative for the Regional Wastewater Collection and Treatment Project. A work breakdown structure and Gantt style schedule will be developed with the various project components identified. An example high level schedule is provided below.

Castle Rock Water will evaluate the most appropriate project delivery methods for the various project components based on the rules of the ARPA funding, permitting, the schedule, technical aspects of the work, availability of qualified consultants and contractors, and availability of critical equipment (pumps, treatment process equipment, etc.).
RFPs for professional engineering services will be issued. Once selection is made with Douglas County's concurrence, design will begin. Castle Rock will work with Douglas County to set up the appropriate escrow accounts for each contract awarded as part of the project. As design progresses, Castle Rock will begin easement and property acquisition. Temporary easements will be obtained that are needed for the construction of the infrastructure. Easements will also be obtained for the multipurpose trail where the proposed location matches the wastewater collection piping routes. Also, as part of the design, permitting will be completed for each work phase. As designs for each phase are complete as appropriate depending on the delivery method used, construction bidding will be completed. Work will be awarded with Douglas County concurrence. Castle Rock Water will oversee construction for each phase using professional engineering services as appropriate to ensure we receive a good project.

In the initial phases of the project, Castle Rock will develop and write Requests for Proposals (RFP's) needed for acquiring the professional engineering services to accomplish the tasks of schematic design (30% engineering), the 60% engineering needed for drawings and most permits, 90% engineering for drawings, specifications and cost estimates, and 100% engineering needed for complete construction. Castle Rock will use our standard process for engineering and construction services including our contracts and documents for obtaining design and construction services. Each component will go through approval with our Council like we do for any project over $250,000. Each component will also be brought to Douglas County for approval.

Castle Rock is planning on constructing the infrastructure using alternative delivery methods as allowed based on the ARPA funding rules. For example, Castle Rock will consider the CMAR (Construction Manager at Risk) delivery method for some components of the project. The CMAR delivery method is designed for speed of construction implementation and transparency of costs in addition to communitive and excellent collaboration between internal and external stakeholders of the project. At the 30% engineering design level, construction contractors will be solicited to submit labor, materials, overhead and profit proposals for the project which Castle Rock will oversee and evaluate with input from the professional engineering services team. The CMAR contractor will provide a Guaranteed Maximum Price Construction Management (GMPCM) contract at that time and work towards developing a Final Guaranteed Maximum Price (FGMP) contract.

Provision of Wastewater Service
Once the project infrastructure is complete, Castle Rock Water will own, operate, maintain, repair and replace the collection system infrastructure in the Highway 85 corridor and the reuse water components of the system. The wastewater treatment plant (CBWRF) will be assigned to Dominion

to own, operate, maintain, repair and replace once construction is complete if Alternative 3 is selected.

Castle Rock Water will provide retail and/or wholesale wastewater service in the Service Area. In addition to operating and maintaining the system, this service will include an annual cost of service evaluation and setting of rates and fees, billing and customer service. Castle Rock will also consider providing retail water service where water supply is available and the customer would like to have that service as well as part of a more holistic retail service.

As the wastewater provider Castle Rock Water will also annually evaluate and set system development fees (SDFs) to be paid by customers connecting to the system, which fees will be different for existing development verses new development and redevelopment. For all potential customers, Castle Rock Water will determine necessary improvements, available capacity and SDFs and then provide a will serve letter if service can be provided.

Project Management of Phase 2
Castle Rock will utilize SDFs to build Phase 2 of the project in the future to allow service to be provided beyond the capacities created in Phase 1. SDF revenue will be put into a project fund. As funds accrue, Castle Rock will design, permit and construct additional infrastructure in the corridor. Ultimately, the concept will be to construct a full collection system from Titan Road Lift Station to just North of Plum Creek Water Reclamation Authority and approximately 1 million gallons per day of average daily flow treatment capacity. Past Phase 1 capacities, Castle Rock will also evaluate availability of renewable water supplies for new development and redevelopment. Confirmation of renewable water supplies will be an additional requirement in order to gain wastewater services.

Budget Impact

CRW will receive a 10% surcharge on all rates and fees and system development fees towards the operations and overhead cost of CRW.

Staff Recommendation

Staff recommends Town Council approval of this IGA with Douglas County for the Highway 85 Wastewater Collection and Treatment System.

Proposed Motion

“I move to recommend Town Council approval of the Resolution as introduced by title.”

Attachments

Attachment A:	Resolution (Not Attached)
Exhibit 1:	Agreement
Attachment B:	Service Area
Attachment C:	Alternate Option #3
Attachment D:	DWSD Term Sheet

INTERGOVERNMENTAL AGREEMENT BETWEEN THE TOWN OF CASTLE ROCK AND DOUGLAS COUNTY FOR THE HIGHWAY 85 WASTEWATER COLLECTION AND TREATMENT SYSTEM

THIS INTERGOVERNMENTAL AGREEMENT (the "Agreement") is made and entered into this _____ day of _____, 2023 (the "Effective Date"), by and between the Town of Castle Rock, a home rule municipal corporation, acting by and through the Town of Castle Rock Water Enterprise ("Castle Rock"), and the Board of County Commissioners of the County of Douglas ("Douglas County"), (each, individually, a "Party" and, collectively, the "Parties").

WITNESSETH:

WHEREAS, C.R.S. § 29-1-203 authorizes the Parties to cooperate and contract with one another regarding functions, services and facilities each is authorized to provide; and

WHEREAS, Castle Rock operates a wastewater collection system and owns wastewater treatment capacity in the Plum Creek Water Reclamation Authority ("PCWRA") treatment facility to provide retail wastewater service to its customers; and

WHEREAS, Douglas County desires to utilize American Rescue Plan Act funding to design and construct a wastewater collection and treatment system along the Highway 85 corridor (the "Highway 85 Wastewater Collection and Treatment System" or "System") in Douglas County, starting in the unincorporated Town of Louviers and extending as far south towards the PCWRA wastewater treatment facility as funding will allow; and

WHEREAS, Castle Rock has the experienced project engineering and management staff that are needed to help Douglas County construct the System; and

WHEREAS, Castle Rock also has the operational capacity and experience to own, operate, maintain, and, if necessary, replace the System, and/or manage the contracting for these services, for the benefit of the future customers of the System in unincorporated Douglas County; and

WHEREAS, Castle Rock is willing to make available at cost, plus an extraterritorial surcharge, wastewater treatment capacity it owns in the PCWRA treatment facility to serve customers of the System, but only if this proves to be the most cost-effective method of providing such service; and

WHEREAS, Castle Rock is willing to use its project engineering and management expertise to design and construct a System for Douglas County and to give Douglas County full authority to allocate capacity in the System to existing and future customers of the System; and

WHEREAS, Douglas County further desires to utilize American Rescue Plan Act funding to obtain easements to facilitate the construction, operation, and maintenance of the System along Plum Creek, which easements can exist in combination with existing and future trails, thereby expanding recreational amenities for Douglas County residents; and

WHEREAS, Castle Rock has the ability to acquire these easements on behalf of Douglas County; and

WHEREAS, Douglas County and Castle Rock believe the System will improve water quality in Plum Creek and Chatfield Reservoir, both of which are drinking water sources for Douglas County and Castle Rock, by eliminating failing wastewater lagoon systems and, eventually, septic systems; and

WHEREAS, Douglas County believes that the System will stimulate economic development and growth in the Highway 85 corridor; and

WHEREAS, based upon the foregoing reasons, the Parties find and determine that it is in the best interests of their respective customers and citizens to enter into this Agreement.

NOW, THEREFORE, the Parties, in and for the consideration of the performance of the mutual promises set forth herein, the receipt and adequacy of which is hereby acknowledged, for themselves and their successors, do hereby agree as follows:

1. DEFINITIONS.

The following terms, when capitalized, shall have the meanings indicated:

A. "Collection System" means that portion of the Project Infrastructure utilized for the collection and delivery of wastewater to the Collection System Treatment Facility, in the event that such Facility is designed and constructed as part of the Project.

B. "Collection System Development Fee" means the fee that Castle Rock will charge to those persons seeking to develop or redevelop property within the Service Area for the right to connect to the Highway 85 Wastewater Collection and Treatment System. Said fee shall be charged for the purpose of defraying all costs associated with the design and construction of the Collection System and any improvements thereto, and shall consist of: (i) the capital recovery fee, which shall be calculated based on the Final Infrastructure Costs for the Collection System, (ii) the capital improvement fee, which shall be calculated based on the costs of increasing the capacity of the Collection System as may be necessary to serve new development or redevelopment in the Service Area, (iii) the Extraterritorial Surcharge, and (iv) any other costs determined by Castle Rock to be necessary and appurtenant. All revenues generated by the Collection System Development Fee, except for those revenues attributable to the Extraterritorial Surcharge, shall be invested by Castle Rock in the Collection System.

C. "Collection System Treatment Capacity" means wastewater treatment capacity in the Collection System Treatment Facility, in the event that such Facility is designed and constructed as part of the Project.

D. "Collection System Treatment Facility" means any treatment works, as defined in section 212 of the Federal Clean Water Act (33 U.S.C. §§1251, *et seq*.), that is designed and constructed as part of the Project to be used in the storage, treatment, recycling, and reclamation of domestic and/or industrial wastewater generated by customers of the System for purposes of complying with the Federal Clean Water Act.

E. "Collection System Treatment Facility Development Fee" means the fee that Castle Rock will charge to those persons seeking to develop or redevelop property within the Service Area for the right to connect to the Highway 85 Wastewater Collection and Treatment System. Said Fee shall be charged for the purpose of defraying all costs associated with design and construction of Collection System Treatment Facility and any improvements thereto, and shall consist of: (i) the capital recovery fee, which shall be calculated based on the Final Infrastructure Costs for the Collection System Treatment Facility, (ii) the capital improvement fee, which shall be calculated based on the costs of increasing the capacity of the Collection System Treatment Facility as may be necessary to serve new development or redevelopment in the Service Area, (iii) the Extraterritorial Surcharge, and (iv) any other costs determined by Castle Rock to be necessary and appurtenant. All revenues generated by the Collection System Treatment Facility Development Fee, except for those revenues attributable to the Extraterritorial Surcharge, shall be invested by Castle Rock in the Collection System Treatment Facility.

F. "Dominion" means the Dominion Water and Sanitation District, a quasi-municipal special district organized and existing pursuant to the provisions of Title 32 of the Colorado Revised Statutes.

G. "Dominion and Castle Rock Wastewater Service Agreement" means the intergovernmental agreement between Dominion and Castle Rock that will be executed in the event that Castle Rock proceeds with the alternative for the Project that utilizes any portion of the Dominion System in the design and construction of the Highway 85 Wastewater Collection and Treatment System.

H. "Dominion System" means any collection system or treatment works, as defined in section 212 of the Federal Clean Water Act (33 U.S.C. §§1251, *et seq*.), that is used by Dominion in the collection, storage, treatment, recycling, and reclamation of domestic and/or industrial wastewater generated by Dominion customers for purposes of complying with the Federal Clean Water Act.

I. "Dominion System Development Fee" means the fee that Castle Rock will charge and collect from those persons seeking to develop or redevelop property within the Service Area that connect to the Highway 85 Wastewater Collection and Treatment System and use any portion of the Dominion System. Said Fee shall be charged for the purpose of defraying all costs associated with connecting to the Dominion System, and shall consist of (i) the capital recovery fee, which shall be calculated based on the total infrastructure costs of the Dominion System, (ii) the capital

improvement fee, which shall be calculated based on the costs of increasing the capacity of the Dominion System as may be necessary to serve new development or redevelopment connecting to the Dominion System, (iii) the Extraterritorial Surcharge, and (iv) any other costs determined by Castle Rock to be necessary and appurtenant.

J. "Estimated Project Infrastructure Costs" means the estimated costs of designing, constructing and installing the Project Infrastructure, as more particularly described in the attached Exhibit A.

K. "Extraterritorial Surcharge" means the ten percent (10%) surcharge that Castle Rock will add to the Collection System Development Fees, the Collection System Treatment Facility Development Fees, the Dominion System Development Fee, the PCWRA Treatment System Development Fee, and all other rates and fees charged by Castle Rock in providing extraterritorial retail wastewater service to System customers.

L. "Final Project Infrastructure Costs" means the final costs of designing, constructing and installing the Project Infrastructure, as more particularly described in the amended Exhibit A.

M. "Louviers" means the Louviers Water and Sanitation District, a quasi-municipal special district organized and existing pursuant to the provisions of Title 32 of the Colorado Revised Statutes

N. "Louviers and Castle Rock Reuse Water Purchase and Sale Agreement" means the intergovernmental agreement between Louviers and Castle Rock for the purchase by Castle Rock of certain Reusable Water presently owned by Louviers.

O. "MGD" means million gallons per day.

P. "Necessary Improvement" means any improvement to Project Infrastructure, (i) the construction or installation of which Castle Rock reasonably deems to be a necessary prerequisite for any person seeking to develop or redevelop property within the Service Area to connect to the Highway 85 Wastewater Collection and Treatment System, and (ii) which is in addition to those improvements to Project Infrastructure that are funded by Collection System Development Fees, Collection System Treatment Facility Development Fees, or Dominion System Development Fees.

Q. "PCWRA Treatment Capacity" means wastewater treatment capacity that Castle Rock owns in the PCWRA wastewater treatment facility, which capacity may be used in the Highway 85 Wastewater Collection and Treatment System.

R. "PCWRA Treatment System Development Fee" means the fee that Castle Rock will charge and collect from Douglas County or existing and/or future customers

that connect to the Highway 85 Wastewater Collection and Treatment System and use PCWRA Treatment Capacity for the purpose of defraying all costs associated with connecting to the PCWRA wastewater treatment facility. Said Fee shall consist of: (i) the capital recovery fee, which shall be calculated based on the amount of PCWRA Treatment Capacity required for a Single Family Equivalent and retained by Castle Rock and (ii) the Extraterritorial Surcharge, which shall be retained by Castle Rock as reimbursement for the value of its Treatment Capacity in the PCWRA treatment facility. The current fee is set at $4,900 per Single Family Equivalent and shall be adjusted each year based on Castle Rock's annual study of rates and fees.

S. "Project" means the design, construction, and installation of the Highway 85 Wastewater Collection and Treatment System.

T. "Project Infrastructure" means the Highway 85 Wastewater Collection and Treatment System, all as more particularly identified in the description attached as Exhibit B and shown on the map attached as Exhibit B-1.

U. "Project Management Fee" means the fee that Castle Rock charges Douglas County to manage the design, construction, and installation of the Project, which fee shall be equal to one percent (1%) of the total Project costs.

V. "Reusable Water" means wastewater from water rights that can be used and reused to extinction, which wastewater shall be put into the Project Infrastructure and, thereby, made available for purchase by Castle Rock.

W. "Service Area" means the area located in unincorporated Douglas County within which Castle Rock will provide retail wastewater service through the Highway 85 Wastewater Collection and Treatment System as shown on the map attached as Exhibit C. Upon the delivery of written notice thereof to Castle Rock, Douglas County may designate additional property in unincorporated Douglas County to be included within the Service Area, subject to the availability of sufficient capacity in the System to serve such property.

X. "Single Family Equivalent" means the relative measure of demand placed on any wastewater facility or infrastructure by an average single-family residential unit.

Y. "System Development Fees" means, collectively and individually, as applicable, Collection System Development Fees, Collection System Treatment Facility Development Fees, Dominion System Development Fees and PCWRA Treatment System Development Fees.

2. DESCRIPTION OF PROJECT.

A. Consideration. Douglas County agrees to use available American Rescue Plan Act funds to: (i) finance the design, construction, and installation of a wastewater

collection and treatment system along the Highway 85 corridor, extending approximately from the unincorporated Town of Louviers to the PCWRA wastewater treatment facility , or as far south as such available funding will allow, and (ii) acquire all easements, whether temporary or permanent, rights-of-way, and other real property interests as may be necessary to construct, operate, maintain, repair, and replace the System. In consideration of obtaining access to available Reusable Water in vicinity of the Highway 85 corridor and the payment by Douglas County of the Project Management Fee, Castle Rock agrees to manage the design, construction, and installation of the Project Infrastructure.

B. Ownership. Upon the substantial completion of construction and the initial acceptance of the Project Infrastructure by Douglas County and Castle Rock, ownership of the Project Infrastructure shall be conveyed to Castle Rock by the general contractor of the Project, along with all warranties associated therewith. Thereafter, with the exception of those portions of the System it may convey to Dominion pursuant to the Dominion and Castle Rock Wastewater Service Agreement, Castle Rock agrees to own, operate, maintain, repair and replace the System and to provide retail wastewater service to those Douglas County residents within the Service Area who agree to connect to the System.

3. PROJECT DESIGN, CONSTRUCTION, AND INSTALLATION.

A. Costs. The Estimated Project Infrastructure Costs shall include, without limitation, the following costs incurred by Castle Rock: (i) staff time spent administering the work set forth herein, which time shall be accounted for within the Project Management Fee; (ii) design of the Project Infrastructure; (iii) easement research and acquisition, and any right-of-way or other permitting fees; and (iv) construction and contract management. Castle Rock shall track all costs incurred during the course of the Project; provided, however, that Douglas County acknowledges and agrees that Castle Rock staff time shall not be tracked.

B. Change Orders. Douglas County acknowledges and agrees that the Estimated Project Infrastructure Costs may increase at any time during the design, construction or installation of the Project Infrastructure. Castle Rock shall provide updated Estimated Project Infrastructure Costs to Douglas County on a quarterly basis through completion of the Project Infrastructure. Upon completion and initial acceptance of the Project Infrastructure, Castle Rock shall prepare an amended Exhibit A showing the Final Project Infrastructure Costs. Upon agreement of the Parties as to the amount of the Final Project Infrastructure Costs, the amended Exhibit A shall be substituted for the original Exhibit A and shall be incorporated into this Agreement.

C. Scope of Work. The general proposed scope of work for the Project Infrastructure and the estimated timeline are provided in the attached Exhibit D (the "Scope of Work"). As part of the Scope of Work, Castle Rock will evaluate the most cost-effective and beneficial overall approach to providing the Project Infrastructure and

long-term service to the existing and future residents of the Highway 85 corridor, while taking into account the total available funds for the Project and the costs to each portion of the Service Area. In so doing, Castle Rock shall consider the various benefits that will result from the Project to the broadest cross-section of Douglas County residents, including, but not limited to, environmental, economic development, and recreational benefits, as well as the availability of additional drinking water and reuse water supplies. In particular, this evaluation shall identify the most cost-effective and beneficial means of providing wastewater treatment from among the following three alternatives: (i) the construction of a new wastewater treatment facility in the unincorporated Town of Louviers, (ii) the construction of a new wastewater treatment facility on Dominion's property located along the South Platte River, and (iii) the utilization of Castle Rock's existing treatment capacity in PCWRA. Castle Rock will also work with Louviers to negotiate a separate intergovernmental agreement, the Louviers and Castle Rock Reuse Water Purchase and Sale Agreement, to purchase reuse water supply from Louviers, thereby providing Louviers with additional capital to reinvest in its water and wastewater system. These evaluations will be reviewed with Douglas County and agreed to prior to Castle Rock proceeding with final design of the Project Infrastructure. In the event that Castle Rock proceeds with the alternative set forth in Subsection C.(ii) above, Castle Rock will work with Dominion to negotiate a separate intergovernmental agreement, the Dominion and Castle Rock Wastewater Service Agreement to set forth the terms and conditions the will govern the construction of the wastewater treatment facility and the use of the Dominion System.

D. Examination of Records; Dispute Resolution. At Douglas County's request, Castle Rock shall provide records relating to the design, construction, and installation of the Project Infrastructure, including copies of each draw request from the general contractor, together with paid invoices or such other documentation as may be available and reasonably requested for Douglas County to verify the Final Project Infrastructure Costs. The Parties shall cooperate to resolve any disputes concerning the Final Project Infrastructure Costs. If the Parties are unable to resolve their dispute informally, they shall submit the dispute to non-binding mediation before a mutually agreeable mediator. If the Parties remain unable to resolve their dispute within sixty (60) days of commencing mediation, the Parties may pursue any remedies lawfully available to them.

E. Costs in Excess of Contingency. Castle Rock shall administer the Project in substantially the same manner and with the same care as other Castle Rock design and construction projects of a similar scope and nature. Castle Rock shall manage all change orders and costs adjustments within a contingency amount agreed to by the Parties. Adjusted cost estimates will be made based upon actual construction bids or change orders. If the Estimated Project Infrastructure Costs need to be adjusted over and above the contingency amount, Castle Rock shall give written notice to Douglas County. Douglas County shall have 30 days to provide approval of such additional costs. If Douglas County does not approve the additional costs,

the Parties will meet to review and identify opportunities to decrease the overall Scope of Work to bring the Estimated Project Infrastructure Costs within the amount of funding available under the American Rescue Plan Act. If the Parties cannot identify opportunities to decrease the overall Scope of Work and Estimated Project Infrastructure Costs, then the Parties agree to submit the dispute to non-binding mediation as provided in Subsection D of this Section.

F. Easements. Castle Rock agrees to undertake the acquisition of all easements, whether temporary or permanent, rights-of-way, and other real property interests as may be necessary to construct, operate, maintain, repair, and replace the Project. All such real property interests shall be granted to Castle Rock at the time of acquisition. in addition, provision shall be made for recreational trail easements in locations consistent with Douglas County's draft Plum Creek Regional Trail feasibility study. Any trail easements acquired by Castle Rock for this purpose shall be granted to Douglas County at the time of acquisition. Wherever feasible, such easements may be non-exclusive and occupy the same location as the real property interests granted to Castle Rock pursuant to this Subsection F.

G. Contract Solicitation. Castle Rock will undertake the bidding and contracting for design, property acquisition, and construction services utilizing its standard design and construction contracting processes. Selected consultants and contractors will be recommended to Douglas County by Castle Rock with Douglas County confirming approval of each contract prior to signing. Douglas County shall fully fund each contract prior to award by Castle Rock. For any construction contract, the Parties will enter into a separate agreement to establish an escrow account, which account shall be funded by Douglas County to the full amount of each such contract, plus a reasonable contingency. This escrow account will be used for payment of all invoices for each such contract. The Parties acknowledge and agree that the construction of the Project may be phased as the Parties may deem appropriate, and that separate construction contracts may be entered into for each phase of the Project.

H. Escrow. Castle Rock will review and approve all contractor invoices and then forward said invoices to Douglas County for approval on a monthly basis. Douglas County will review and approve said invoices within fifteen (15) days following receipt of the invoice and then submit the approved invoices to the escrow agent for payment to the contractor. Payment from the escrow account shall be made in full within thirty (30) days following receipt of the invoice from the contractor.

I. Insurance. Castle Rock will require each Project contractor to procure and maintain the following types and amounts of insurance in accordance with the requirements of Castle Rock's purchasing policies, with each policy to be issued to include Douglas County, its officers and employees, as and additional named insured:

(i) Commercial General Liability Insurance, including coverage for bodily injury, broad form property damage (including for contractual and

employee acts), blanket contractual, independent contractors, products, and completed operations, with minimum combined single limits of $1,000,000 for each occurrence and $1,000,000 aggregate.

(ii) Comprehensive Automobile Liability Insurance, including coverage for each of the contractor's owned, hired and/or non-owned vehicles assigned to or used in performance of the services, with minimum combined single limits for bodily injury and property damage of not less than $1,000,000 for each occurrence and $1,000,000 aggregate.

(iii) Workers' Compensation Insurance to cover obligations imposed by the Workers Compensation Act of Colorado and any other applicable laws for any employee engaged in the performance of work under the contract, and Employer's Liability insurance with minimum limits of $500,000 each accident, $500,000 disease-policy limit, and $500,000 disease-each employee.

(iv) Builder's Risk or Installation Floater Policy, at Castle Rock's discretion, in an amount equal to the value of the Project where the possibility exists of loss or damage to the Project (for the construction contract only).

(v) Professional Liability Insurance, including coverage for damages or claims for damages arising out of the rendering, or failure to render, any professional services, with minimum combined single limits of $1,000,000 for each occurrence and $1,000,000 aggregate (for the design contract only).

4. CAPACITY ALLOCATION.

A. Capacity Reservation and Allocation. Concurrent with the substantial completion and initial acceptance of the Project Infrastructure, Castle Rock shall grant Douglas County a license for Douglas County's proportional share in the permanent capacity of the System (the "License"). Castle Rock will retain adequate capacity in the System for the purpose of providing retail or wholesale wastewater service to Louviers. All remaining capacity shall be granted to Douglas County by virtue of the License. This will result in an estimated initial allocation of permanent capacity in the System of 10% for Castle Rock and 90% for Douglas County. A final allocation shall be determined by the Parties at the time of final design and construction of the Project Infrastructure. As new customers connect to the System, Castle Rock's share of the allocation of permanent capacity shall increase, while Douglas County's share of the allocation of permanent capacity will decrease, by the amount of permanent capacity needed to serve each new customer.

B. Access Restriction. The Parties acknowledge and agree that the License granted herein is for capacity in the System only. Following the transfer of ownership of Project Infrastructure as provided in Subsection A of this section, Douglas County

shall not at any time access the Project Infrastructure or other facilities or property owned or controlled by Castle Rock, except pursuant to the terms, restrictions and conditions set forth in this Agreement.

C. License Capacity. The total capacity of the Project Infrastructure is set forth in Exhibit B. The License granted to Douglas County is limited to the percentage share set forth in Subsection A of this Section, which share may not be sold or assigned by Douglas County. If the total capacity of the Project Infrastructure should ever exceed the amounts set forth in Exhibit B for any reason, as determined by Castle Rock in its sole discretion, the excess capacity shall be allocated to Douglas County until such time as new customers connect to the System and such capacity is allocated to Castle Rock as set forth in Subsection A of this Section.

D. Capacity Restriction. If capacity in the Project Infrastructure is restricted on account of maintenance, emergencies, force majeure, or legal or regulatory requirements, Castle Rock shall forthwith advise Douglas County of such capacity restriction and the anticipated duration thereof, and apportion capacity in the Project Infrastructure based upon Douglas County's proportional share of Project Infrastructure capacity.

E. Conveyance of Capacity. Castle Rock will be the retail provider of wastewater service in the Service Area. With regard to property within the Service Area that (i) is undeveloped as of January 1, 2023, or (ii) is fully developed, but for which approval is being sought from Douglas County to redevelop, the property owner shall submit an application to Douglas County for the development or redevelopment of such property, which application shall include a request to connect to the System. Within fifteen (15) days of receipt, Douglas County shall notify Castle Rock of each such application. Castle Rock will then calculate the amount of System Development Fees that it will charge the applicant for the right to connect to the System. Castle Rock will also determine what Necessary Improvements, if any, are required as a condition precedent for the applicant to connect to the System. Thereafter, Castle Rock will provide a "will serve" letter to the applicant stating the total System Development Fees that the applicant will be required to pay and identifying the Necessary Improvements that the applicant will be required to provide. Douglas County, as the land use agency for the Service Area, will provide the required review(s) for the development or redevelopment application in accordance with its land use rules and regulations. Upon approval by Douglas County of the development or redevelopment application, the payment of all applicable System Development Fees to Castle Rock, and the substantial completion of all Necessary Improvements, the applicant will be allowed to connect to the System and retail wastewater service shall be provided to the newly developed or redeveloped property.

With regard to property within the Service Area that is fully developed as of January 1, 2023, and for which no approval is being sought from Douglas County to redevelop, the property owner shall submit an application to Douglas County for

connection to the System. Within fifteen (15) days of receipt, Douglas County shall notify Castle Rock of each such application. If Douglas County has adequate capacity to serve the property under the License granted by Subsection C of this Section, Castle Rock will then determine what Necessary Improvements, if any, are required as a condition precedent for the applicant to connect to the System. Thereafter, Castle Rock will provide a "will serve" letter to the applicant identifying the Necessary Improvements that the applicant will be required to provide. No System Development Fees will be charged to the applicant, as long as Douglas County has adequate capacity to serve the property; provided, however, that if the applicant will be using PCWRA Treatment Capacity, Castle Rock will charge and collect from the property owner the PCWRA Treatment System Development Fee. If Douglas County does not have adequate capacity available, then the application will be treated as if it is an application for the development or redevelopment of property within the Service Area. In such cases, Castle Rock will calculate System Development Fees in a manner similar to how they are calculated for new development or redevelopment. Upon approval by Douglas County of the connection application and the substantial completion of all Necessary Improvements, and, if applicable, the payment of System Development Fees to Castle Rock, the applicant will be allowed to connect to the System and retail wastewater service shall be provided to the property.

Each connection shall meet all of Castle Rock's connection requirements, which requirements are generally set forth in Title 13 of the Castle Rock Municipal Code. If PCWRA Treatment Capacity is being used, such connection shall also meet the PCWRA Code of Rules and Regulations dated May 19, 2020, and adopted by reference pursuant to Section 13.04.020 of the Castle Rock Municipal Code. If Dominion's System is used to provide wastewater service, the applicant must also meet all of Dominion's connection requirements., As consideration for allowing the connection to the System, Douglas County will allocate to Castle Rock the pro-rated capacity in the Project Infrastructure that will be used by new development or redevelopment. The allocation of such capacity shall be memorialized in an annual statement to be provided by Castle Rock to Douglas County by no later than thirty (30) days following the end of each calendar year. Within thirty (30) days following the date upon which all capacity in the Project Infrastructure has been allocated to Castle Rock pursuant to the terms of this Subsection E, Castle Rock will send Douglas County written notice that the License granted to Douglas County herein is terminated.

F. Dominion System Development Fee. Notwithstanding any provision of this Agreement to the contrary, the Dominion System Development Fee shall not be charged and collected until such time as the average daily capacity of the Highway 85 Wastewater Collection and Treatment System exceeds 200,000 gallons of wastewater. Thereafter, if any portion of the Dominion System is being used, Castle Rock will commence collecting Dominion System Development Fees and, with the exception of the Extraterritorial Surcharge, remit any such Fees it collects to Dominion.

G. Renewable Water Requirement. For new development or redevelopment in the Service Area, after the first 200,000 gallons of wastewater capacity has been allocated, Castle Rock will require new development and redevelopment requiring capacity beyond the first 200,000 gallons to have renewable water supply for their development as a condition precedent to obtaining a "will serve" letter from Castle Rock to connect to the System.

H. Limitations. The allocation of costs set forth herein between Castle Rock and Douglas County is intended to apply solely to the costs of designing, constructing, and installing the Project Infrastructure, and shall not be construed to include costs and fees related to the operation, maintenance, repair, or replacement of the Project Infrastructure. Such costs and other related terms and conditions, shall be managed by Castle Rock as the retail wastewater provider in the Service Area in accordance with Castle Rock's standard rate setting policies and procedures.

I. Warranty. Upon the completion of construction, initial acceptance, and conveyance of the Project Infrastructure, Castle Rock shall be the sole owner of the Project Infrastructure and all warranties associated therewith, subject to the rights of Douglas County as further set forth herein. Castle Rock represents and warrants to Douglas County that Castle Rock either has, or will obtain, all necessary right, title and interest in the Project Infrastructure to convey the License set forth in Subsection A of this Section. Castle Rock does covenant and agree that it shall warrant and forever defend Douglas County in its quiet and peaceful possession of its license rights granted herein against all and every person or persons. In the event that the license or any part thereof is challenged by the person or entity granting rights, interests or title to Castle Rock or any portion thereof, Castle Rock shall, to the extent permitted by law, take all necessary actions to acquire the requisite interest needed to satisfy its obligations hereunder; provided that, for so long as Douglas County has capacity in the System, Douglas County may be required by Castle Rock to pay its proportional share of the costs related to any action taken by Castle Rock if the need for such action is not due to the negligence of Castle Rock.

J. Insurance. Castle Rock shall procure and maintain property insurance for the Project Infrastructure that is substantially similar to the coverage maintained by Castle Rock for other similar Castle Rock-owned water and wastewater infrastructure. If the Project Infrastructure is damaged, Castle Rock shall allocate all proceeds from the insurance policy towards repairing the Project Infrastructure.

5. AMERICAN RESCUE PLAN ACT PROVISIONS.

A. Acknowledgement. Castle Rock acknowledges and agrees that the funds encumbered by Douglas County to pay for the design, construction, and installation of the Project Infrastructure, and the acquisition of all easements, rights-of way, and other real property interests necessary and appurtenant thereto, have been provided in accordance with Section 603(b) of the Social Security Act, as added by

Section 9901 of the American Rescue Plan Act, Public Law No. 117-2 (March 11, 2021) (together with all rules and regulations promulgated thereunder, "ARPA"). The Parties acknowledge that all funding from ARPA ("ARPA Funds") may only be used to cover those eligible costs incurred by Douglas County during the period that begins on March 3, 2021, and ends on December 31, 2024, including costs incurred to make necessary investments in sewer infrastructure. The Parties anticipate that the total amount of ARPA Funds available for the Project shall not exceed $26,800,000.

B. Use of ARPA Funds. Castle Rock shall only utilize ARPA Funds for the purposes described in this Agreement. Castle Rock agrees and acknowledges that, as a condition to receiving the ARPA Funds, it shall strictly follow the Coronavirus Local Fiscal Recovery Fund Award Terms and Conditions attached as Exhibit E. All invoices submitted by Castle Rock to Douglas County pursuant to this Agreement shall use "COVID-19" or "Coronavirus" as a descriptor for those costs that are paid by ARPA Funds to facilitate the tracking of Agreement-related spending related to COVID-19. Castle Rock shall segregate and specifically identify the time and expenditures billed to Douglas County on each invoice to allow for future review and analysis of COVID-19 related expenses. To avoid an unlawful duplication of federal benefits, the Parties agree and acknowledge that the services provided by Castle Rock for which ARPA Funds are used shall not, to the extent that ARPA Funds are used, also be paid for or reimbursed by monies provided under any other federal program.

C. ARPA Deadlines. Douglas County agrees and acknowledges that it shall obligate the use of ARPA funds for the services performed by Castle Rock under this Agreement no later than December 31, 2024. Castle Rock agrees and acknowledges that all services performed by Castle Rock using ARPA Funds must be performed by no later than December 31, 2026.

D. Reporting Requirements. To the extent that Castle Rock's services hereunder contemplate the spending of ARPA Funds, Castle Rock shall provide to Douglas County information responsive to mandatory performance measures, including programmatic data sufficient to conduct oversight as well as understand aggregate program outcomes. Further, in providing the ARPA-required information to the City, to the extent possible, Castle Rock shall provide this programmatic data related to such services disaggregated by race, ethnicity, gender, income, and other relevant demographic factors as may be determined by Douglas County. Castle Rock shall insert the foregoing requirement into all subcontracts related to this Agreement, thereby obligating all subcontractors to the same reporting requirement as Castle Rock.

E. Inspection of Records. Castle Rock shall maintain records of the documentation supporting the use of ARPA Funds in an auditable format, for the later of five (5) years after final payment on this Agreement or the expiration of the applicable statute of limitations. Any authorized agent of Douglas County or of the Federal

government, including the Special Inspector General for Pandemic Recovery, have the right to access, and the right to examine, copy and retain copies, at the official's election in paper or electronic form, any pertinent books, documents, papers and records related to Castle Rock's use of ARPA Funds pursuant to this Agreement. Castle Rock shall cooperate with Federal and Douglas County representatives and such representatives shall be granted access to the foregoing documents and information during reasonable business hours and until the latter of five (5) years after the final payment under this Agreement or expiration of the applicable statute of limitations. No examination of records and audits pursuant to this section shall require Castle Rock to make disclosures in violation of state or federal privacy laws.

6. DEFAULT/REMEDIES. In the event a Party deems the other Party to be in default, it shall provide written notice indicating the event of default. The defaulting party shall have thirty (30) days from the date of the notice to cure the stated default or, if such default is not capable of being cured within thirty (30) days, cure of such default shall commence and be diligently pursued. In no event shall the cure period exceed thirty (30) days for monetary defaults, or sixty (60) days for non-monetary defaults, except by written consent of the non-defaulting party. In the event the defaulting party has failed to cure in accordance with this Section, the non-defaulting party may pursue all available remedies at law or equity. In addition, Castle Rock shall have the ability to withhold services to manage the design and construction of the Project Infrastructure due to a monetary default by Douglas County.

7. MISCELLANEOUS.

A. Governing Law and Venue. The Parties hereto agree that exclusive jurisdiction and venue for the resolution of any dispute relating to this Agreement shall lie in the District Court for Douglas County, State of Colorado.

B. Entire Agreement. This Agreement constitutes the entire agreement between the parties relating to the subject matter thereof, and there are no prior or contemporaneous agreements, either oral or written, relating to the subject matter hereof except as expressly set forth herein.

C. Agreement Modification. The Agreement may not be amended, altered, or otherwise changed except by a written agreement between the Parties.

D. Counterpart Execution. The Agreement may be executed in one or more counterparts, each of which when executed shall be deemed an original, all of which together shall constitute one and the same instrument. Executed copies hereof may be delivered by electronic delivery and, upon receipt, shall be deemed originals and binding upon the parties hereto.

E. Governmental Immunity. Nothing in this Agreement shall be construed to waive, limit, or otherwise modify, in whole or in part, any governmental immunity that may be available by law to the Parties or their officials, employees, contractors, or

agents, or any other person acting on behalf of the Parties and, in particular, governmental immunity that may be afforded or available to the Parties pursuant to the Colorado Governmental Immunity Act, Title 24, Article 10, Part 1 of the Colorado Revised Statutes.

F. Assignability. This Agreement and the License granted herein may not be assigned, pledged or transferred, in whole or in part, without the express written consent of the other Party which consent shall not be unreasonably withheld.

G. No Public Dedication/No Third Party Beneficiary. Nothing contained herein shall be deemed to be a grant or dedication of any rights or use to the public in general, and no third party beneficiary interests are created nor intended to be created by this Agreement.

H. Headings for Convenience. The headings and captions in this Agreement are intended solely for the convenience of reference and shall be given no effect in the construction or interpretation of this Agreement.

I. Notice. Any notice required or permitted by this Agreement shall be in writing and shall be deemed to have been sufficiently given for all purposes if sent by certified mail or registered mail, postage and fees prepaid, addressed to the party to whom such notice is to be given, at the address set forth below, or at such other address as has been previously furnished in writing, to the other party. Such notice shall be deemed to have been given when deposited in the United States mail.

If to Castle Rock: Town of Castle Rock
Attn: Director of Castle Rock Water
175 Kellogg Court
Castle Rock, CO 80109

with copy to: Town of Castle Rock
Attn: Town Attorney
100 N. Wilcox Street
Castle Rock, CO 80104

If to Douglas County: Douglas County
Attn: Special Projects Manager
100 Third Street
Castle Rock, CO 80104

with copy to: Douglas County
Attn: County Attorney
100 Third Street
Castle Rock, CO 80104

J. No Waiver. No waiver of any of the provisions of this Agreement shall be deemed to constitute a waiver of any other of the provisions of this Agreement, nor shall such waiver constitute a continuing waiver unless otherwise expressly provided herein, nor shall the waiver of any default hereunder be deemed a waiver of any subsequent default hereunder.

K. Recordation. The Parties agree that this Agreement may be recorded in the records of the Clerk and Recorder for county in which a Party has its principal place of business.

L. Binding Agreement. The benefits and burdens of this Agreement shall inure to and be binding upon on the successors, and assigns of the Parties.

M. Definitions and Interpretations. Except as otherwise provided herein, nouns, pronouns and variations thereof shall be deemed to refer to the singular or plural, and masculine or feminine, as the context may require. Any reference to a policy, procedure, law, regulation, rule or document shall mean such policy, procedure, law, regulation, rule or document as it may be amended from time to time.

N. Survival of Representations. Each and every covenant, promise, and payment contained in this Agreement shall survive each and be binding and obligatory upon each of the Parties and shall not merge into any deed, assignment, covenant, escrow agreement, easement, lease or any other document.

O. Non-Severability. Each Section of this Agreement is intertwined with the others and is not severable unless by mutual consent of the Parties.

P. Effect of Invalidity. If any portion of this Agreement is held invalid or unenforceable for any reason by a court of competent jurisdiction as to either Party or as to both Parties, the Parties will immediately negotiate valid alternative portions) that as near as possible give effect to any stricken portion(s).

Q. Force Majeure. Each Party shall be excused from performing its obligations under this Agreement during the time and to the extent that it is prevented from performing by a cause beyond its control, including, but not limited to: any incidence of fire, flood, or strike; acts of God; action of the government (except the parties hereto); war or civil disorder; violence or the threat thereof; severe weather; commandeering of material, products, plants or facilities by the federal, state or local government (except the parties hereto); and national fuel shortage, when satisfactory evidence of such cause is presented to the other Party, and provided further, that such nonperformance is beyond the reasonable control of, and is not due to the fault or negligence of, the Party not performing.

IN WITNESS WHEREOF, this Agreement is executed by the Parties hereto as of the date first written above.

(Signature pages to follow)

ATTEST:

_____
Lisa Anderson, Town Clerk

TOWN OF CASTLE ROCK

_____
Jason Gray, Mayor

Approved as to form:

_____
Michael J. Hyman, Town Attorney

Approved as to content:

_____
Mark Marlowe, Director Castle Rock Water

STATE OF COLORADO)
) *ss.*
COUNTY OF DOUGLAS)

The foregoing instrument as acknowledged before me this __ day of _____, 2023, by Lisa Anderson as Town Clerk and Jason Gray as Mayor of the Town of Castle Rock, Colorado.

Witness my official hand and seal.

My commission expires:

_____
Notary Public

ATTEST:

BOARD OF COUNTY COMMISSIONERS OF THE COUNTY OF DOUGLAS

_____ _____
_____ _____

Approved as to form:

_____
_____

STATE OF COLORADO)
) *ss.*
COUNTY OF DOUGLAS)

The foregoing instrument as acknowledged before me this __ day of _____, 2023, by _____ for the Board of County Commissioners of the County of Douglas.

Witness my official hand and seal.

My commission expires:

_____
Notary Public

Exhibit A

Estimated Costs of Project Infrastructure

Alternative 1 - Phase 1

Asset Description	Unit	$/Unit or $/Each	Total in $ Million
Louviers LS (0.2 MGD)	1	$2.5 Million/Each	$2.50
Louviers Force Main (1 MGD)	3.6 Miles	$1.32 Million/Mile	$4.75
Sedalia LS (0.4 MGD)	1	$4 Million/Each	$4.00
Sedalia Force Main (1 MGD)	4 Miles	$1.32 Million/Mile	$5.30
Tap Fees up to 0.2 MGD at 200 gpd/SFE	1,000 SFE	$4,900/SFE	$4.90
Easements (30 Ft Wide)	8 Miles	$0.206 Million/Mile	$1.70
Engineering & Design	1	$1.6 Million	$1.60
Construction Oversight	1	$0.8 Million	$0.80
Total			$25.55
Budget			$26.80

Alternative 1 - Phase 2

Asset Description	Unit	$/Unit or $/Each	Total in $ Million
Titan Force Main (1 MGD)	2 Miles	$1.32 Million/Mile	$2.64
Easements (30 Ft Wide)	2 Miles	$0.206 Million/Mile	$0.41
Sterling Ranch Gravity Sewer (1MGD)	1 Mile	$1.32 Million/Mile	$1.32
Easements (30 Ft Wide)	2 Miles	0.206 Million/Mile	$0.41
Louviers from Sedalia Gravity Sewer (1 MGD)	3.6 Miles	$1.32 Million/Mile	$4.75
Easements (30 Ft Wide)	3.6 Miles	$0.206 Million/Mile	$0.74
Gravity Sewer North of PCWRA (1 MGD)	4 Miles	$1.32 Million/Mile	$5.30
Easements (30 Ft Wide)	4 Miles	$0.206 Million/Mile	$0.82
Tap Fees up to 0.8 MGD at 200 gpd/SFE	4,000 SFE	$4,900/SFE	$19.60
Engineering & Design	1	$1.4 Million	$1.40
Construction Oversight	1	$0.7 Million	$0.70
Total			$38.09

Total Project Cost $63.64

Alternative 2 - Phase 1

Asset Description	Unit	$/Unit or $/Each	Total in $ Million
Louviers WWTP (0.4 MGD)	1	$14 Million	$14.00
Sterling Ranch Gravity	1 Mile	$1.32 Million/Mile	$1.32
Louviers from Sedalia Gravity Sewer (1 MGD)	3.6 Miles	$1.32 Million/Mile	$4.75
Pump Station for Louviers return to CRR#2	1	$1.75	$1.75
Louviers return to CRR #2 (1 MGD)	3 Miles	$1.32 Million/Mile	$4.00
Easements (30 Ft Wide)	7.6 Miles	$0.206/Mile	$1.57
Engineering & Design	1	$2.6 Million	$2.60
Construction Oversight	1	$1.3 Million	$1.30

Total			$31.29
Budget			$26.80

Alternative 2 - Phase 2

Asset Description	**Unit**	**$/Unit or $/Each**	**Total in $ Million**
Titan Force Main (1 MGD)	2 Miles	$1.32 Million/Mile	$2.64
Easements (30 Ft Wide)	2 Miles	$0.206 Million/Mile	$0.41
Gravity Sewer North of PCWRA (1 MGD)	4 Miles	$1.32 Million/Mile	$5.30
Easements (30 Ft Wide)	4 Miles	$0.206 Million/Mile	$0.82
Louviers WWTP (0.6 MGD)	1	$18 Million	$18.00
Engineering & Design	1	$2.6 Million	$2.60
Construction Oversight	1	$1.3 Million	$1.30
Total			$31.07

Total Project Cost $62.36

Alternative 3 - Phase 1

Asset Description	**Unit**	**$/Unit or $/Each**	**Total in $ Million**
Titan Force Main (1 MGD)	2 Miles	$1.32 Million/Mile	$2.64
Louviers LS (0.2 MGD)	1	$2.5 Million/Each	$2.50
S. Platte Pump Station (0.2 – 6.2 MGD)	1	$3.5 Million	$3.50
S. Platte WWTP (0.4 MGD)	1	$14 Million	$14.00
Easements (30 Ft Wide)	2 Miles	$0.206 Million/Mile	$0.41
Engineering & Design	1	$1.75 Million	$1.75
Construction Oversight	1	$0.5 Million	$0.50
Total			$25.30
Budget			$26.80

Alternative 3 - Phase 2

Asset Description	**Unit**	**$/Unit or $/Each**	**Total in $ Million**
Sterling Ranch Gravity Sewer (1 MGD)	1 Mile	$1.32 Million/Mile	$1.32
Louviers from Sedalia Gravity Sewer (1 MGD)	3.6 Miles	$1.32 Million/Mile	$4.75
Easements (30 Ft Wide)	4.6 Miles	$0.206 Million/Mile	$0.95
Gravity Sewer North of PCWRA (1 MGD)	4 Miles	$1.32 Million/Mile	$5.30
Easements (30 Ft Wide)	4 Miles	$0.206 Million/Mile	$0.82
S. Platte WWTP (to 1.0 MGD)	1	$18 Million	$18.00
Engineering & Design	1	$2.90 Million	$2.90
Construction Oversight	1	$1.5 Million	$1.50
Additional Dominion Capacity	4000 SFE	$1,000/SFE	$4.00
Total			$39.54

Total Project Cost $64.84

Exhibit B

Description of Project Infrastructure

There are three potential project alternatives to describe for the project. A summary Phase 1 of each project alternative to be funded with the ARPA funds is provided below:

- Alternative 1 - All force main with two lift stations (one in Louviers and one in Sedalia) with treatment at PCWRA with discharge to East Plum Creek and reuse through Castle Rock's existing system.
- Alternative 2 – Louviers Wastewater Treatment Plant with a gravity sewer from Sedalia with discharge of the wastewater effluent to Plum Creek and/or piping of the wastewater to the Castle Rock reservoir system for reuse through Castle Rock's existing system.
- Alternative 3 – Chatfield Basin Water Reclamation Facility (CBWRF) with a lift station at Louviers and a force main from Louviers to a Sterling Ranch gravity sewer then on to the Titan Road lift station and force main for delivery to CBWRF with reuse water pumped back to the Castle Rock reservoir system for reuse through Castle Rock's existing system.

Each alternative has two phases for full implementation, but only Phase 1 will be funded with the ARPA funds.

Alternative 1. This alternative consists of lift stations and force mains that all flow to PCWRA for wastewater treatment. In Phase 1 of this alternative, lift stations are built at the present site of the Louviers facultative lagoon and a to-be-determined site in Sedalia. A force main would be constructed to connect from the Louviers lift station to the Sedalia lift station. From the Sedalia lift station another force main would be constructed to PCWRA for wastewater treatment. A force main from Dominion's Titan Road lift station would be constructed that would connect to the Louviers lift station. Any remaining funds would be used to construct gravity sewer along the corridor tying into one of the lift stations. Water reuse would be accomplished by allowing the wastewater to discharge to East Plum Creek and then get picked up as creek water flow at Castle Rock's Plum Creek Diversion facility in Sedalia. In Phase 2 of this alternative, the infrastructure to be added would be a gravity flow sewer from south of Sedalia to the Sedalia lift station and a gravity flow sewer from north of the Sedalia lift station connecting into the Louviers lift station and any necessary upgrades to the lift stations.

The advantage of Alternative 1 is that it has the lowest initial capital investment. The ease of construction of two lift stations and pipelines is advantageous to the timeline completion of the project. The drawback of Alternative 1 is that the retention times of the wastewater in the force mains will be long and gravity sewer connections can only be made near the lift stations in Phase 1. The long retention times in the force mains will result in odors and will require high operating costs to remove. There are also significant costs for pumping of all the wastewater. The gravity sewer connections only near the lift stations will require additional pipe and easements to construct the Phase 2 gravity sewer mains for the entire project corridor.

Alternative 2. This alternative consists of a Louviers wastewater treatment plant with a gravity sewer coming from south of Sedalia. In Phase 1 of this alternative, a wastewater treatment plant at the Louviers facultative lagoon would be built for treating existing wastewater from the Louviers residences with discharge to Plum Creek and/or Castle Rock's CRR#2/CRR#1

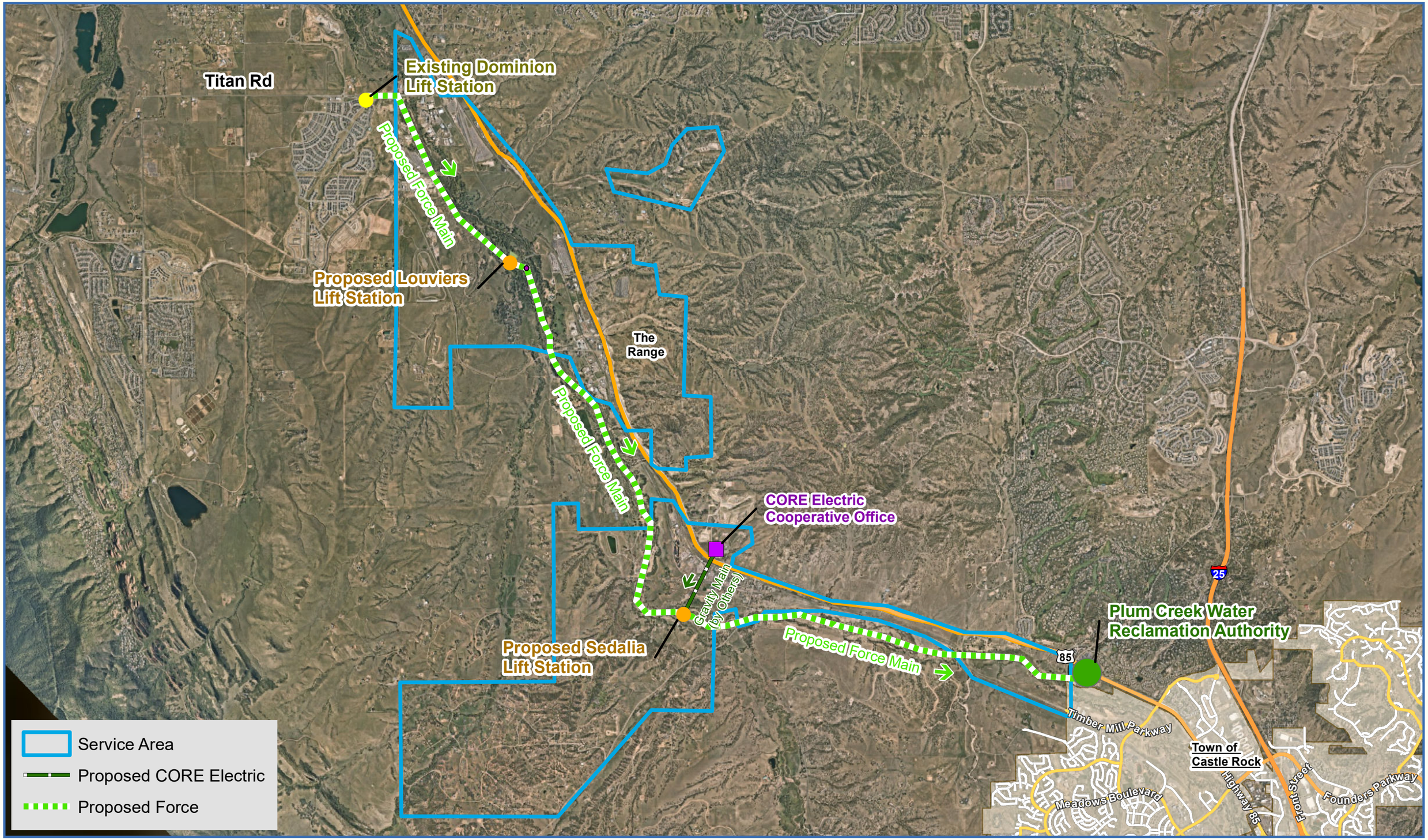
reservoirs via a constructed reuse water pipeline. A gravity sewer from Sedalia would also be constructed. In Phase 2 of this alternative, the infrastructure to be added would be any gravity sewer not completed in Phase 1 to south of Sedalia towards PCWRA, expansion of the plant capacity and the addition of solids handling facilities at the plant.

The advantage of Alternative 2 is that it utilizes more gravity options to reduce pumping energy, operations and maintenance costs by eliminating 2 lift stations and it also greatly reduces odor considerations from Alternative 1. Potential odor impacts and odor control costs in Louviers and Sedalia would be greatly reduced although Louviers would still have odor from a wastewater treatment plant. The consideration of Alternative 2 is that a pump station is needed to return water to Castle Rock along with a pipeline. However, the reuse water could be discharged to Plum Creek and picked up in Chatfield Reservoir as part of Castle Rock's Chatfield Pump Back project. This Alternative does require a new wastewater discharge permit to Plum Creek and to the CRR1/CRR2 reservoir system whereas in Alternative 1 PCWRA does have an existing Colorado stream discharge permit. These permits can be very difficult and time consuming to obtain. Since Plum Creek is an impacted creek, permit levels would likely be very low. This Alternative also requires new solids handling facilities which are very expensive to construct and operate.

Alternative 3. This alternative consists of an adjacent South Platte River located wastewater treatment plant (Chatfield Basin Water Reclamation Facility), a Louviers lift station and a force main from the Louviers lift station to the Sterling Ranch gravity sewer which flows to Dominion's Titan Road lift station, the system utilizes Dominion's system of force mains and gravity sewers to move the waste water from the Plum Creek watershed to the South Platte River area at the existing Roxborough lift station location. In Phase 1 of this alternative, a wastewater treatment plant will be built near the current Roxborough Water and Sanitation District's lift station off Waterton Road on Caretaker Road on 12.5 Acres owned by Dominion that will connect to Dominion's system of gravity sewers, force mains and lift stations along with wastewater coming from a force main connected to a Louviers lift station. The waste water will be discharged to the South Platte River and/or a newly constructed water pump station that will connect to Castle Rock's Ravenna pipeline for discharge at Castle Rock's CRR#1/CRR#2 reservoirs. In Phase 2 of this alternative, a gravity flow sewer will be built from the south originating north of PCWRA to the Louviers lift station. Additional capacity in the Dominion lift station and force main and in the CBWRF will also need to be constructed in Phase 2.

The advantages of Alternative 3 are that it provides wastewater treatment initially for Louviers residences and Sterling Ranch and later for Sedalia along with a connectable gravity interceptor sewer in the Colorado Highway 85 corridor. Although the Plum Creek watershed wastewater could be discharged to the South Platte River watershed along with the Dominion derived wastewater, the plan is to pump back the Plum Creek watershed derived reuse water and in the near term Dominion's reuse water via Castle Rock's Ravenna pipeline to Castle Rock's reservoirs. In addition, this Plum Creek watershed reuse water can be captured in the Chatfield Reservoir through Castle Rock's planned Chatfield Pump Back project for return to the Plum Creek watershed. Dominion's wastewater would no longer flow through the Roxborough Water and Sanitation District's very long force main to the South Platte Renew wastewater treatment plant which is a costly energy pumping expense. A consideration of Alternative 3, like Alternative 1 is that there would be a long retention time in the system's sewage piping and pumping system which would cause odors and the need for odor control for some manholes

and at the new CBWRF. This Alternative does not require a new wastewater stream discharge permit as Dominion already has one. This option will require a second discharge permit, similar to Alternative 2 to the CRR1/CRR2 reservoir system. This option also provides the ability to handle sewage before the wastewater plant is complete as the water can continue to go to South Platte Renew until the new plant is complete. Another advantage of this option is that solids handling will not be needed at CBWRF as the solids can continue to be sent to South Platte Renew for treatment over the long term.



Castle Rock Water
Securing our future drop by drop

0 0.5 1 2 Miles

1 inch = 4,500 feet

N

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Exhibit B-1
Project Infrastructure
Alternative 1, Phase 1

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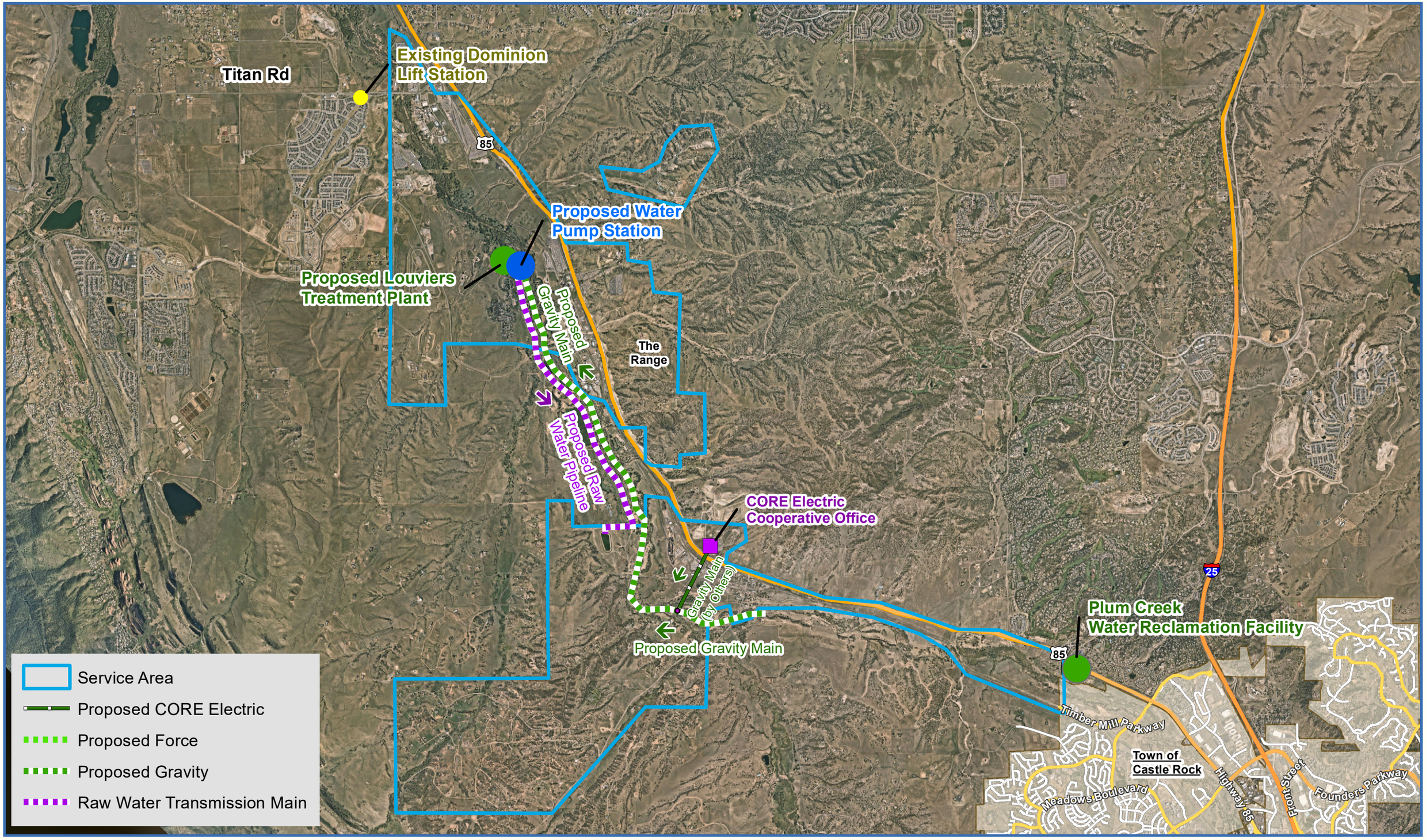
Date: 3/31/2023



CASTLE ROCK Qwater
Securing our future drop by drop

0 0.5 1 2 Miles

1 inch = 4,500 feet

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Exhibit B-1
Project Infrastructure
Alternative 2, Phase 1

Document Path: J:\B. PLAN & ENG\11.0 CIP\11.9. Projects\WW Fund\Regional Wastewater\GIS\Exhibit_B_Alt2_4_13_23.mxd

Date: 4/13/2023

Titan Rd

Existing Dominion Lift Station

Project Area Phase One

Existing Force Main

Existing Gravity Main

Proposed Water Pump Station

Existing Gravity Main

Proposed WWTP

Proposed Force Main

Proposed Louviers Lift Station

The Range

Proposed Gravity Main

Existing Water Pipeline

CORE Electric Cooperative Office

Project Area Phase Two

Gravity Main (by Others)

Proposed Gravity Main

Plum Creek Water Reclamation Authority

25

85

Timber Mill Parkway

Town of Castle Rock

Meadows Boulevard

Highway 85

Founders Parkway

Raw Water Transmission Mains
Service Area
Proposed CORE Electric
Existing Force
Proposed Force
Existing Gravity
Proposed Gravity

Castle Rock Water
Securing our future drop by drop

0 0.5 1 2 Miles

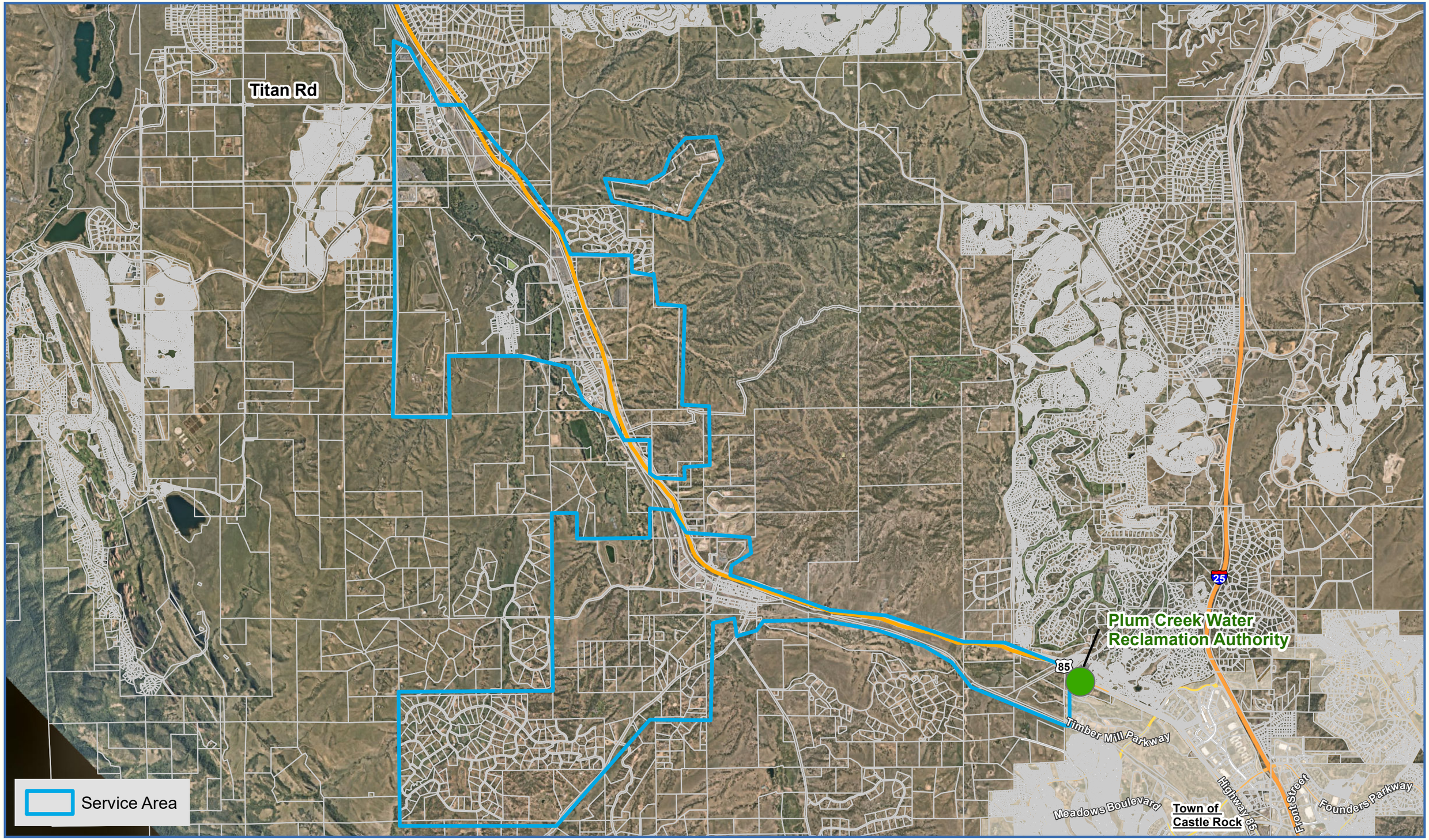
1 inch = 4,500 feet

Disclaimer: The data presented has been compiled from various sources, each of which introduces varying degrees of inaccuracies or inconsistencies. Such discrepancies in data are inherent and in supplying this product the Town of Castle Rock assumes no liability for it's use or accuracy. Questions or comments regarding the cartographic composition of this map including, but not limited to, errors, omissions, corrections, and/or updates, should be directed to the Utilities Department, Town of Castle Rock, (720) 733-6056. Copyright 2023, Town of Castle Rock Utilities Mapping.

Exhibit B-1
Project Infrastructure
Alternative 3

Document Path: J:\B. PLAN & ENG\11.0 CIP\11.9. Projects\WW Fund\Regional Wastewater\GIS\Exhibit_B_Alt3_3_31.mxd

Date: 3/31/2023



0 0.5 1 2 Miles

1 inch = 4,500 feet

Document Path: J:\B. PLAN & ENG\11.0 CIP\11.9. Projects\WW Fund\Regional Wastewater\GIS\Boundary_Exhibit_C.mxd

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Date: 3/31/2023

Exhibit C - Highway 85 Wastewater Collection and Treatment System Projected Service Area

Exhibit D

Regional Waste Water Collection and Treatment

Scope of Work

General Information and Background

The focus of this project is to improve wastewater treatment in the corridor as described below for the benefit of Douglas County residents. Although there are many economic, social and environmental benefits of this project, several of the specific impacts are listed below.

Water Supply Impact

As East Plum Creek flows north from Castle Rock, CO to join West Plum Creek near Sedalia, Colorado, it forms the main stem of Plum Creek which continues to flow north to the east leg of the Chatfield Reservoir. At Chatfield Reservoir (owned and operated by the United States Army Corps of Engineers) the South Platte River flows into the west leg of the reservoir. Besides providing flood control, environmental and recreational benefits, the comingling of the South Platte River and Plum Creek in the Chatfield Reservoir produces a supply of water for municipal use for the Southwestern region of the Denver metro area. The water flow that exits the Chatfield Reservoir flows out as the South Platte River and continues north through the Denver metro area. A significant quantity of the metro area's surface water derived drinking water comes from the Chatfield Reservoir and the project's corridor has one of the two feeder streams to the Chatfield Reservoir.

Economic Impact

The transportation system that is adjacent to East Plum Creek north of Castle Rock, the Plum Creek and the east leg of the Chatfield Reservoir is Colorado State Highway 85. The small residential communities of Sedalia, CO and Louviers, CO are also adjacent to East Plum Creek and Plum Creek and Colorado State Highway 85 prior to Titan Road to the north. The corridor also includes commercial, light industrial, residential, ranch land and planned residential development besides these two residential communities. Colorado State Highway 85 has recently been widened through the project's corridor and will bring opportunities for economic growth in the corridor.

Environmental Impact

Within the corridor the primary wastewater treatment process is individual anaerobic septic tanks at residential, commercial, and light industrial establishments and a facultative process (anaerobic/aerobic) in the community of Louviers. The primary wastewater effluent discharge is to groundwater from septic tank leach fields and to land application (in the case of the Louviers facultative lagoon). There exists the potential to impact the water quality of East Plum Creek and Plum Creek if these discharges were increased. This lack of wastewater treatment availability has limited the future development along the corridor and the need therefore exists to provide wastewater availability for sustainable and economic development.

Social Impact

The recreation interests and stakeholders of the community have indicated that a multi-purpose recreation trail along East Plum Creek and Plum Creek connecting the Town of Castle Rock to the south and Sterling Ranch to the north is highly desirable. Facilitating this impact is a key driver of the project.

Water Reuse Impact

In addition to the needed wastewater treatment within the corridor, water reuse is highly desirable for the present and for future use. Direct potable reuse of wastewater has recently been approved by the Colorado Department of Public Health and Environment (CDPHE) within Colorado. Although this maybe not be implemented by the project, the project does include plans to pipe the treated wastewater to the Castle Rock reservoir system for later treatment processing to derive potable water.

Water Conservation Impact

Conservation, that utilizes state of the art water fixtures and regionally adapted low water use landscaping as corridor development increases, will provide a key element for reducing the water usage footprint within the corridor's service area.

General Scope of Work

Alternative Selection

Castle Rock Water, an award winning water, wastewater and storm water utility, with expertise in project, operations and maintenance management will evaluate the various alternatives for building a wastewater collection and treatment system for the Highway 85 corridor. This evaluation will be shared with Douglas County and the most favorable alternative will be selected. There are three infrastructure alternatives under consideration at this time for the corridor.

- Alternative 1. All Force Main with two lift stations with discharge to Plum Creek Water Reclamation Authority (PCWRA).
- Alternative 2. Louviers Wastewater Treatment Plant with gravity sewers from Sedalia with discharge of treated effluent to Plum Creek and/or piping of wastewater to the Castle Rock reservoir system.
- Alternative 3. Chatfield Basin Water Reclamation Facility (CBWRF) with a lift station at Louviers and a force main from Louviers to a Sterling Ranch gravity sewer then on to the Titan Road lift station.

The plan is for Castle Rock Water to review each of the alternatives and based on cost, environmental benefits, constructability, permitting, technology feasibility, ease of implementation, differing operability, ease of schedule, regional partnerships and other factors for selecting the best alternative.

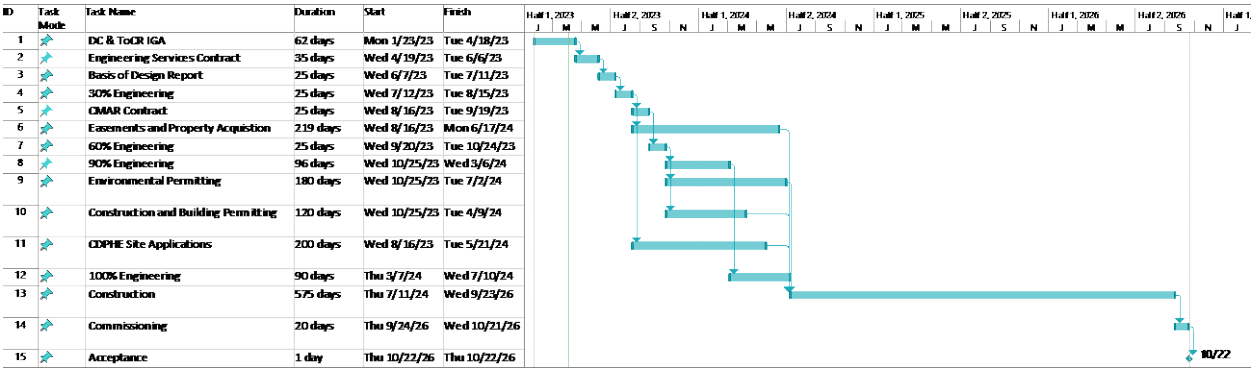
Project Management of Phase 1

The concept for phase 1 will be to construct infrastructure to provide roughly 200,000 gallons per day of average daily collection and treatment capacity in the Highway 85 corridor. After the selection of the alternative and the engineering tasks required to select the infrastructure treatment site locations, lift station(s) and pumping station(s) and pipeline routes, Castle Rock

Water will break the project down into phases as appropriate. For example, for Alternative 3, the project will be broken down into:

- Louviers Lift Station
- Louviers Force Main
- Chatfield Basin Water Reclamation Facility
- Titan Road Lift Station

Castle Rock Water will then manage all aspects of the acquisition of professional engineering and construction services for the permitting, design and construction of the infrastructure associated with the selected alternative for the Regional Wastewater Collection and Treatment Project. A work breakdown structure and Gantt style schedule will be developed with the various project components identified. An example high level schedule is provided below.



ID	Task Mode	Task Name	Duration	Start	Finish
1		DC & ToCR IGA	62 days	Mon 1/23/23	Tue 4/18/23
2		Engineering Services Contract	35 days	Wed 4/19/23	Tue 6/6/23
3		Basis of Design Report	25 days	Wed 6/7/23	Tue 7/11/23
4		30% Engineering	25 days	Wed 7/12/23	Tue 8/15/23
5		CMAR Contract	25 days	Wed 8/16/23	Tue 9/19/23
6		Easements and Property Acquistion	219 days	Wed 8/16/23	Mon 6/17/24
7		60% Engineering	25 days	Wed 9/20/23	Tue 10/24/23
8		90% Engineering	96 days	Wed 10/25/23	Wed 3/6/24
9		Environmental Permitting	180 days	Wed 10/25/23	Tue 7/2/24
10		Construction and Building Permitting	120 days	Wed 10/25/23	Tue 4/9/24
11		CDPHE Site Applications	200 days	Wed 8/16/23	Tue 5/21/24
12		100% Engineering	90 days	Thu 3/7/24	Wed 7/10/24
13		Construction	575 days	Thu 7/11/24	Wed 9/23/26
14		Commissioning	20 days	Thu 9/24/26	Wed 10/21/26
15		Acceptance	1 day	Thu 10/22/26	Thu 10/22/26

Castle Rock Water will evaluate the most appropriate project delivery methods for the various project components based on the rules of the ARPA funding, permitting, the schedule, technical aspects of the work, availability of qualified consultants and contractors, and availability of critical equipment (pumps, treatment process equipment, etc.).

RFPs for professional engineering services will be issued. Once selection is made with Douglas County's concurrence, design will begin. Castle Rock will work with Douglas County to set up the appropriate escrow accounts for each contract awarded as part of the project. As design progresses, Castle Rock will begin easement and property acquisition. Temporary easements will be obtained that are needed for the construction of the infrastructure. Easements will also be obtained for the multipurpose trail where the proposed location matches the wastewater collection piping routes. Also, as part of the design, permitting will be completed for each work phase. As designs for each phase are complete as appropriate depending on the delivery method used, construction bidding will be completed. Work will be awarded with Douglas County concurrence. Castle Rock Water will oversee construction for each phase using professional engineering services as appropriate to ensure we receive a good project.

In the initial phases of the project, Castle Rock will develop and write Requests for Proposals (RFP's) needed for acquiring the professional engineering services to accomplish the tasks of schematic design (30% engineering), the 60% engineering needed for drawings and most permits, 90% engineering for drawings, specifications and cost estimates, and 100%

engineering needed for complete construction. Castle Rock will use our standard process for engineering and construction services including our contracts and documents for obtaining design and construction services. Each component will go through approval with our Council like we do for any project over $250,000. Each component will also be brought to Douglas County for approval.

Castle Rock is planning on constructing the infrastructure using alternative delivery methods as allowed based on the ARPA funding rules. For example, Castle Rock will consider the CMAR (Construction Manager at Risk) delivery method for some components of the project. The CMAR delivery method is designed for speed of construction implementation and transparency of costs in addition to communitive and excellent collaboration between internal and external stakeholders of the project. At the 30% engineering design level, construction contractors will be solicited to submit labor, materials, overhead and profit proposals for the project which Castle Rock will oversee and evaluate with input from the professional engineering services team. The CMAR contractor will provide a Guaranteed Maximum Price Construction Management (GMPCM) contract at that time and work towards developing a Final Guaranteed Maximum Price (FGMP) contract.

Provision of Wastewater Service

Once the project infrastructure is complete, Castle Rock Water will own, operate, maintain, repair and replace the collection system infrastructure in the Highway 85 corridor and the reuse water components of the system. The wastewater treatment plant (CBWRF) will be assigned to Dominion to own, operate, maintain, repair and replace once construction is complete if Alternative 3 is selected.

Castle Rock Water will provide retail and/or wholesale wastewater service in the Service Area. In addition to operating and maintaining the system, this service will include an annual cost of service evaluation and setting of rates and fees, billing and customer service. Castle Rock will also consider providing retail water service where water supply is available and the customer would like to have that service as well as part of a more holistic retail service.

As the wastewater provider Castle Rock Water will also annually evaluate and set system development fees (SDFs) to be paid by customers connecting to the system, which fees will be different for existing development verses new development and redevelopment. For all potential customers, Castle Rock Water will determine necessary improvements, available capacity and SDFs and then provide a will serve letter if service can be provided.

Project Management of Phase 2

Castle Rock will utilize SDFs to build Phase 2 of the project in the future to allow service to be provided beyond the capacities created in Phase 1. SDF revenue will be put into a project fund. As funds accrue, Castle Rock will design, permit and construct additional infrastructure in the corridor. Ultimately, the concept will be to construct a full collection system from Titan Road Lift Station to just North of Plum Creek Water Reclamation Authority and approximately 1 million gallons per day of average daily flow treatment capacity. Past Phase 1 capacities, Castle Rock will also evaluate availability of renewable water supplies for new development and redevelopment. Confirmation of renewable water supplies will be an additional requirement in order to gain wastewater services.

EXHIBIT E

U.S. DEPARTMENT OF THE TREASURY CORONAVIRUS LOCAL FISCAL RECOVERY FUND AWARD TERMS AND CONDITIONS

1. Use of Funds.

   a. Recipient understands and agrees that the funds disbursed under this award may only be used in compliance with section 603(c) of the Social Security Act (the Act), Treasury's regulations implementing that section, and guidance issued by Treasury regarding the foregoing.

   b. Recipient will determine prior to engaging in any project using this assistance that it has the institutional, managerial, and financial capability to ensure proper planning, management, and completion of such project.

2. Period of Performance. The period of performance for this award begins on the date hereof and ends on December 31, 2026. As set forth in Treasury's implementing regulations, Recipient may use award funds to cover eligible costs incurred during the period that begins on March 3, 2021, and ends on December 31, 2024.

3. Reporting. Recipient agrees to comply with any reporting obligations established by Treasury as they relate to this award.

4. Maintenance of and Access to Records.

   a. Recipient shall maintain records and financial documents sufficient to evidence compliance with section 603(c) of the Act, Treasury's regulations implementing that section, and guidance issued by Treasury regarding the foregoing.

   b. The Treasury Office of Inspector General and the Government Accountability Office, or their authorized representatives, shall have the right of access to records (electronic and otherwise) of Recipient in order to conduct audits or other investigations.

   c. Records shall be maintained by Recipient for a period of five (5) years after all funds have been expended or returned to Treasury, whichever is later.

5. Pre-award Costs. Pre-award costs, as defined in 2 C.F.R. § 200.458, may not be paid with funding from this award.

6. Administrative Costs. Recipient may use funds provided under this award to cover both direct and indirect costs.

7. Cost Sharing. Cost sharing or matching funds are not required to be provided by Recipient.

8. Conflicts of Interest. Recipient understands and agrees it must maintain a conflict of interest policy consistent with 2 C.F.R. § 200.318(c) and that such conflict of interest policy is applicable to each activity funded under this award. Recipient and subrecipients must disclose in writing to Treasury or the pass-through entity, as appropriate, any potential conflict of interest affecting the awarded funds in accordance with 2 C.F.R. § 200.112.

9. Compliance with Applicable Law and Regulations.

a. Recipient agrees to comply with the requirements of section 602 of the Act, regulations adopted by Treasury pursuant to section 602(f) of the Act, and guidance issued by Treasury regarding the foregoing. Recipient also agrees to comply with all other applicable federal statutes, regulations, and executive orders, and Recipient shall provide for such compliance by other parties in any agreements it enters into with other parties relating to this award.

b. Federal regulations applicable to this award include, without limitation, the following:

i. Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, 2 C.F.R. Part 200, other than such provisions as Treasury may determine are inapplicable to this Award and subject to such exceptions as may be otherwise provided by Treasury. Subpart F – Audit Requirements of the Uniform Guidance, implementing the Single Audit Act, shall apply to this award.

ii. Universal Identifier and System for Award Management (SAM), 2 C.F.R. Part 25, pursuant to which the award term set forth in Appendix A to 2 C.F.R. Part 25 is hereby incorporated by reference.

iii. Reporting Subaward and Executive Compensation Information, 2 C.F.R. Part 170, pursuant to which the award term set forth in Appendix A to 2 C.F.R. Part 170 is hereby incorporated by reference.

iv. OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement), 2 C.F.R. Part 180, including the requirement to include a term or condition in all lower tier covered transactions (contracts and subcontracts described in 2 C.F.R. Part 180, subpart B) that the award is subject to 2 C.F.R. Part 180 and Treasury's implementing regulation at 31 C.F.R. Part 19.

v. Recipient Integrity and Performance Matters, pursuant to which the award term set forth in 2 C.F.R. Part 200, Appendix XII to Part 200 is hereby incorporated by reference.

vi. Governmentwide Requirements for Drug-Free Workplace, 31 C.F.R. Part 20.

vii. New Restrictions on Lobbying, 31 C.F.R. Part 21.

viii. Uniform Relocation Assistance and Real Property Acquisitions Act of 1970 (42 U.S.C. §§ 4601-4655) and implementing regulations.

ix. Generally applicable federal environmental laws and regulations.

c. Statutes and regulations prohibiting discrimination applicable to this award include, without limitation, the following:

i. Title VI of the Civil Rights Act of 1964 (42 U.S.C. §§ 2000d et seq.) and Treasury's implementing regulations at 31 C.F.R. Part 22, which prohibit discrimination on the basis of race, color, or national origin under programs or activities receiving federal financial assistance;

ii. The Fair Housing Act, Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§ 3601 et seq.), which prohibits discrimination in housing on the basis of race, color, religion, national origin, sex, familial status, or disability;

iii. Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794), which prohibits discrimination on the basis of disability under any program or activity receiving federal financial assistance;

iv. The Age Discrimination Act of 1975, as amended (42 U.S.C. §§ 6101 et seq.), and Treasury's implementing regulations at 31 C.F.R. Part 23, which prohibit discrimination on the basis of age in programs or activities receiving federal financial assistance; and

v. Title II of the Americans with Disabilities Act of 1990, as amended (42 U.S.C. §§ 12101 et seq.), which prohibits discrimination on the basis of disability under programs, activities, and services provided or made available by state and local governments or instrumentalities or agencies thereto.

10. Remedial Actions. In the event of Recipient's noncompliance with section 602 of the Act, other applicable laws, Treasury's implementing regulations, guidance, or any reporting or other program requirements, Treasury may impose additional conditions on the receipt of a subsequent tranche of future award funds, if any, or take other available remedies as set forth in 2 C.F.R. § 200.339. In the case of a violation of section 602(c) of the Act regarding the use of funds, previous payments shall be subject to recoupment as provided in section 602(e) of the Act and any additional payments may be subject to withholding as provided in sections 602(b)(6)(A)(ii)(III) of the Act, as applicable.

11. Hatch Act. Recipient agrees to comply, as applicable, with requirements of the Hatch Act (5 U.S.C. §§ 1501-1508 and 7324-7328), which limit certain political activities of State or

local government employees whose principal employment is in connection with an activity financed in whole or in part by this federal assistance.

12. False Statements. Recipient understands that making false statements or claims in connection with this award is a violation of federal law and may result in criminal, civil, or administrative sanctions, including fines, imprisonment, civil damages and penalties, debarment from participating in federal awards or contracts, and/or any other remedy available by law.

13. Publications. Any publications produced with funds from this award must display the following language: "This project [is being] [was] supported, in whole or in part, by federal award number [enter project FAIN] awarded to [name of Recipient] by the U.S. Department of the Treasury."

14. Debts Owed the Federal Government.

    a. Any funds paid to Recipient (1) in excess of the amount to which Recipient is finally determined to be authorized to retain under the terms of this award; (2) that are determined by the Treasury Office of Inspector General to have been misused; or (3) that are determined by Treasury to be subject to a repayment obligation pursuant to sections 602(e) and 603(b)(2)(D) of the Act and have not been repaid by Recipient shall constitute a debt to the federal government.

    b. Any debts determined to be owed the federal government must be paid promptly by Recipient. A debt is delinquent if it has not been paid by the date specified in Treasury's initial written demand for payment, unless other satisfactory arrangements have been made or if the Recipient knowingly or improperly retains funds that are a debt as defined in paragraph 14(a). Treasury will take any actions available to it to collect such a debt.

15. Disclaimer.

    a. The United States expressly disclaims any and all responsibility or liability to Recipient or third persons for the actions of Recipient or third persons resulting in death, bodily injury, property damages, or any other losses resulting in any way from the performance of this award or any other losses resulting in any way from the performance of this award or any contract, or subcontract under this award.

    b. The acceptance of this award by Recipient does not in any way establish an agency relationship between the United States and Recipient.

16. Protections for Whistleblowers.

    a. In accordance with 41 U.S.C. § 4712, Recipient may not discharge, demote, or otherwise discriminate against an employee in reprisal for disclosing to any of the list of persons or entities provided below, information that the employee reasonably

believes is evidence of gross mismanagement of a federal contract or grant, a gross waste of federal funds, an abuse of authority relating to a federal contract or grant, a substantial and specific danger to public health or safety, or a violation of law, rule, or regulation related to a federal contract (including the competition for or negotiation of a contract) or grant.

b. The list of persons and entities referenced in the paragraph above includes the following:

i. A member of Congress or a representative of a committee of Congress;

ii. An Inspector General;

iii. The Government Accountability Office;

iv. A Treasury employee responsible for contract or grant oversight or management;

v. An authorized official of the Department of Justice or other law enforcement agency;

vi. A court or grand jury; or

vii. A management official or other employee of Recipient, contractor, or subcontractor who has the responsibility to investigate, discover, or address misconduct.

c. Recipient shall inform its employees in writing of the rights and remedies provided under this section, in the predominant native language of the workforce.

17. Increasing Seat Belt Use in the United States. Pursuant to Executive Order 13043, 62 FR 19217 (Apr. 18, 1997), Recipient should encourage its contractors to adopt and enforce on-the-job seat belt policies and programs for their employees when operating company-owned, rented or personally owned vehicles.

18. Reducing Text Messaging While Driving. Pursuant to Executive Order 13513, 74 FR 51225 (Oct. 6, 2009), Recipient should encourage its employees, subrecipients, and contractors to adopt and enforce policies that ban text messaging while driving, and Recipient should establish workplace safety policies to decrease accidents caused by distracted drivers.

ASSURANCES OF COMPLIANCE WITH TITLE VI OF THE CIVIL RIGHTS ACT OF 1964

As a condition of receipt of federal financial assistance from the Department of the Treasury, the recipient named below (hereinafter referred to as the "Recipient") provides the assurances stated herein. The federal financial assistance may include federal grants, loans and contracts to provide assistance to the Recipient's beneficiaries, the use or rent of Federal land or property at below market value, Federal training, a loan of Federal personnel, subsidies, and other arrangements with the intention of providing assistance. Federal financial assistance does not encompass contracts of guarantee or insurance, regulated programs, licenses, procurement contracts by the Federal government at market value, or programs that provide direct benefits.

The assurances apply to all federal financial assistance from or funds made available through the Department of the Treasury, including any assistance that the Recipient may request in the future.

The Civil Rights Restoration Act of 1987 provides that the provisions of the assurances apply to all of the operations of the Recipient's program(s) and activity(ies), so long as any portion of the Recipient's program(s) or activity(ies) is federally assisted in the manner prescribed above.

1. Recipient ensures its current and future compliance with Title VI of the Civil Rights Act of 1964, as amended, which prohibits exclusion from participation, denial of the benefits of, or subjection to discrimination under programs and activities receiving federal financial assistance, of any person in the United States on the ground of race, color, or national origin (42 U.S.C. § 2000d et seq.), as implemented by the Department of the Treasury Title VI regulations at 31 CFR Part 22 and other pertinent executive orders such as Executive Order 13166, directives, circulars, policies, memoranda, and/or guidance documents.

2. Recipient acknowledges that Executive Order 13166, "Improving Access to Services for Persons with Limited English Proficiency," seeks to improve access to federally assisted programs and activities for individuals who, because of national origin, have Limited English proficiency (LEP). Recipient understands that denying a person access to its programs, services, and activities because of LEP is a form of national origin discrimination prohibited under Title VI of the Civil Rights Act of 1964 and the Department of the Treasury's implementing regulations. Accordingly, Recipient shall initiate reasonable steps, or comply with the Department of the Treasury's directives, to ensure that LEP persons have meaningful access to its programs, services, and activities. Recipient understands and agrees that meaningful access may entail providing language assistance services, including oral interpretation and written translation where necessary, to ensure effective communication in the Recipient's programs, services, and activities.

3. Recipient agrees to consider the need for language services for LEP persons when Recipient develops applicable budgets and conducts programs, services, and activities. As a resource, the Department of the Treasury has published its LEP guidance at 70 FR 6067. For more information on taking reasonable steps to provide meaningful access for LEP persons, please visit http://www.lep.gov.

4. Recipient acknowledges and agrees that compliance with the assurances constitutes a condition of continued receipt of federal financial assistance and is binding upon Recipient and Recipient's successors, transferees, and assignees for the period in which such assistance is provided.

5. Recipient acknowledges and agrees that it must require any sub-grantees, contractors, subcontractors, successors, transferees, and assignees to comply with assurances 1-4 above, and agrees to incorporate the following language in every contract or agreement subject to Title VI and its regulations between the Recipient and the Recipient's sub-grantees, contractors, subcontractors, successors, transferees, and assignees:

> *The sub-grantee, contractor, subcontractor, successor, transferee, and assignee shall comply with Title VI of the Civil Rights Act of 1964, which prohibits recipients of federal financial assistance from excluding from a program or activity, denying benefits of, or otherwise discriminating against a person on the basis of race, color, or national origin (42 U.S.C. § 2000d et seq.), as implemented by the Department of the Treasury's Title VI regulations, 31 CFR Part 22, which are herein incorporated by reference and made a part of this contract (or agreement). Title VI also includes protection to persons with "Limited English Proficiency" in any program or activity receiving federal financial assistance, 42 U.S.C. § 2000d et seq., as implemented by the Department of the Treasury's Title VI regulations, 31 CFR Part 22, and herein incorporated by reference and made a part of this contract or agreement.*

6. Recipient understands and agrees that if any real property or structure is provided or improved with the aid of federal financial assistance by the Department of the Treasury, this assurance obligates the Recipient, or in the case of a subsequent transfer, the transferee, for the period during which the real property or structure is used for a purpose for which the federal financial assistance is extended or for another purpose involving the provision of similar services or benefits. If any personal property is provided, this assurance obligates the Recipient for the period during which it retains ownership or possession of the property.

7. Recipient shall cooperate in any enforcement or compliance review activities by the Department of the Treasury of the aforementioned obligations. Enforcement may include investigation, arbitration, mediation, litigation, and monitoring of any settlement agreements that may result from these actions. The Recipient shall comply with information requests, on-site compliance reviews and reporting requirements.

8. Recipient shall maintain a complaint log and inform the Department of the Treasury of any complaints of discrimination on the grounds of race, color, or national origin, and limited English proficiency covered by Title VI of the Civil Rights Act of 1964 and implementing regulations and provide, upon request, a list of all such reviews or proceedings based on the complaint, pending or completed, including outcome. Recipient also must inform the Department of the Treasury if Recipient has received no complaints under Title VI.

9. Recipient must provide documentation of an administrative agency's or court's findings of non-compliance of Title VI and efforts to address the non-compliance, including any voluntary compliance or other agreements between the Recipient and the administrative agency that made the finding. If the Recipient settles a case or matter alleging such discrimination, the Recipient must provide documentation of the settlement. If Recipient has not been the subject of any court or administrative agency finding of discrimination, please so state.

10. If the Recipient makes sub-awards to other agencies or other entities, the Recipient is responsible for ensuring that sub-recipients also comply with Title VI and other applicable authorities covered in this document State agencies that make sub-awards must have in place standard grant assurances and review procedures to demonstrate that that they are effectively monitoring the civil rights compliance of subrecipients.

The United States of America has the right to seek judicial enforcement of the terms of this assurances document and nothing in this document alters or limits the federal enforcement measures that the United States may take in order to address violations of this document or applicable federal law.

Under penalty of perjury, the undersigned official(s) certifies that official(s) has read and understood the Recipient's obligations as herein described, that any information submitted in conjunction with this assurances document is accurate and complete, and that the Recipient is in compliance with the aforementioned nondiscrimination requirements.

Titan Rd

Plum Creek Water Reclamation Authority

Timber Mill Parkway

Meadows Boulevard

Town of Castle Rock

Front Street

Highway 85

Founders Parkway

25

85

Service Area

0 0.5 1 2 Miles

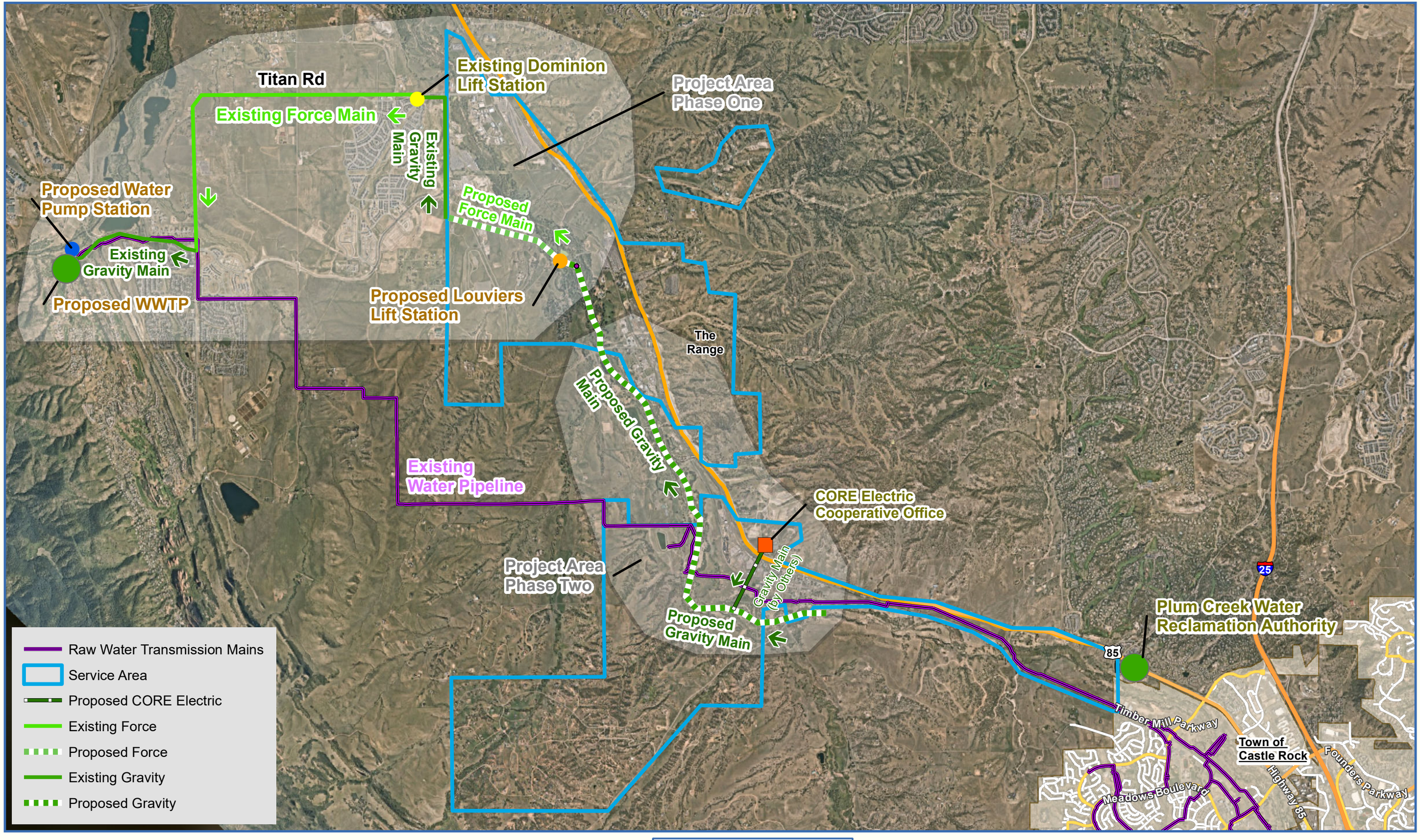
1 inch = 4,500 feet

Disclaimer: The data presented has been compiled from various sources, each of which introduces varying degrees of inaccuracies or inconsistencies. Such discrepancies in data are inherent and in supplying this product the Town of Castle Rock assumes no liability for it's use or accuracy. Questions or comments regarding the cartographic composition of this map including, but not limited to, errors, omissions, corrections, and/or updates, should be directed to the Utilities Department, Town of Castle Rock, (720) 733-6056. Copyright 2023, Town of Castle Rock Utilities Mapping.

Document Path: J:\B. PLAN & ENG\11.0 CIP\11.9. Projects\WW Fund\Regional Wastewater\GIS\Boundary_Exhibit_A.mxd

Date: 4/21/2023

Exhibit A -
Highway 85 Wastewater Collection and Treatment System Service Area



CASTLE ROCK Qwater
Securing our future drop by drop

0 0.5 1 2 Miles

1 inch = 4,500 feet

N

Disclaimer: The data presented has been compiled from various sources, each of which introduces varying degrees of inaccuracies or inconsistencies. Such discrepancies in data are inherent and in supplying this product the Town of Castle Rock assumes no liability for it's use or accuracy. Questions or comments regarding the cartographic composition of this map including, but not limited to, errors, omissions, corrections, and/or updates, should be directed to the Utilities Department, Town of Castle Rock, (720) 733-6056. Copyright 2023, Town of Castle Rock Utilities Mapping.

Exhibit B-1
Project Infrastructure
Alternative 3

Document Path: J:\B. PLAN & ENG\11.0 CIP\11.9. Projects\WW Fund\Regional Wastewater\GIS\Exhibit_B_Alt3_3_31.mxd

Date: 3/31/2023

Dominion Water & Sanitation District
9250 E. Costilla Ave, Suite 400
Greenwood Village, CO 80112

E-85 WASTEWATER INTERGOVERNMENTAL AGREEMENT

THE TOWN OF CASTLE ROCK ACTING THROUGH ITS WATER ENTERPRISE AND DOMINION WATER & SANITATION DISTRICT ACTING THROUGH ITS STERLING RANCH WATER AND WASTEWATER ACTIVITY ENTERPRISE

April 19, 2023

Mark Marlowe
Director, Castle Rock Water

Dear Mark:

This Term Sheet is intended to highlight and summarize the major deal points that would form the basis of a more definitive E-85 Wastewater Intergovernmental Agreement ("E-85 Wastewater IGA") between Dominion Water & Sanitation District ("Dominion") and the Town of Castle Rock acting through its Water Enterprise ("Castle Rock") (collectively, the ("Parties").

The E-85 Wastewater IGA would detail how Dominion and Castle Rock would partner to make 0.2 MGD (average daily flow or annual average flow) of wastewater conveyance and treatment capacity available to Castle Rock and Douglas County for existing and future service along the E-85 corridor. The E-85 Wastewater IGA will provide design and construction of 0.2 MGD (average daily flow or annual average flow) of wastewater conveyance infrastructure to Dominion's system and capacity in Dominion's and the Sterling Ranch Community Authority Board's (the "CAB") collection system, along with the construction of a new mutually beneficial wastewater treatment plant (the "Chatfield Basin Reclamation Facility/CBWRF") (collectively, the "Project"). At no time will peaking capacity associated with the reserved County Capacity exceed 0.2 MGD which is the total available peaking capacity in the Roxborough South Platte Renew (SPR) system until such time necessary infrastructure has been designed and constructed to allow for the full 0.2 MGD of average daily flow including peaking requirements. All facility capacities referenced in this document are average daily flow / annual average flow and will be designed in accordance with appropriate maximum month flow, peak hour flow and peak instantaneous flow or other parameters as required in the Water Quality Control Division design criteria. The lift station(s), force main(s), and Plant (as defined below) will be designed to accommodate potential future expansion by Dominion or Castle Rock.

The Parties mutually agree that there is benefit to Castle Rock and Dominion in entering into this Term Sheet and subsequent E-85 Wastewater IGA. Castle Rock, will be reserving 0.2 MGD capacity (average daily flow or annual average flow) (the "County Capacity") in the Project for those existing residents on the E-85 corridor (Service Area see Exhibit A), defined as fully developed property as of January 1, 2023, new development in the Service

Area and redevelopment in the Service Area.

Castle Rock will have the right to purchase return flows from the communities of Louviers (if not previously acquired by Castle Rock), Sedalia and have the right of first option to purchase additional return flows from Dominion if Dominion ever elects to sell return flows (for the avoidance of doubt, Dominion using return flows for service of Dominion customers shall not constitute selling return flows). In addition, Castle Rock and Dominion will mutually own and operate a pumping facility to be located on the CBWRF, based on design and site layout constraints, for use to discharge return flows to Castle Rock Reservoir Numbers 1 and/or 2 (the "CRR1", "CRR2") to the Larry Moore Water Treatment Plant (the "Moore WTP") or a future location. The pumping facility will be designed and constructed such that it can be expanded in the future for use by both Dominion and Castle Rock for flows from the S. Platte River to include surface water rights, return flows, and storage rights in Chatfield Reservoir. Dominion will own, operate and maintain the CBWRF which will be jointly designed and constructed to allow for expansion to the full build out capacity to be determined by Dominion with input from Castle Rock.

The following intends to describe the Project and key components that will be used to form the E-85 Wastewater IGA. A general depiction of this Project is attached to this term sheet as Exhibit "B". The Parties agree that components of the Project may extend beyond the December 31, 2026 timeline, however all American Rescue Plan Act ("ARPA") funds will be expended in accordance with the deadlines required by the Federal government as interpreted by Douglas County.

Louviers Lift Station and Force Main:

1. Castle Rock will acquire easements, design, and construct a 0.2 MGD lift station, expandable to 1.0 MGD, and accompanying forcemain (the "Louviers Lift Station and forcemain"). The lift station will be located at or near the existing Louviers sewer lagoon and the forcemain will connect to the CAB collection system at the Moore and Waterton Road intersection. All plans and design will conform to the Water Quality Control Division's, Castle Rock Water's and Dominion's adopted Engineering Standards and Rules and Regulations, and Dominion will have review and approval rights over the design and construction plans, which approval will not be unreasonably withheld. The lift station will be owned and operated by Castle Rock. The forcemain to include easements, will be owned and operated by Dominion.
2. The Louviers Lift Station and force main will initially tie into an 8" gravity sewer line located at Waterton Road and Moore Road that is owned by the CAB.
3. The CAB will make available to Castle Rock and Douglas County the County Capacity within its gravity sewer collection system and any needed upgrades to get to the 0.2 MGD average day flow capacity at no cost (except for potential inclusion into future system development fees as noted below) with a tie in location at the Moore and Waterton Road and continuing to the existing Titan Road Lift Station, owned by Dominion. The total

amount of available average day flow capacity and peak day capacity in this CAB line will be identified early in engineering and County Capacity will be limited to those values until upgrades are completed for additional capacity using system development fees from new development or redevelopment or ARPA funds as they are available. A future alignment for a forcemain along Moore Road to tie directly into the Titan Road Lift Station will be designed as funding allows to provide for additional capacity, see subsequent sections. At no time will wastewater flows in exceedance of the capacity CAB makes available and which is verified in the early engineering in the CAB line be exceeded.

Titan Road Lift Station, 12" Forcemain and O-Line:

1. Dominion will make available the County Capacity in its Titan Road Lift Station, 12" forcemain located between the Titan Road Lift Station and the Roxborough Water & Sanitation District ("Roxborough") O-Line connection point, and the O-Line gravity sewer at no cost (except for potential inclusion into future system development fees as noted below) to those using the County Capacity. The total amount of available average day flow capacity and peak day capacity in the pumps in the Titan Road Lift Station will be identified early in engineering and County Capacity will be limited to those values until upgrades are completed for additional capacity using system development fees from new development or redevelopment or ARPA funds as they are available. The 12" forcemain and O-Line gravity sewer have adequate capacity to provide for the 0.2 MGD of average day flow including any peaks. Additional capacity at the Titan Road Lift Station, the forcemain, and the O-Line gravity sewer may be purchased by Castle Rock for future users along the corridor in accordance with Dominion's Rules and Regulations. Dominion will provide planning level estimates of what this additional capacity may cost.

Dominion Wastewater Treatment Plant:

1. The Parties agree that if the rules of the ARPA funding allow, an alternative delivery approach will be considered to deliver the CBWRF construction project. Castle Rock and Dominion will jointly contract for the design of the CBWRF using Carollo. If an alternative delivery approach is allowed under the ARPA funding, design will be advanced to a sufficient level, to be mutually agreed upon by the Parties, to then bring on a Construction Manager at Risk ("CMAR") to be contracted and managed by Castle Rock. Funding for the CBWRF construction may be from a combination of ARPA funds, in-kind contributions from Dominion and funds from Dominion's

Sterling Ranch Wastewater Enterprise Fund. The share of funding will be based on the percentage of the County Capacity and the final capacity of the CBWRF to be recommended by Carollo and mutually agreed upon by the Parties. The CBWRF will be designed to be expandable such that Dominion can continue to operate the plant and construct the plant for full build out in the future.

2. The CBWRF will be able to use Dominion's existing discharge point with a new CDPHE Discharge permit and a proportionate share of the 2,000 lbs. of phosphorous allocation in Chatfield Reservoir.
3. The Parties will work collaboratively and provide reasonable review and approval rights as the design advances. No Party will unreasonably withhold approval to advance the design of the CBWRF.
4. Dominion will be provided reasonable review and approval rights for the CMAR.
5. Dominion will process the applicable CDPHE permits for the new Plant under Dominion's name with Castle Rock's participation and cooperation. A permitting strategy will be mutually agreed on by the parties. Castle Rock will maintain sole discretion over when and whether treated effluent can be discharged to CRR1/CRR2 once a permit has been received for this discharge. This is to protect in case our advanced treatment plant is down or some other issue arises where Castle Rock does not want the reuse water in our drinking water reservoirs. This means the discharge to the South Platte or to Roxborough's lift station and force main must be in place before the system can start receiving wastewater. Castle Rock will pay the design and permitting costs as part of its ARPA funding. Discharge permitting for the Plant is a priority. Dominion and Castle Rock will work together towards getting both permits as quickly as possible so as to provide at least one discharge point for the plant in the shortest possible timeframe. The Parties will mutually agree on a strategy for permitting and potential additional costs for treatment due to anticipated more stringent discharge parameters due to CDPHE regulations, associated with discharging water to CRR2 and/or CRR1. In the interim, Dominion will maintain adequate capacity in the current Roxborough discharge lift station to South Platte Renew ("SPR") to allow for the wastewater system to proceed to construction and connect customers. For the avoidance of doubt, Dominion will make available capacity to near-term users along the E-85 corridor including Louviers Water and Sanitation District, the Range, and CORE until the plant is completed in Dominion's

capacity to deliver wastewater to SPR that is managed based on peaking. If the plant completion is delayed or the peaking capacity exceeds Dominion's capacity within the delivery system to SPR, the parties will meet to discuss and identify solutions such that any capacity along the E-85 corridor does not impair Dominion's service to CAB. Dominion has sole authority to determine if that capacity is exceeded and Dominion would be in breach of said contracts.

6. There will be at least two discharge points, for the intention of capturing return flows, incorporated into the design including one to the S. Platte River and one to CRR1/CRR2.
7. A pump station will be required at the CBWRF to move effluent to the delivery point at CRR2/CRR1, the Moore WTP, or future location to be owned by Dominion, to effectively capture all return flows that can be delivered and used for reuse water by the Parties. The pump station will be jointly owned and operated by the Parties. Dominion will provide a site for the pump station based on the design and site layout for the full build out of the CBWRF. The pump station will be designed and constructed such that future expansion for use by Dominion and Castle Rock can be accomplished cost effectively. Future capacity will include S. Platte River water rights, return flows and storage rights in Chatfield Reservoir.
8. Dominion will have the right to use the full capacity of the CBWRF unless and until the County Capacity is on-line and wastewater flows are being conveyed to the CBWRF. In no event, will Castle Rock give Dominion less than 12 months' notice to anticipate cessation of using the County's capacity for new development or redevelopment based upon realized flows. Existing customers (fully developed property as of January 1, 2023) will be able to access the County Capacity when they are connected with seven days' notice to allow for Dominion to complete any operational modifications to allow for effective conveyance of wastewater flows to the CBWRF. This notice is not intended to prohibit connection and said connection will not be denied by Dominion.
9. After construction of the CBWRF, title and ownership of the CBWRF will be conveyed to Dominion. The County Capacity will be reserved and administered by Castle Rock
10. Dominion will determine the wastewater rates for the Plant operations and the rates that will be charged to Castle Rock. These rates will be in addition to Castle Rock's rates and fees, to include extra-territorial charges, for County users along the E-85 Corridor. All rates and fees will be based upon a rate study which will include a cost of service analysis. Castle Rock and

Dominion agree to pursue a transition period for rates to serve existing development as of January 1, 2023 versus new development along the corridor with an appropriate transition period for existing development. Dominion and Castle Rock agree that rates and fees will be updated on an annual basis in accordance with a rate study which will include a cost of service analysis, with notice of any increase in rates and fees provided to all of Dominion's wholesale customers, to include Castle Rock and CAB. Notice of the annual rate setting process will be provided by Dominion when the process is initiated.

New users that exceed the County Capacity may request service from Castle Rock who may agree to serve, existing development, new development or redevelopment subject to: 1. Satisfaction of Dominion's and Castle Rock's Rules and Regulations, 2. Satisfaction of Dominion's and Castle Rock's Terms of Service, 3. Payment of any system development fees identified by Castle Rock and Dominion as necessary for service, 4. Completion of any Necessary Improvements identified by Castle Rock and Dominion where those improvements impact Dominion's infrastructure 5. Any new development's or redevelopment's source of water is renewable water as determined by the Parties (which for the avoidance of doubt, re-used effluent with an influent groundwater source will not be considered renewable water), 6. Capacity can be made available in all aspects of the wastewater infrastructure including meeting regulatory limits and providing for phosphorus allocations, 7. These provisions can be updated at any time subject only to agreement of both Parties. In the event that Castle Rock and Dominion can serve new development or redevelopment beyond the County Capacity, along the corridor, rates and fees shall be determined by the Parties using the same basic methods as for existing customers using the system.. Initial estimated sewer treatment costs will be co-developed by Dominion and Castle Rock during construction of the plant. These estimated treatment costs will be shared with Douglas County during the construction of the CBWRF.

In addition, Dominion and CAB will provide an analysis of the existing system capacity that has been contributed in their respective systems for the purposes of determining the in-kind contribution towards the E-85 wastewater project. Said in-kind contribution may be charged to new development as part of Castle Rock's system development fees as determined by the Parties. Additional costs to design and construct additional capacity in the CBWRF may be paid through Dominion's Sterling Ranch Wastewater Enterprise Fund based on identification of the additional cost beyond the construction of the CBWRF and County Capacity. The determination to agree and fund those costs are solely in the discretion of the Dominion Board.

11. Dominion will maintain adequate capacity in the Roxborough lift station and SPR to use this system for emergency conditions, and the discharge, handling and treatment of solids generated at the CBWRF. Said capacity within this system is based on peak flows, in no circumstance should flows exceed peak capacity within the system. Should in the future regulations change and SPR no longer agrees to take, handle and treat solids in a financially acceptable manner Dominion will advance plans for future solids handling and treatment at the CBWRF in cooperation with Castle Rock.

Wastewater System Development Fees:

In return for the ARPA funding, Castle Rock and the County will have pre-purchased system development fees (tap fees) for the County Capacity. The parties agree to use the system, and such usage will be subject to Castle Rock's and Dominion's Rules and Regulations regarding operation of the system, but all system development fees for the County Capacity will have been already deemed paid for by the ARPA funding. Castle Rock will set the system development fees for the County Capacity for new development and redevelopment in the Service Area based off of the cost of the system developed for the County Capacity which may include some portion of the in-kind contribution by CAB and Dominion in their system as determined by the Parties. Castle Rock will not charge system development fees for the County Capacity for development existing in the Service Area as of January 1, 2023. For development existing in the Service Area as of January 1, 2023 which connects after the County Capacity has been used, Castle Rock and Dominion will set system development fees based on the availability of capacity and a rate study which will include a cost of service analysis. Dominion will rely on its Rules and Regulations for development of system development fees in Dominion infrastructure for customers in the corridor over and beyond the initial County Capacity. Dominion will provide Castle Rock with planning level estimates of these system development fees. Castle Rock will use Dominion's system development fees as part of an overall system development fee for customers in the service area that request and are approved by the Parties for service. Castle Rock will develop system development fees for assets not owned by Dominion and add an extraterritorial surcharge and create an overall fee. The Parties understand that the County and the parties will waive system development fees for the County Capacity for existing fully developed property as of January 1, 2023. For new development or redevelopment, the parties understand that the County will support the parties charging system development fees to support improvements and expansions of infrastructure and to payback

existing investments in the infrastructure by the Parties. The Parties will agree to serve new development or redevelopment and allow them to connect to the system where the developer agrees to pay the full system development fees and make any improvements to infrastructure that Castle Rock identifies, in collaboration with Dominion should connection impact Dominion's existing facilities or ability to effectively convey or treat wastewater in the future, as required for connection for the County Capacity. The parties understand and agree that system development fees for new development or redevelopment connected under the County Capacity may be different than system development fees for new development or redevelopment beyond the initial County Capacity. In addition, for new development and redevelopment tying on after the County Capacity said development will be required to have renewable water supply as determined by the Parties.

Return Flows:

In the event Dominion is the wholesale water provider to a District / Provider along the E-85 Corridor, Dominion shall own and retain all return flows for its use. If Dominion is not the provider of water services, Castle Rock shall retain the return flows as a condition of service to County users. Dominion will agree to sell Castle Rock at a price negotiated by the parties for the return flows from Sedalia and Louviers (if not already purchased by Castle Rock) if Dominion provides water services to those retail providers. Dominion will give Castle Rock a Right of First Offer if Dominion ever elects to sell its return flows to other retail water providers (for the avoidance of doubt, Dominion using return flows to provide service to retail users does not constitute selling return flows).

Until Dominion builds its South Platte Diversion, and as capacity in Castle Rock's system is available, and in Castle Rock's sole discretion, Castle Rock will be willing to provide treated reuse water back to Dominion at a cost to be developed based on a reasonable cost of service plus extraterritorial charges.

Castle Rock will provide Dominion with the opportunity to purchase capacity in the Ravenna line that will be used to convey return flows for reuse within Douglas County to CRR2/CRR1. If Dominion purchases capacity in the Ravenna line, Castle Rock will work with Dominion to identify a future connection point to the Ravenna line that works from an engineering standpoint that will take Dominion's reuse water to the Moore WTP or other future location determined by Dominion, said infrastructure beyond the connection point to be owned by Dominion. Castle Rock will maintain ownership of the Ravenna line and will also use capacity to convey return flows to CRR2 and/or CRR1.

ARPA Funding:

This term sheet is conditioned upon the Board of County Commissioners of the County allocating a minimum of $26.8 million of ARPA funding towards a wastewater solution along the E-85 Corridor. The $26.8 million will fund the Project as outlined in this Term Sheet and to be codified in the E-85 Wastewater IGA between the Parties. Castle Rock will control the funds and fund invoices for the project, prepare a budget, and Dominion will have the right to review and approve the project budget which approval shall not be unreasonably withheld. Dominion may agree to pay Castle Rock to increase the size of the CBWRF in Dominion's sole discretion. These payments will be based on the project budget and projected spend for the CBWRF and the capacity ratios between the parties in the CBWRF's first phase.

Plant Operations:

Dominion will apply for a permit from CDPHE to discharge treated effluent to the South Platte River. Dominion will operate the system such that water can be delivered to CRR1 and/or CRR2. The Parties will design the plant with the design engineer to meet the effluent standards imposed by CDPHE. Dominion will operate the Plant to meet those permitted requirements. Dominion will consider contracting plant operations to Plum Creek Water Reclamation Authority or Castle Rock Water.

South Platte Diversion:

Castle Rock will support Dominion's permitting process for a diversion structure on the South Platte River. Castle Rock will be given the opportunity but is in no way required to fully partner with Dominion in the design, construction and capacity of the diversion. In the future and if Castle Rock does not partner with Dominion in the diversion, Dominion will have the option, in its sole discretion, to deliver Castle Rock's portion of the effluent either directly from the Plant or off of Dominion's South Platte Diversion.

Additional Components of the Project to be completed as funding allows:

System Development Fees from new development and redevelopment that are paid for as part of the County Capacity will be used to help fund construction of the following project components in order of priority:

1. Design and construction of a minimum of 0.4 MGD of reuse water pump station if not already constructed with the ARPA funding.
2. If it is estimated at any point that actual wastewater flows may approach or exceed the actual capacities that Dominion has provided in the CAB gravity sewer line or the Titan Road Lift Station, then

additional capacity up to the full 0.2 MGD of average daily flow (including the associated peaking needs) will be designed and constructed as the next priority after the water pump station in 1.

3. Design and easement acquisition for the gravity sewer main running south past Sedalia as approximately shown in the original Diamondback studies.
4. Construction of the gravity sewer main running south past Sedalia as approximately shown in the original Diamondback studies.
5. Expansion in capacity in the CBWRF.
6. Preliminary design for future construction, if warranted, to connect the Louviers lift station force main directly to the Titan Road lift station. Easements will also be acquired for this forcemain alignment along Moore Road. If this line is the answer used to address capacity issues in the CAB gravity line to get to the full 0.2 MGD of average day flow capacity, then this item would move to item 2.
7. Preliminary design of an expansion to the Titan Road Lift Station to be constructed in the future as warranted. If this item is needed to get to 0.2 MGD of average day flow (to include associated peaking) for the County Capacity, then this item will move to item number two.

Order of Priority for ARPA Funding:

The parties agree that the order of priority for funding for the ARPA funds will be as follows: design and construction of Louviers Lift Station 0.2 MGD capacity, design and construction of force main from Louviers Lift Station to CAB collection system, design and construction of the site improvements (demolition, grading, major piping, electrical to allow full build out of the plant) for up to 0.8 MGD of the CBWRF, design of up to 0.8 MGD of full treatment capacity in the CBWRF, construction of 0.4 MGD of full treatment capacity (with final sizing dependent on availability of phasing of capacity, value of in kind contributions from Dominion and availability of funds), design and construction of a minimum of 0.4 MGD of reuse water pump station, design and construction of peaking treatment and conveyance capacity associated with the County Capacity in the CAB gravity sewer and the Titan Road Lift Station, design of the gravity collection system south of Louviers, easement acquisition for the gravity collection system south of Louviers, design of a force main extension along Moore Road, procurement of easements for the force main along Moore Road, and design of an expansion to the Titan Road lift station. It is agreed between the parties that the first priority of the sizing of the plant components must be to allow us to complete a working 0.4 MGD

system within the ARPA funding that does not prevent the cost-effective expansion of the plant to full buildout.

Non-Binding: This Term Sheet summarizes the major deal points that would form the basis of a more definitive E-85 Wastewater IGA. Each party acknowledges that these terms and any final E-85 Wastewater IGA would be subject to the final review and approval of their board or council.

If this Term Sheet is acceptable, please execute and return a copy to my attention. Once Castle Rock and Dominion have approved and signed Dominion will provide a draft of the E-85 Wastewater IGA and circulate a draft to Castle Rock and CAB for their review. We look forward to working with you to bring wastewater service to the E-85 corridor.

Sincerely,

DocuSigned by:
Andrea Cole
24537AB811BD46E...

Andrea Cole
General Manager, Dominion Water & Sanitation District

AGREED:

Mark Marlowe
Digitally signed by Mark Marlowe
DN: cn=Mark Marlowe, o=Castle Rock Water, ou, email=mmarlowe@crgov.com, c=US
Date: 2023.04.21 09:36:26 -06'00'

Mark Marlowe
Director of Castle Rock Water

Date: _____

Town of Castle Rock

Agenda Memorandum

Agenda Date: 4/26/2023

Item #: 4. **File #:** WC 2023-042

To: Members of the Castle Rock Water Commission

From: Mark Marlowe, P.E., Director of Castle Rock Water
Roy Gallea, P.E., Engineering Manager
Jeanne Stevens, P.E., CIP Project Manager
Resolution Approving the 2023 Water Master Plan *[Entire Castle Rock Water Service Area]*
Town Council Agenda Date: May 2, 2023

Executive Summary

This memorandum has been prepared to request Town Council approval of a Resolution adopting the 2023 Water Master Plan (see ***Attachment A***). The 2023 Water Master Plan (2023 Plan) presents findings and recommendations resulting from a reassessment of water program needs for the Town of Castle Rock through 2065, with a focus on near term needs through 2027.

Currently the Town of Castle Rock's potable water distribution system, which serves a population of over 82,000, has more than 14,800 system valves, more than 4,720 active fire hydrants, is over 439 miles in total length, and distributes (on average) in excess of 9.38 million gallons of potable water each day to the customers of Castle Rock. The 2022 peak day demand was 19.22 million gallons per day (MGD). At an estimated build-out population that accounts for future annexations of potential infill areas and extraterritorial services, the distribution system could serve more than 155,000 residents.

For planning purposes, the 2023 Plan estimates high-case and low-case scenarios to encompass a range of possibilities. In order to plan for varying scenarios, Castle Rock Water (CRW) has identified that projected demands could be as low as 12,546 Acre-Feet (AF) under the high water conservation scenario of 100 gallons per capita day (gpcd), and 112,000 people versus 23,439 AF under a low water conservation scenario of 135 gpcd with 155,000 people. In the 2023 Plan, the base scenario is 118 gpcd at a population of 122,000, and corresponds to a projected demand of 16,126 AF by 2050. This includes an assumption that once the estimated build-out population is reached, no more population growth is planned under that scenario.

The following represent key efforts and planned major investments CRW will be doing going forward as part of the plan:

- Investigate whether the migration to direct potable reuse (DPR) from the current indirect potable reuse (IPR) scenario is the right path forward for CRW, looking at the cost, regulatory,

technical and water quality implications to make an informed decision for its customers;
- Evaluate water quality continuously, health advisories and maximum contaminant levels and continue to optimize water treatment to address these items as science and regulation develop;
- Monitor our drinking water reservoirs and develop programs to ensure raw water quality in these reservoirs is maintained;
- Complete Advanced Metering Infrastructure (AMI);
- Execute the SCADA Master Plan with a focus on continuing to improve our cybersecurity;
- Fully incorporate the service area to include the existing Bell Mountain Ranch system;
- Ramp up the Rehab and Replacement Plan with priorities being the Prestwick water line replacement in 2023 and Young American rehab and replacement in 2024 and 2025. Young American will be phased due to size and budget constraints of $2 Million/year;
- Support state and local efforts to reduce phosphorus and nitrogen in the local watersheds through its participation with the Chatfield Watershed Authority (CWA) and the Cherry Creek Basin Water Quality Authority (CCBWQA);
- Work with partnering agencies to expand our capabilities to store and/or bring reusable water supplies back to the Town;
- Advance regional projects that position CRW for the future. Projects to construct infrastructure such as reservoirs, pipelines, and treatment facilities are occurring and Castle Rock will continue to support and participate in these projects where it makes sense. This infrastructure helps bring water to the area and, through economies of scale by partnering with other entities, reduces the cost impact to our customers for long-term renewable water supply;
- Defend our groundwater rights against harmful changes to management of those rights by the State, constructing new wells, acquiring additional groundwater rights, and adding new groundwater sources to our groundwater treatment plants that have available capacity as well as constructing new plant capacity where it makes sense;
- Utilize the interconnect with the Pinery to bring CCPWA renewable water back to RWRWTC for retreatment and distribution;
- Identify and implement projects to improve long term sustainability through resource recovery and reducing net energy use;
- Construct and integrate the East Plum Creek Open Space ASR Wells with a construction cost of $2,613,215.01;
- Integrate Bell Mountain into the Castle Rock Water service with the construction of a pump station, pipeline, and tank in 2023;
- Expansion of PCWPF from 6MGD to 12MGD with an estimated cost of $58.8 Million;
- Construction of Tank 11B, a new 2.3MG tank with an estimated cost of $6,600,000;
- Replacement of the aging Tank 3 with an estimated cost of $2,200,000;
- Upgrades to the existing Hillside pump station from 800gpm to 2,600gpm;

History of Past Town Council. Boards & Commissions, or Other Discussions

Town Council adopted the 2017 Water Master Plan by Resolution 2017-099 on November 14, 2017.

Discussion

This 2023 Plan builds on the previous master planning efforts and outlines general planning for expansion and optimization of the Castle Rock Water System necessary to meet the evolving needs of the local community.

The following principles serve as the base for the Town's water programs:

Principle 1: Protect People, Property and the Environment
Principle 2: Plan for the Future
Principle 3: Encourage Coordination of Infrastructure Needs
Principle 4: Operate the Water Enterprise Fund as a Business, Balancing Revenue and Expenses
Principle 5: Provide for Effective Long-term Operation and Maintenance of Water System Facilities
Principle 6: Ensure Water Planning is Consistent with, and Considered Part of, a Fully Integrated Total Water Management Approach
Principle 7: Identify and Implement Changes to the Water System which will improve long term sustainability through resource recovery and net zero energy use

Much of the effort to revise the 2023 Plan was to revisit the hydraulic planning model based on future and evolving water supply and demand models, and to update the Capital Improvement Plan to incorporate WISE and other regional components into the Castle Rock Water system. After changes to the landscape and irrigation criteria for new development were adopted in November 2022 (very limited turf for new development), the modeling was revisited. The landscape and irrigation criteria changes resulted in the changed timing of many capital projects consistent with the updated water supply and demand model as well as availability of capital reserves, and also eliminated and / or reduced the scope of projects consistent with the expected reduction in total water supply needs and peak demand infrastructure (i.e., reduced the size of future pipes and other infrastructure consistent with revised lower future demand).

Collateral to that effort was revisiting future near-term and long-term capital plans and the cost estimates used. The capital plan is used to identify needed improvements to the supply, treatment, storage, pumping, transmission and distribution systems to handle growth and meet future system demands, but also identifies capital rehabilitation and replacement projects for existing assets. Rehabilitation and replacement of aging infrastructure will take a higher priority in future years, especially as the Town approaches build out. With respect to capital plans, there were some significant changes to the five-year capital plans, but there were also several major changes to the long term (>5 years out) capital plan which were made for this study year. Additional requirements for desalination related to the Water Infrastructure Supply Efficiency (WISE) project as well as increases in capacity in the Plum Creek Water Purification Facility (PCWPF) expansion were incorporated into the Water Resources capital plan and account for a large increase in near term spending.

Long term planning was impacted by upcoming proposed changes to turf restrictions on new homes and non-residential development, which will reduce the future capacity needs as consumption and peak demands in new development will be significantly less than current areas of Town. In the Water fund, additional funds were allocated for future deep groundwater well redrills, new wells, and associated raw waterlines because groundwater resources will still be a component of CRW's water portfolio even as we continue the transition to more renewable and reusable supplies. The total water capital plan for the years 2024-2066 is estimated at $416,388,796, with over $86 Million dedicated to rehabilitation and replacement, an increase of over $113 Million to the previous plan that covered 2021-2060. This does include $50 Million planned for a new water treatment plant in the Crystal Valley Ranch area.

Budget Impact

Annually, Castle Rock Water conducts a rates and fees study and revises the cost of the service model in order to recommend changes, if any, to the rates and fees schedule. Further, the capital plan is devised to try to spread out capital costs in order to minimize any unexpected jump in rates or fees in any one year.

Increases in system development fees (SDF's) primarily affect new development, and support the expansion of facilities or development of new infrastructure to accommodate the increase in demand that comes from growth. System development fees (SDFs) are a function of year-end 2021 fixed assets, 2022 year-end estimates of capital improvement project costs, 2023 through 2065 capital improvement project plans, and system capacity for water, water resources, and wastewater and developable acres for stormwater. For 2023 the adopted increase in SDFs for the water fund was 10%. Several factors are driving the recommended increases in SDFs identified in the SDF model and financial model. First, Castle Rock continues to see strong growth in both residential and non-residential customers from existing entitlements in Town. While growth has slowed in the current year due to external economic factors, projections still indicate continued strong growth in the coming years.

To keep pace with this population increase, additional projects have been added to the long term plan over the last several years and the infrastructure and capital costs for these projects are now better defined. Additional infrastructure and the costs for that infrastructure have also been identified to meet the increased peak demands from a larger customer base. Next, the pace of growth has exceeded projections. This drives the need to build projects sooner to meet annual water supply needs creating the need to generate more revenue sooner. It also requires building peak demand capacity sooner than expected. For example, recent growth has driven the need for additional water SDFs for new wells to help fill the supply needs until longer term renewable water projects can be completed. If growth was occurring more slowly, these wells might not have been needed.

For the monthly water user charges and volumetric fees, there are planned increases of 3.0 to 4.5 percent from 2023 rates for 2024 through 2028. Increases in water user charges reflect fixed operations and maintenance costs, variable operational costs such as electricity (CRW's second largest operating cost) and the costs of capital rehabilitation and replacement.

Proposed Motion

"I move to recommend to Town Council approval of the Resolution as presented"

Attachments

Attachment A: Resolution
Exhibit 1: 2023 Water Master Plan

RESOLUTION NO. 2023-

A RESOLUTION APPROVING AND ADOPTING THE TOWN OF CASTLE ROCK 2023 WATER MASTER PLAN

WHEREAS, the Town of Castle Rock, Colorado (the "Town"), adopted the Water Facilities Master Plan in 2006, updated and re-named it the Water Master Plan in 2010, and updated it again in 2017 (the "Plan"); and

WHEREAS, the Castle Rock Water Commission recommended approval of the Plan on April 26, 2023; and

WHEREAS, Castle Rock Water's goal is to continue to meet the community's requirements for safe, reliable drinking water; and

WHEREAS, Castle Rock Water has updated the plan to demonstrate how the Town intends to meet its goals in the future with particular attention to general planning, expansion, optimization, and meeting the evolving water needs of the local community.

NOW, THEREFORE BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF CASTLE ROCK AS FOLLOWS:

Section 1. Adoption. The 2023 Water Master Plan, attached as ***Exhibit 1*** is hereby approved and adopted.

PASSED, APPROVED, AND ADOPTED this 2nd day of May, 2023, by the Town Council of the Town of Castle Rock, Colorado, on first and final reading by a vote of _____ for and _____ against.

ATTEST:

_____
Lisa Anderson, Town Clerk

TOWN OF CASTLE ROCK

_____
Jason Gray, Mayor

Approved as to form:

_____
Michael J. Hyman, Town Attorney

Approved as to content:

_____
Mark Marlowe, Director of Castle Rock Water

Water Master Plan
2023

Engineering Division

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Acknowledgements

The development of the Castle Rock Water Master Plan was a collaborative effort led by Castle Rock Water Engineering staff. The following staff members made significant contributions of time and input on this document:

Mark Marlowe, Director of Castle Rock Water
Roy Gallea, Engineering Manager
Shawn Griffith, Assistant Director
John Chrestensen, Operations Manager
Walt Schwarz, CIP Project Manager
Matt Hayes, CIP Project Manager
Josh Hansen, CIP Project Manager
Shantanu Tiwari, CIP Project Manager
Jeanne Stevens, CIP Project Manager
Melinda Pastore, Senior Office Assistant
Patrick Thorstenson, Asset Program Manager
Jared Wagner, GIS Technician
Nichol Bussey, Business Solutions Manager

Acronyms and Abbreviations

AF	acre-feet
AF/yr	acre-feet per year
aka	also known as
ADD	Average Day Demand
AMI	Advanced Metering Infrastructure
ANSI	American National Standards Institute
ASR	Aquifer Storage and Recovery
AWWA	American Water Works Association
BEC	Box Elder Creek
BMR	Bell Mountain Ranch
CCPWA	Cherry Creek Project Water Authority
CDPHE	Colorado Department of Public Health and Environment
CEC	Contaminant of Emerging Concern
CIP	Capital Improvement Plan/Project
cfs	cubic feet per second
CO	Colorado
COS	Cost-of-service
CPMD	Castle Pines Metropolitan District
CPNMD	Castle Pines North Metropolitan District
CRW	Castle Rock Water
CWCB	Colorado Water Conservation Board
CWLI	Colorado Water Loss Initiative
DOC	Dissolved Organic Carbon
DOIT	Division of Innovation and Technology
Dominion	Dominion Water and Sanitation District
DWSD	Dominion Water and Sanitation District
ECCV	East Cherry Creek Valley
EMMP	Energy Management Master Plan
ENRCCI	Engineering News Record Construction Cost Index
EPA	United States Environmental Protection Agency
°F	degrees Fahrenheit
FMP	Financial Management Plan
FWTP	Founders Water Treatment Plant
GIS	Geographic Information System
gpcd	gallons per capita per day
gpd	gallons per day
gpm	gallons per minute
GWDUI	groundwater directly under the influence
HAA5s	Haloacetic Acids
HID	Henrylyn Irrigation District
HOA	Homeowner’s Association
HVAC	Heating, Ventilation, Air Conditioning
IREA	Intermountain Rural Electric Association
KPI	Key Performance Indicator

lf	linear feet
LIRFs	Lawn Irrigation Return Flows
MG, Mgal	million gallons
MGD	million gallons per day
MS4	Municipal Separate Storm Sewer System
MWTP	Meadows Water Treatment Plant
NEPA	National Environmental Protection Act
O&M	Operations and Maintenance
PCWPF	Plum Creek Water Purification Facility
PCWRA	Plum Creek Water Reclamation Authority
PFAS	Per- and Polyfluoroalkyl Substances
PWWD	Pinery Water and Wastewater District (Pinery)
Plan	Water Master Plan
PMP	Preventive Maintenance Program
PRV	Pressure Reducing Valve
PW	Public Works
PWP	Aurora's Prairie Waters Project
PWSD	Parker Water and Sanitation District
QMRA	Quantitative Microbial Risk Assessment
RWRWTC	Ray Waterman Regional Water Treatment Center
RHR	Rueter-Hess Reservoir
RHWPF	Rueter-Hess Water Purification Facility
RO	Reverse Osmosis
SCADA	Supervisory Control and Data Acquisition
SDF	System Development Fee
SEO	State Engineer's Office
sf	square feet
SFE	Single Family Equivalent
SMWSA	South Metro Water Supply Authority
SWPP	Source Water Protection Plan
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TOU	Time of Use
Town	Town of Castle Rock
TTHMs	Total Trihalomethanes
UCMR	Unregulated Contaminant Monitoring Rule
UDFCD	Urban Drainage and Flood Control District
UV	Ultraviolet
VFD	Variable Frequency Drive
w/	with
w/o	without
WEMP	Water Efficiency Master Plan
WFMP	Water Facilities Master Plan
WISE	Water Infrastructure and Supply Efficiency
WQCD	Water Quality Control Division
WRIP	Water Resources Implementation Plan

WRMP	Water Resources Master Plan
WROS	Water Resources Optimization Plan
WRSMP	Water Resources Strategic Master Plan
WTP	Water Treatment Plant
Yr/YR	Year
ZOP	zinc orthophosphate

Executive Summary

The 2023 Water Master Plan (WMP) presents findings and recommendations resulting from a reassessment of water program needs for the Town of Castle Rock through 2065, with a focus on near term needs through 2027. This 2023 plan builds on the previous master planning efforts, but is also a stand-alone document.

This document outlines **general planning** for **expansion** and **optimization** of the **Castle Rock Water System** necessary to meet the **evolving water needs of the local community**.

- **General planning** identifies previously completed programs and projects, as well as proposed future programs and projects needed for short-term and long-term planning horizons. Cost estimates for various programs and projects have been outlined as well as funding strategies to cover these costs.

- **Expansion** of the Castle Rock Water System is necessary due to anticipated population growth from both infill development and future Town annexations and expansion of the overall water service area. Timely construction of new capital projects in close coordination with infrastructure projects by local developers, other Town departments, and regional water providers, is integral to intelligent expansion of the water system.

- **Optimization** of the Castle Rock Water System is needed to ensure assets are maintained at the lowest possible life cycle costs. Various operations and maintenance programs, hydraulic modeling programs, and asset management programs are utilized to accomplish this goal. Capital projects to rehabilitate and replace existing infrastructure, completed in coordination with projects by local developers, other Town departments, and regional water providers, are also crucial to optimization of the water system.

- **Castle Rock Water System** is the local infrastructure directly utilized for supply, treatment, storage, pumping, transmission, and distribution of water. It does not include items such as water rights, shared regional infrastructure, and personnel staffing.

- **Evolving water needs of the local community** are the driving force behind the overall plan. Population growth, per capita water demand changes, development activities, drinking water regulatory changes, climate change and drought, and water supply source changes are some of the factors impacting these evolving needs. These factors are in a continuous state of change, thus necessitating regular updates to the Water Master Plan.

Currently the Town of Castle Rock's potable water distribution system, which serves a population of over 82,000, has more than 14,800 system valves, more than 4,720 active fire hydrants, is over 439 miles in total length, and distributes (on average) in excess of 9.38 million gallons of potable water each day to the customers of Castle Rock. The 2022 peak day demand was 19.22 million gallons per day (MGD). At an estimated build-out population that accounts for future annexations of potential infill areas and extraterritorial services, the

distribution system could serve more than 155,000 residents. For planning purposes, we estimate high-case and low-case scenarios to encompass a range of possibilities. In order to plan for varying scenarios, CRW has identified that projected demands could be as low as 12,546 AF under the high water conservation scenario of 100 gpcd, and 112,000 people versus 23,439 AF under a low water conservation scenario of 135 gpcd with 155,000 people. The base scenario is 118 gpcd at a population of 122,000, and corresponds to a projected demand of 16,126 AF by 2050 (note the assumption that once a built-out population is reached, no more population growth is planned)

The following principles serve as the basis for the Town's water programs:

- **Principle 1:** Protect People, Property and the Environment
- **Principle 2:** Plan for the Future
- **Principle 3:** Encourage Coordination of Infrastructure Needs
- **Principle 4:** Operate the Water Enterprise Fund as a business, balancing revenue and expenses
- **Principle 5:** Provide for effective long-term operation and maintenance of water system facilities
- **Principle 6:** Ensure water planning is consistent with, and considered part of, a fully integrated total water management approach
- **Principle 7:** Identify and implement changes to the Water System which will improve long term sustainability through resource recovery and net zero energy use

Much of the effort to revise the Water Master Plan for 2023 was to revisit the hydraulic planning model based on future and evolving water supply and demand models, and to update the Capital Improvement Plan to incorporate WISE and other regional components into the Castle Rock Water system. After changes to the landscape and irrigation criteria for new development were adopted in November 2022 (very limited turf for new development), the modeling was revisited. The landscape and irrigation criteria changes resulted in the changed timing of many capital projects consistent with the updated water supply and demand model as well as availability of capital reserves, and also eliminated and / or reduced the scope of projects consistent with the expected reduction in total water supply needs and peak demand infrastructure (i.e., reduced the size of future pipes and other infrastructure consistent with revised lower future demand).

Collateral to that effort was revisiting future near-term and long-term capital plans and the cost estimates used. The capital plan is used to identify needed improvements to the supply, treatment, storage, pumping, transmission and distribution systems to handle growth and meet future system demands, but also identifies capital rehabilitation and replacement projects for existing assets. Rehabilitation and replacement of aging infrastructure will take a higher priority in future years, especially as the Town approaches build out. With respect to capital plans, there were some significant changes to the five-year capital plans, but there were also several major changes to the long term (>5 years out) capital plan which were made for this study year. Additional requirements for desalination related to the Water Infrastructure Supply Efficiency (WISE) project as well as increases in capacity in the Plum Creek Water Purification

Facility (PCWPF) expansion were incorporated into the Water Resources capital plan and account for a large increase in near term spending.

Long term planning was impacted by upcoming proposed changes to turf restrictions on new homes and non-residential development which will reduce the future capacity needs as consumption and peak demands in new development will be significantly less than current areas of Town. In the Water fund, additional funds were allocated for future deep groundwater well redrills, new wells, and associated raw waterlines because groundwater resources will still be a component of CRW's water portfolio even as we continue the transition to more renewable and reusable supplies. The total water capital plan for the years 2024-2066 is estimated at $416,388,796, with over $86 Million dedicated to rehabilitation and replacement, an increase of over $113 Million to the previous plan that covered 2021-2060. This does include $50 Million planned for a new water treatment plant in the Crystal Valley Ranch area.

Annually, Castle Rock Water conducts a rates and fees study and revises the cost of the service model in order to recommend changes, if any, to the rates and fees schedule. Further, the capital plan is devised to try to spread out capital costs in order to minimize any unexpected jump in rates or fees in any one year.

Increases in system development fees (SDF's) primarily affect new development, and support the expansion of facilities or development of new infrastructure to accommodate the increase in demand that comes from growth. System development fees (SDFs) are a function of year-end 2021 fixed assets, 2022 year-end estimates of capital improvement project costs, 2023 through 2065 capital improvement project plans, and system capacity for water, water resources, and wastewater and developable acres for stormwater. For 2023 the adopted increase in SDFs for the water fund was 10%. Several factors are driving the recommended increases in SDFs identified in the SDF model and financial model. First, Castle Rock continues to see strong growth in both residential and non-residential customers from existing entitlements in Town. While growth has slowed in the current year due to external economic factors, projections still indicate continued strong growth in the coming years.

To keep pace with this population increase, additional projects have been added to the long term plan over the last several years and the infrastructure and capital costs for these projects are now better defined. Additional infrastructure and the costs for that infrastructure have also been identified to meet the increased peak demands from a larger customer base. Next, the pace of growth has exceeded projections. This drives the need to build projects sooner to meet annual water supply needs creating the need to generate more revenue sooner. It also requires building peak demand capacity sooner than expected. For example, recent growth has driven the need for additional water SDFs for new wells to help fill the supply needs until longer term renewable water projects can be completed. If growth was occurring more slowly, these wells might not have been needed.

For the monthly water user charges and volumetric fees, there are planned increases of 3.0 to 4.5 percent from 2022 rates for 2023 through 2027. Increases in water user charges reflect fixed operations and maintenance costs, variable operational costs such as electricity (CRW's second largest operating cost) and the costs of capital rehabilitation and replacement. Several

items in particular contributed to increases of 37% in O&M costs over the five-year study period for rates and fees, and are reflected in the proposed increases in rates:

- Meter costs under supplies are going up significantly as we transition to advanced metering infrastructure (AMI);
- Operating costs for WISE will continue to increase as the full quota of Castle Rock's WISE water is delivered with that occurring in 2026;
- Personnel costs have risen significantly in response to staffing shortages and competition for labor across the region with Castle Rock Water and the Town as a whole taking action on this issue in 2022;
- CORE (the electrical service provider) has increased rates for electricity by 6% across the board in 2022.

Increases in volumetric rate fees reflect variable costs and affect those who may not use water wisely, do not practice conservation within the household, or simply use more water because of a larger household.

In addition to the capital component, the plan lays out programs for the long-term, cost-effective operation and maintenance of the system. These programs include:

- An extensive valve exercising and flushing program to maintain water quality;
- Investment in asset management software and development of the Asset Management Program, that works integrally with the inspection, operations and maintenance programs, and capital planning efforts;
- In-house staff hydraulic modeling and data collection to analyze and optimize the distribution system and forecast future requirements;
- Regularly scheduled maintenance at all water treatment plants, pump stations, pressure reducing valves, and storage tanks;
- Adequate manpower and staffing, and an investment in training, safety, and career development;
- Appropriate investment in equipment and maintenance of facilities;
- Responsible replacement of aged infrastructure;
- Energy demand management and optimization.

Going forward, CRW plans the following to implement the following components of the water master plan:

- Investigate whether the migration to direct potable reuse (DPR) from the current indirect potable reuse (IPR) scenario is the right path forward for CRW, looking at the cost, regulatory, technical and water quality implications to make an informed decision for its customers;
- Evaluate water quality continuously, health advisories and maximum contaminant levels and continue to optimize water treatment to address these items as science and regulation develop;
- Monitor our drinking water reservoirs and develop programs to ensure raw water quality in these reservoirs is maintained;
- Complete Advanced Metering Infrastructure (AMI);

- Execute the SCADA Master Plan with a focus on continuing to improve our cybersecurity;
- Full incorporate the service area to include the existing Bell Mountain Ranch system;
- Ramp up the Rehab and Replacement Plan;
- Support state and local efforts to reduce phosphorus in the local watersheds through its participation with the Chatfield Watershed Authority (CWA) and the Cherry Creek Basin Water Quality Authority (CCBWQA);
- Work with partnering agencies to expand our capabilities to store and/or bring reusable water supplies back to the Town;
- Advance regional projects that position CRW for the future. Projects to construct infrastructure such as reservoirs, pipelines, and treatment facilities are occurring and Castle Rock will continue to support and participate in these projects where it makes sense. This infrastructure helps bring water to the area and, through economies of scale by partnering with other entities, reduces the cost impact to our customers for long-term renewable water supply;
- Defend our groundwater rights against harmful changes to management of those rights by the State, constructing new wells, acquiring additional groundwater rights, and adding new groundwater sources to our groundwater treatment plants that have available capacity as well as constructing new plant capacity where it makes sense;
- Utilize the interconnect with the Pinery to bring CCPWA renewable water back to RWRWTC for retreatment and distribution;
- Identify and implement projects to improve long term sustainability through resource recovery and reducing net energy use.

1. Introduction

This 2023 Water Master Plan update highlights critical findings and recommendations resulting from a reassessment of water infrastructure needs for the Town from current conditions through build out of the community. In 2006, the Town prepared a Water Facilities Master Plan (WFMP) that examined the existing water system infrastructure and identified water supply, treatment, storage, transmission and distribution system capital improvement projects required to provide service to existing and future development through build out of the Town's service area boundary. Specifically, the WFMP included examining the following components of the water supply system:

- Existing water supply, treatment, storage, transmission and distribution system capacity;
- Potable water demands and finished water production capacity;
- Water treatment requirements for meeting existing and future demands;
- Water distribution system modeling for both existing and future conditions;
- Recommended capital improvements for maintaining a safe and reliable drinking water system.

A significant change in 2006 from previous master plans was to migrate towards centralized water treatment facilities rather than provide multiple water treatment plants to serve localized demands or to rely on groundwater without treatment beyond chlorination. This transition was logical given the Town's decision at that time to route the majority of renewable water sources, such as reclaimed water, alluvial water, and imported surface water, from one location, the Rueter-Hess Reservoir (RHR).

Since preparing the 2006 WFMP, water supply strategies have evolved and the Town has modified the approach to supply, treatment, storage, transmission, and distribution of drinking water. Namely, the Town's reliance on nonrenewable groundwater was projected to continue to require new deep aquifer well facilities to be constructed. In 2010 this approach was modified and only replacement wells were to be drilled to maintain the current deep well production capacity. Instead of investing more capital into new non-tributary groundwater, the Town embarked on delivering the first renewable water facility in 2013. The Plum Creek Water Purification Facility, PCWPF, an advanced surface water purification facility, was initially brought online in May of 2013 with a treatment capacity of four MGD. Additional alluvial wells at the South and Central Well fields were also completed to provide renewable water to the facility. The Town also successfully converted all of its water treatment facilities to secondary disinfection with chloramines in 2013, concurrent with the introduction of the PCWPF as the backbone of the system's treatment facilities.

PCWPF remains the backbone of the water system. Treatment was expanded to 6 MGD with the addition of new membrane racks in 2017. In early 2021, the completion of advanced treatment processes at the facility positioned the facility for future DPR, while enhancing the IPR capability. The theme of centralized water treatment facilities still remains and many of the capital improvements related to water storage, transmission and distribution remain vital parts of the updated master plan. Due to a continued reliance on deep groundwater, particularly during peak summer demands, the Town still relies heavily on its groundwater

treatment plants, therefore continues to invest in existing and future wells, and is evaluating the need for a new water treatment plant in the southern part of Town.

In 2016, renewable water sources accounted for roughly 11% of all raw water supply. In 2022, renewable water sources accounted for 35.1% of all raw water supply. The overarching goal is to continue to develop a water supply portfolio that consists of 75% renewable water sources and 25% non-renewable sources by 2050. After 2050, CRW will continue the development of renewable sources working towards a 100% renewable supply in normal or wet hydrologic years by 2065 to complement the existing non-renewable supply. To this end, CRW updated the Water Resources Strategic Master Plan (WRSMP) in 2021 that lays out how we are going to meet that goal over the next thirty-plus years. Additional alluvial water supplies are being developed, and plans to expand the PCWPF to 12 MGD are progressing sooner rather than later in the capital plan.

Imported surface water from the WISE partnership was realized in 2018, bringing the Town closer to its future goal of 75 percent renewable water supplies. The PCWPF was expanded and advanced treatment processes for indirect potable reuse (IPR) were added to treat six MGD, with future expansion to twelve MGD. Two planned diversion structures on Plum Creek, pipelines and pump stations were constructed which allow the Town to capture up to one hundred percent of its reusable effluent, return flows and other water rights, another huge step in meeting the goal of 75 percent renewable water sources and 25% non-renewable sources by 2050. The first diversion, named CR-1, was in operation by July 2017, while the second diversion was acquired with the purchase of the United Water assets near Sedalia in late 2017. Completion of the Plum Creek Diversion Pump Station and Plum Creek Raw Water Return Pipeline in early 2021 allowed CRW to capture almost 100% of its reusable effluent, return flows and other water rights.

Early delays in bringing renewable water supplies to Town, coupled with a vigorous economy from 2017 to 2020, and an uptick in new development, prompted CRW to revisit the supply and demand model and make the hard choice to continue to invest in new deep groundwater wells to supplement near-term water supplies. New wells were constructed in Castlewood Ranch and Lanterns and future wells are planned for the Crystal Valley Ranch area. The Town acquired water rights, deep wells, and a water treatment facility in Bell Mountain Ranch (BMR) in return for assuming the water service needs of that community. CRW is evaluating whether improvements to the BMR WTP, and/or constructing a new WTP in the south part of Town, are needed to supplement treatment capacity, especially to meet peak summer demand.

In 2010 when the original version of this master plan was created, development of the community had slowed considerably due to the economic downturn and a slow and steady growth was projected for the foreseeable future. Since the 2017 update, the Town has seen a dramatic uptick in commercial and residential development, such that the timing and scope of projects has changed, prompting annual rates and fees evaluation to provide for a steady revenue stream to support short and long term capital improvements. Capital improvement plans, typically in five-year planning periods, have been updated based on new patterns and expectations for growth, changes to landscape and irrigation criteria, and evolving along with

the Water Resources Strategic Master Plan. This water master plan update is intended to provide a high level overview of the water system infrastructure and highlight future planned capital improvements.

This water master plan has been developed with consideration to seven guiding principles that reflect the vision and mission of Castle Rock Water. The seventh principle is new since the last master plan update. That principle reflects CRW's vision of forward thinking to continue to be a national leader, and CRW's mission to balance social, environmental and fiscal responsibilities in a sustainable manner.

- **Our Vision:** Castle Rock Water will be a national leader among water utilities, focused on customer satisfaction and delivering outstanding quality and value.

- **Our Mission:** We provide our community with exceptional service that protects public health and balances social, environmental and fiscal responsibilities in a sustainable manner.

Principle 1- Protect People, Property and the Environment

Community drinking water systems have been around for a long time, primarily developing from recognition by public health officials that many infectious diseases were caused by drinking contaminated water supplies that were not adequately managed and treated. Similarly, as community water treatment systems developed, responsible parties came to better understand the need for protecting their source water, both for domestic and recreational uses. Along the way, the Safe Drinking Water Act was passed by Congress to protect drinking water and its sources from naturally occurring and man-made contaminants. Castle Rock Water is transitioning from a groundwater based system to a system using mainly renewable surface water. In line with the principle of protecting people, property and the environment, Castle Rock Water has and will continue to implement projects and programs to ensure we are good stewards.

- **Capital Improvement Program** - Castle Rock Water manages over $622.6 million dollars in total water/water resources assets including six water treatment plants, 454 miles of potable water mains, 53 miles of raw water mains, 9 pump stations, 16 active water storage tanks (two more nearing completions in 2023), 119 active wells, 79 active pressure reducing valves, and other infrastructure. Reliability of the overall water system (current and future facilities) is a primary focus. Castle Rock Water shall construct and maintain facilities which meet or exceed all water quality standards, in the most cost effective manner possible. Castle Rock Water Engineering and Operations staff coordinate to insure efficient project delivery (from project initiation through closeout) of infrastructure that improves the reliability of the overall water system.

- **Design and Construction Standards** – Castle Rock Water staff collaborate on regular updates of design and construction criteria for use in the expansion and optimization of the Castle Rock Water system. These criteria and standards are utilized for both capital improvement projects and developer projects to insure that safe and fiscally responsible

services are provided for all customers. Standards and criteria are revised to keep pace with regulations (for example, state requirements in 2020 related to tracer wire for locating utilities) or with standard construction techniques.

- **Water Quality Focus** – CRW maintains an internationally recognized consulting firm on retainer to help ensure that we are addressing the most up-to-date science on water quality, health advisories and maximum contaminant levels. Castle Rock Water executed an on-call services agreement with CDM Smith in May 2019 (renewable for up to three years) to provide expertise in water quality consulting with emphasis on reuse water and contaminants of emerging concern, and mixing of different water supplies (imported, surface water, reuse water, groundwater, etc.) and the resulting impacts on corrosion control, process control, regulatory limits and aesthetics. The focus of the work will assist CRW with system optimization and the planned integration of new water sources to increase water supply resiliency and meet future projected water demand needs by integrating indirect and direct potable reuse sources. Task orders are issued defining the scope of work requested, and results are generally provided in the form of a final technical memorandum with conclusions and action-item recommendations, depending on the task at hand. Typical tasks to be accomplished include:

    - Plum Creek Water Purification Facility (PCWPF) Treatment Process and Water Quality Review;
    - Water Infrastructure and Supply Efficiency (WISE) Water Quality Review;
    - Denver Basin Groundwater Quality Review;
    - Summarize Raw Water Quality;
    - Monitoring Plan Review;
    - Operations and Treatment Process Review;
    - Distribution Mixing System Model and Review

  Annually, the environmental health and safety group produce an annual report that is a review of the regulatory landscape as it relates to water quality. The study outlines the regulatory changes from previous years, and identifies pending regulation in the coming year, and then comment on the potential impacts to water quality, particularly as they relate to PCWPF, to operations, or even to capital projects.

- **Conservation Focused Projects** - Efficient water use is a key element of living in the semi-arid high desert climate, receiving less than 15 inches of precipitation each year, and is a critical part of the Town of Castle Rock's (Town) water resource strategy. Additionally, the State of Colorado requires that water providers who sell 2,000 AF/yr of water or more annually have a State approved water efficiency plan. Castle Rock Water completed a 2015 Water Efficiency Master Plan (WEMP) that met or exceeded requirements of the Colorado Water Conservation Board Municipal Water Efficiency Plan Guidance Document. This document was updated for 2023. This Plan focuses on demand-side activities, such as education, rates, rebates, audits, and regulations. This Plan also solidifies the Town's commitment to efficient water use and conservation. The WEMP outlines a goal-oriented, performance based, and cost-effective strategy that

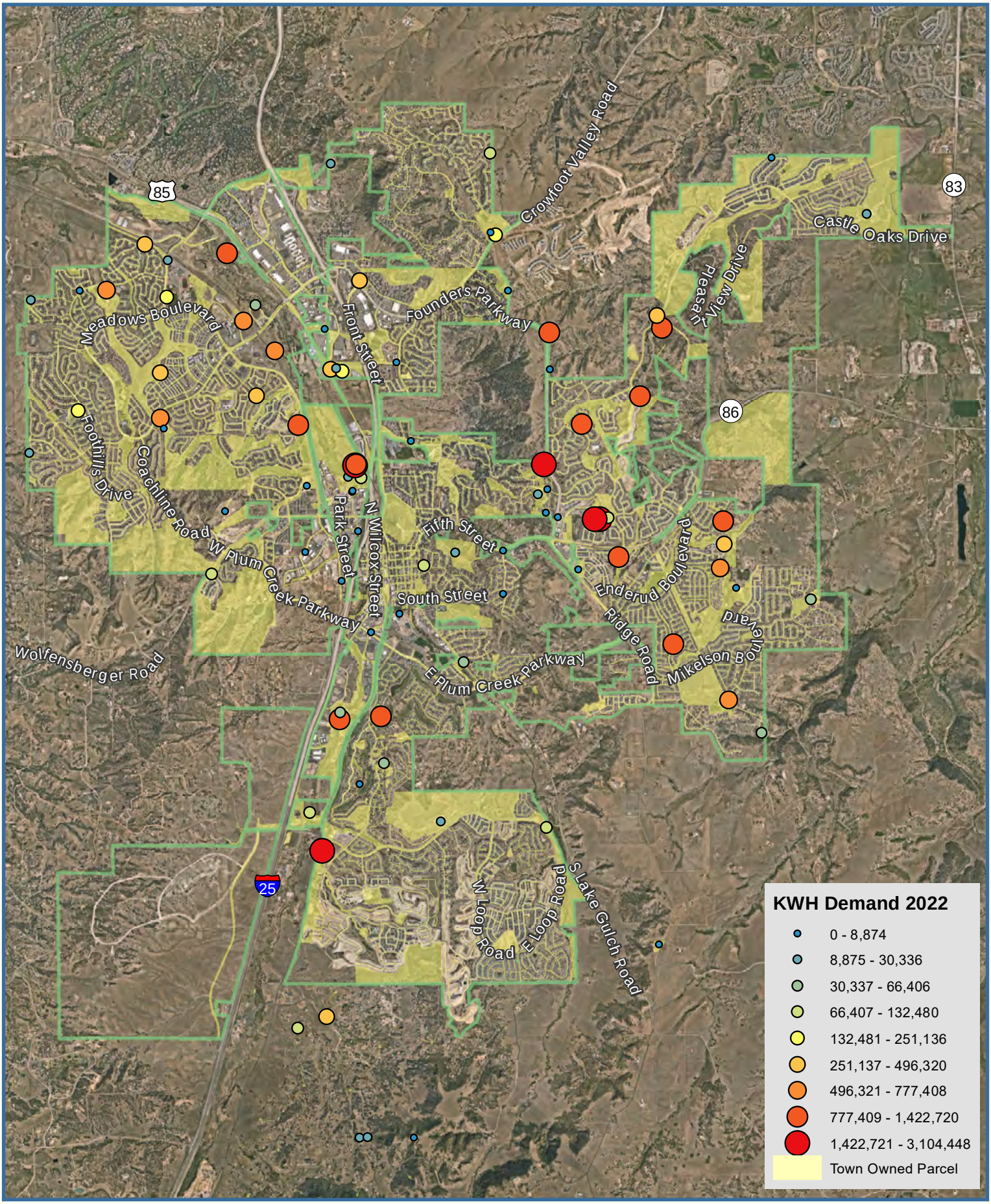
delineates our current conservation programs and identifies the Town's plans for other conservation programs that will result in water savings to our community.

CRW continues to emphasize conservation in order to achieve a per capita demand of 100 gallons per person per day by 2050. This would account for an additional 14.5% savings in water use and essentially would act as a new source of supply. If the Town's existing customers (approximately 82,000 people) are able to reduce water consumption from 118 gallons per person per day to 100 gallons per person per day, the water use savings would represent approximately 1,610 AF/yr. This kind of savings would reduce the need to develop new water supplies potentially avoiding $70 million to over $110 million in future investments. Key initiatives related to conservation that are in progress include reducing the amount of irrigated turf in the community (new landscape and irrigation regulations were adopted in 2022), installing advanced metering infrastructure to allow residents to better manage their water use (underway in 2022 for completion system-wide by 2026), and expansion of greywater systems in new development (a pilot program is underway in Red Hawk for 26 homes).

- **Energy Management** - The second largest operating cost, electricity, reflects full operation of the Plum Creek Water Purification Facility and other treatment plants, alluvial and groundwater well operations and pumping associated with water and wastewater service. As such, the cost of energy used is a significant part of Castle Rock Water's operational budget. CRW is taking multiple approaches to improve operational efficiencies that will in turn reduce energy needs and associated costs. Using less energy will also lessen the environmental impact of daily operations (environmental pollutants are generated in production of energies used). Existing operations are frequently reviewed for opportunities to reduce energy use and new capital infrastructure is designed and constructed with the latest technologies in energy efficiency. CRW is also looking proactively at the use of renewable energy sources to reduce the cost of energy for the provision of water service. A test system of solar power was installed at the new administrative building and is actively being monitored for performance. A heat map (see Figure 1.1) of energy use by CRW in Town has also been developed as well as an identification of property where renewable energies might be appropriate.

- **Comply with all Environmental Regulations –** CRW programs and projects meet or exceed water quality regulations established by the USEPA (Safe Drinking Water Act), the CDPHE and other applicable regulatory agencies. In November of 2017, CRW purchased the United Water and Sanitation District's infrastructure, which included the Plum Creek Diversion structure in Sedalia. In 2020, CRW constructed the Plum Creek Diversion Pump Station at the diversion site, and the 5.87-mile-long Plum Creek Raw Water Return Pipeline from the pump station/CRR1 reservoir to the CRW raw water system to bring renewable water supplies located downstream of the confluence of East and West Plum Creek back to the PCWPF, where the addition of advanced treatment processes was completed in late 2020. The Advanced Treatment (AT) processes at PCWPF provide for a multiple barrier, advanced treatment approach to treat this water in an Indirect Potable Reuse (IPR) scenario. The multiple barrier approach used

existing infrastructure to its fullest extent while adding advanced treatment processes to enhance removal of pathogens, organics, regulated drinking water contaminants, and contaminants of emerging concern. Since the AT expansion came online in early 2021, the PCWPF has been in compliance with all state and federal standards for water quality. CDPHE will be promulgating final rules for DPR in 2023. CRW is evaluating whether the conversion to DPR, versus the current successful operating scenario of IPR, will be in the best interests of the Town.



CASTLE ROCK Qwater
Securing our future drop by drop

0 0.5 1 2 3 Miles

Date: 3/16/2023 1 inch = 6,000 feet

Document Path: J:\GIS\Projects\Energy_Analysis\Town_Prop_Color.mxd

Disclaimer: The data presented has been compiled from various sources, each of which introduces varying degrees of inaccuracies or inconsistencies. Such discrepancies in data are inherent and in supplying this product the Town of Castle Rock assumes no liability for it's use or accuracy. Questions or comments regarding the cartographic composition of this map including, but not limited to, errors, omissions, corrections, and/or updates, should be directed to the Utilities Department, Town of Castle Rock, (720) 733-6087. Copyright 2022, Town of Castle Rock Utilities Mapping.

CASTLE ROCK WATER MASTER PLAN FIGURE 1.1

Principle 2- Plan for the Future

Central to any master plan is that it has to be a plan for the future, and fundamental to good planning is having the right people and tools to develop, analyze and understand the model results. In 2010 Castle Rock Water purchased modeling software and trained staff to develop a water hydraulic model that could be used and updated as growth conditions change. Key components of the Castle Rock Water planning process include:

- **Smart Service Area Expansion** – CRW staff evaluates expansion of service area boundaries where it makes sense to provide maximum economies of scale for our customers or to safeguard our interests in the locally available water supplies, particularly in the aquifers. Service areas may expand as more private unincorporated lands in Douglas County plan to incorporate within the Town boundaries, or where service might be extended by means of an extraterritorial service agreement. In each case our customer base would increase and a priority of Castle Rock Water would be to evaluate the development plan so there is an overall reduction in operating costs to each customer.
    - **Bell Mountain Ranch (BMR**) – in 2022 CRW acquired the water assets of the Bell Mountain subdivision, located just south of the Lanterns subdivision in Crystal Valley Ranch and the payment of system development fees in exchange for a commitment to serve through an extraterritorial agreement. The community of 321 homes had a water treatment plant that needed substantial upgrades to be in compliance, lacked sufficient water storage for its fire flow requirements, and lacked a renewable water strategy for the future. CRW had acquired wells in the BMR subdivision as part of the acquisition of the United Water assets in 2017, but lacked a way to efficiently and beneficially use the wells. The Ridge Estates (lower part of Crystal Valley Ranch) developer needed water storage in the Tan pressure zone of Town, of which none existed, but could be served by a tank in the Bell Mountain area, which the developer is constructing and which will provide for the Ridge Estates storage needs and the additional needed fire flow storage for BMR. This expansion of the service area benefited existing residents and was an example of smart service area expansion.
    - **Macanta (Canyons South)** – CRW agreed to serve the planned development of 968 single family homes back in 2005. At the time, one of the main reasons for extending service was that the project entailed a major ground water acquisition – approximately 2,700 AF of Denver Basin ground water in an area of good yields that would be under CRW control and production. The water rights available exceeded the water rights dedication requirement by 1,400 AF. By serving the community, CRW also ensured that another entity did not develop deep aquifer groundwater wells in that area. The community was also very close to backbone infrastructure of the Town, realizing maximum economies of scale from the Town's infrastructure investment, and generating over $14 million in system development fees. Further, the Town could also ensure conservation oriented landscape and irrigation.

- **Maximize Renewable Water Use** - The Town's water supply strategy is detailed in the Water Resources Strategic Master Plan approved updated in 2021. In short, CRW plans to fully develop and utilize the Town's current renewable water rights which include surface water rights, lawn irrigation return flows, and water reuse in both the Cherry Creek basin and Plum Creek basin. CRW also plans to acquire additional renewable water resources where those resources are cost effective and can be integrated into our existing infrastructure and future planned infrastructure. The water supply strategy will take significant capital expenditures and coordination to integrate new facilities with the Town's existing water distribution system.

- **Maximize Future Water Supplies** - A conjunctive use (or a coordinated blend) of surface water and groundwater will be implemented to balance environmental and fiscal responsibilities. Aquifer storage and recovery (ASR) is one method being implemented to replenish the Denver Basin Aquifer. Treated, renewable water will be injected directly down-hole into existing wells and stored in the aquifer for future use. A pilot program for two ASR wells in the Meadows was completed and conditionally permitted in 2014 to allow testing but issues developed with one of the downhole valves used to control flow. Repairs were made and the project received final approval from the EPA in January of 2023; plans are to begin injection operations in March of 2023. In 2022, construction began on two additional deep groundwater ASR wells at the Ray Waterman Regional Water Treatment Center (RWRWTC) to store excess WISE water. Staff believes that up to a total of 600 AF/yr of renewable water could be stored in the two existing and two new ASR wells.

  Regional water system interconnections and partnership agreements are being developed and projects executed with entities including Water Infrastructure and Supply Efficiency (WISE) Authority, Chatfield Reservoir Mitigation Company, Parker Water and Sanitation District, Dominion Water and Sanitation District, Pinery Water and Wastewater District, Castle Pines Metropolitan District and Cherry Creek Project Water Authority. These interconnections and agreements will allow for import of additional water supplies which will result in reduced cost impact to our customers as well as resiliency in water supply during potential emergencies.

  Water storage expansion programs and projects are being implemented. Operations programs to fully utilize treated water storage are helping increase capacity to meet peak day and fire flow demands without unnecessarily ramping up raw water supplies and treatment plants. Proper water storage management also ensures that water quality is maintained throughout the distribution system. Options for increasing storage of future raw water supplies are also being pursued. Current storage space includes Rueter-Hess Reservoir, Chatfield Reservoir, the future Walker reservoir, expanded Castle Rock Reservoir #1, future Castle Rock Reservoir #2 and ASR facilities. CRW is developing a program to optimize the placement of supplies during periods when they aren't needed by customers.

- **Coordinate Planning –** CRW will continue to coordinate water rehabilitation projects closely with the annual pavement maintenance program managed by the Castle Rock

Public Works Department. Distribution system infrastructure improvements are planned for installation prior to roadways being repaved. Working together with the Public Works Department, Parks and Recreation department, and the development community is important to plan and execute smartly in order to minimize overall expenses and disturbances to customers.

- **Frequent Hydraulic Model Updates –** CRW staff update the hydraulic model annually to account for changes in the water system. The existing hydraulic model of the distribution system is an evolving work in progress to account for such changes as expansion of the service area, new development, revisions to the growth model, changes to landscape regulations and conservation practices, and changes to renewable water supplies being received from the various sources. Continuing updates to the model help ensure that needed improvements to existing facilities are planned and included in the appropriate budget year and are constructed and physically available before the actual demand or need arises. Updates also help ensure that development projects are accounting for potential future needs so that infrastructure can be appropriately sized from the initial planning phase.

- **Water Supply Assessment -** CRW needs to adequately project future water supply demands and secure water for the future. Based on recent and projected development activity, CRW has assumed that the Town could build out to a total future population as high as 155,000 by approximately 2050-2055. CRW is planning for the optimal mix of regulation, conservation, reuse, groundwater and renewable water sources in order to provide the Town with a long-term, sustainable water supply for the Town's future water needs.

- **Water Storage Assessment -** CRW currently has 16 active potable water storage tanks constructed of reinforced concrete and sealed for water quality protection. Two new storage tanks are under construction in 2023 and will add an additional 2.4 million gallons of storage. As the Town's boundaries and developments grow, CRW will evaluate storage needs and plan ahead for future water storage needs, to include replacement of aging tanks.

    - **Peak Demands -** One of the purposes of water storage tanks is to meet peak demands (max day and peak hour) of the water distribution system. The Town has multiple pressure zones that sometimes require more than one tank to serve each zone. The required storage volume for a particular distribution area is calculated by summing up the projected maximum day demand and the maximum fire flow demand for the area. Pump stations and pressure reducing valves (PRVs) are used to move water between pressure zones.

    - **Fire Flow Requirements –** CRW, in coordination with the Town Fire Department, establishes fire flow requirements for an area based on appropriate building codes (code sets the flow rate and duration of flow rates). Fire flow demands are documented in the approved Final Utility Reports for a residential or commercial development. The maximum fire flow demand for any particular

area of Town is used in the modeling and planning processes. Fire flow demands for a particular service area are not cumulative for modeling and planning purposes-only the largest fire flow demand is used. Pump stations and PRVs are used to move water between tanks to supplement storage between zones

- **Drought Tolerant Initiatives –** Droughts of varying durations and severities happen with unplanned regularity over long periods of time. CRW is working to design and construct a water supply and distribution system that will be flexible and resilient in its ability to supply potable water to customers during periods of drought.

    - **Alternate Sources of Supply -** CRW is developing infrastructure to utilize the Town's current renewable water rights, which include surface water rights, lawn irrigation return flows, and water reuse in both the Cherry Creek basin and Plum Creek basin. Development of the Town's Denver Basin groundwater supply will continue. This groundwater supply will help meet the demands of our customers in the short term and provide reliability and drought protection in the long term.

    - **Water Conservation Programs** - CRW developed the 2015 Water Efficiency Master Plan (WEMP) that met or exceeded the Colorado Water Conservation Board Municipal Water Efficiency Plan Guidance Document. The WEMP was updated in early 2023. Effective management of the community's resources is good environmental and financial stewardship. Conservation programs such as installation of advanced metering infrastructure (AMI), a formal meter testing program, and Water Wiser courses are planned to continue and change as needs arise. Effective conservation measures (including AMI) reduce overall water consumption and allow CRW to more accurately determine water use demand patterns for various periods of time. Effective conservation programs allow existing infrastructure to be utilized more efficiently and potentially reduces overall costs of future capital infrastructure expansion. Accurately determining water demand patterns as part of the annual rates and fees analysis and hydraulic modeling allows staff to more effectively plan for raw source water supplies and treatment facilities to meet demands. System leaks and water theft situations are also more readily identified and addressed with a robust metering capability in place.

    - **Landscape Regulations:** In 2022 CRW updated Landscape regulations for all new development, both residential and nonresidential, to be effective January 1, 2023. CRW had determined that the changes were needed in order to meet the strategic goal of 100 gallons per capita per day by 2050. Half of all water consumed by customers was used outdoors. Peak summer demands, primarily due to irrigation, are 4 to 5 times average winter demands. Most turf grass in Castle Rock is considered "non-functional"; non-functional turf is areas of turf where play or recreational activities cannot or do not take place. Turf reductions for new development had the greatest usage reduction benefit. The residential changes adopted included:

- No turf in front yards for new homes;
- Backyards for new homes no more than 500 square feet of irrigated turf (equivalent to a 20' by 25' area);
- ColoradoScape design instead;
- Swimming pools and water features will reduce total allowed turf;
- Incentivized front yard and backyard landscapes to be installed by home builder.

For nonresidential properties, the goal is to eliminate non-functional turf.

CRW acknowledged that the changes would mean lower revenues from system development fees and reduced usage, but noted that the changes would reduce the size of future infrastructure, reduce future O&M costs, and translated into savings of $56 - $72 million in future CIP costs.

Principle 3 - Encourage Coordination of Infrastructure Needs

CRW strives to coordinate with other departments, the development community, and our regional partners to ensure that the financial resources of the department are used judiciously. Timely coordination helps ensure that duplication of efforts does not occur, and also often offers economies of scale.

- **Local Coordination with Public Works -** Public Works has an annual program which identifies Town roadways for maintenance. CRW coordinates with Public Works to ensure that any necessary infrastructure improvements are completed prior to roadway maintenance (and demolition of new pavement is not needed shortly after installation). Several projects were completed in the last five years in close coordination with Public Works:
  - Gordon Drive Improvements – replaced water and sewer pipes, service laterals, and added storm infrastructure, with complete roadway restoration following utilities work.
  - Downtown Alley Improvement Project – replaced some of the oldest sewer pipe in the downtown area before PW reconstructed the alley.
  - Glovers Waterline Replacement Project – replaced all old 6" DIP water pipe with new 8" PVC, replaced all water and sewer laterals within the project area, with roadway reconstruction to follow.

  CRW will continue to coordinate projects with PW to ensure best value for the Town.

- **Local coordination with Parks and Recreation (PR)** – CRW has completed several priority projects with PR in the last five years:
  - Notable was the PCWRA reuse project that brought a reliable source of renewable reuse water to the Red Hawk Golf Course for irrigation, replacing the reliance on a deep, groundwater well. In 2019, CRW completed a 3.5 mile, 8-inch diameter reclaimed water pipeline from the Plum Creek Water Reclamation Authority's treatment facility to the Town's Red Hawk Ridge Golf Course for irrigation use. The golf course had been using a dedicated deep groundwater well to pump untreated raw water to the golf course pond for use in turf irrigation.

Peak summer irrigation demand at the golf course can exceed 600,000 gallons per day and this demand exceeded the golf course's available supply by approximately 200,000 gallons per day. Frequently, in high demand season, CRW staff would supplement the golf course with raw water from the municipal supply system to meet the additional irrigation demand. With the implementation of this project, CRW is able to provide reuse water to Red Hawk Ridge for irrigation and free up Denver Basin groundwater and treated potable water for higher beneficial use. The new source supply is the Town's treated effluent water from the Plum Creek Water Reclamation Authority (PCWRA) that has historically been discharged from PCWRA directly to Plum Creek, or sent to other golf courses.

On average, over 4.5 million gallons per day of the Town's wastewater is reclaimed at the PCWRA, which can be beneficially reused for irrigation and other uses. The Red Hawk reuse system was designed to deliver more than 650,000 gallons per day to the golf course. In 2022, 238.7 acre-feet (AF) of reusable water was sent to the golf course; that is enough water to cover 238.7 acres of land with water one foot deep! The Castle Rock Parks and Recreation Department pays a reuse rate for the water, and also is repaying CRW for the capital costs involved with the pipeline and pump station improvements. The golf course is a valued amenity to the community. The reuse supply water ensures that sufficient water is available to maintain the golf course, especially in times of drought. The project helped the Town maximize reuse water rights, reduce demands on the municipal water system, supply sustainable irrigation water for the golf course and additional nutrients for the turf, reduce irrigation pumping costs, and increase community familiarity with reuse.

Red Hawk Ridge golf course reservoir storage lake

- Another project was the replacement of irrigated turf with artificial turf at several parks. All four of the existing baseball fields at the Metzler Park were converted from natural bluegrass turf to synthetic turf, saving over six million gallons of water annually. The project enabled year-round use of the Town's signature lighted ballfield complex. The synthetic turf will significantly reduce maintenance and will also provide a public demonstration of water conservation. Academy Sports Turf was awarded the construction contract, in the amount of $2,104,500. Construction began in November 2018 and the conversion was completed by March 2019, before irrigation season and in time to accommodate spring baseball. Another conversion was underway in late 2022 to change over the athletic fields in Paintbrush Park to synthetic turf as well. This project will be complete in early 2023.

Installation of the artificial turf at the ballfields

- **Local Coordination with Developers -** CRW works closely with the Town's Development Services Department to help ensure that infrastructure planned for new development will work with existing systems and accommodate future growth. CRW has internal staff that reviews proposed development plans.

  - **Waterline Looping -** Water distribution piping that ends, for example at a dead-end street, is considered a dead-end pipeline. Undesirable water aesthetics (such as taste and odor issues) can result from dead-end pipeline arrangements. Frequent flushing can help to keep the water in these lines fresher. To avoid aesthetic water issues and minimize flushing requirements, and ensure adequate fire flows can be met, CRW will (where reasonably possible) require construction of new water piping from a dead-end line to another pipeline section and essentially loop the distribution system. Looped systems can also more reliably handle a high flow demand situation (such as the need to supply fire flows) in a specific area. Development standards require a minimum 8-inch diameter sized mains to ensure capacity for a 1,500 gpm fire flow, limit the length of dead end

mains, and also limit the number of houses that can be on a dead end main. Developers must model the hydraulics of their proposed water systems to ensure development criteria are met and are required to loop their systems if certain criteria can't be met. Currently, as shown on Figure 1.2, there are about 300 dead end water mains with either air release or blowoff valves at the end, which facilitate flushing operations, and about 90 mains more that are capped, for future potential extension into a new service area.

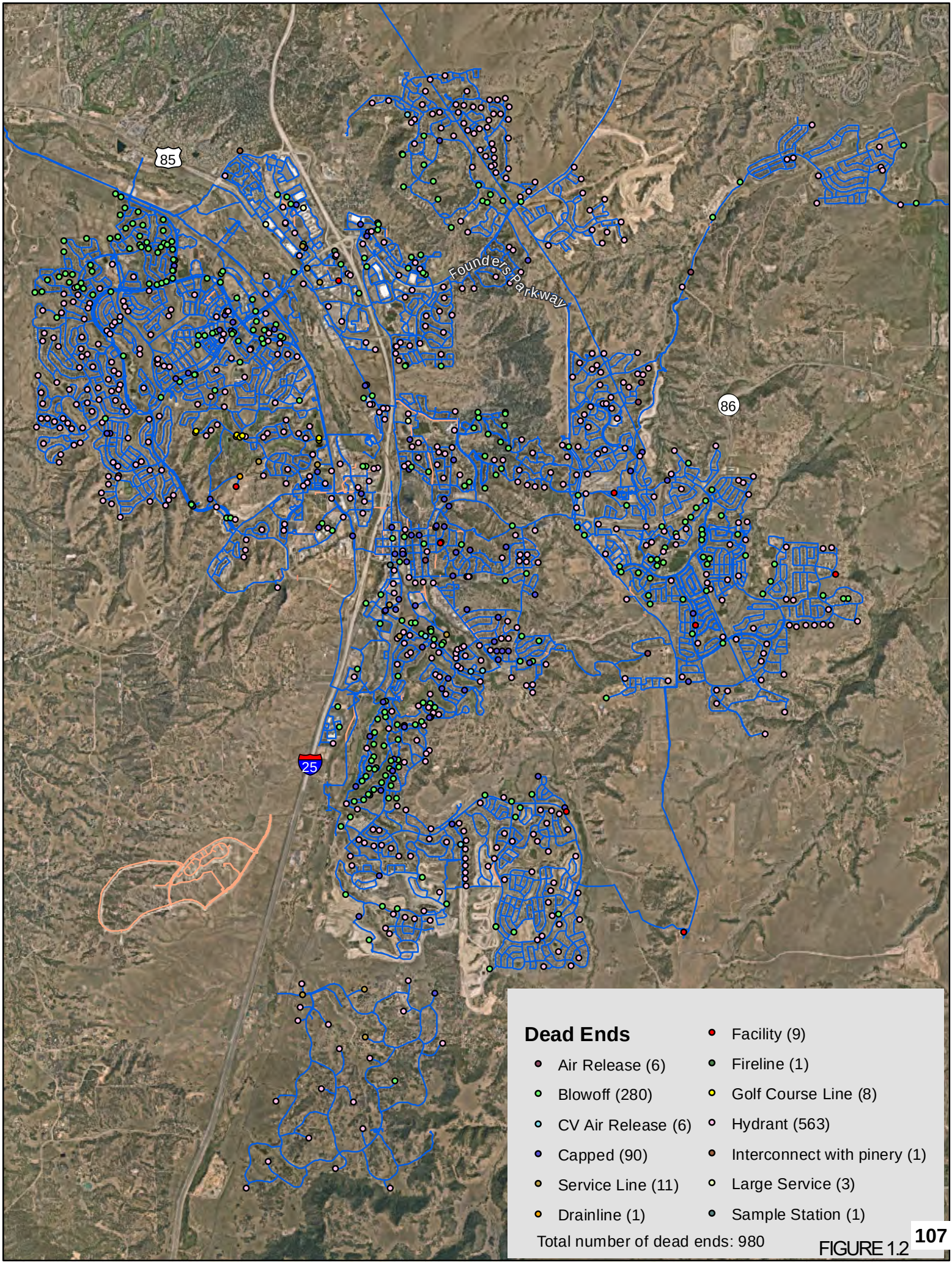

85
Founders Parkway
86
25
Dead Ends
Air Release (6)
Blowoff (280)
CV Air Release (6)
Capped (90)
Service Line (11)
Drainline (1)
Facility (9)
Fireline (1)
Golf Course Line (8)
Hydrant (563)
Interconnect with pinery (1)
Large Service (3)
Sample Station (1)
Total number of dead ends: 980

FIGURE 1.2

- **Waterline Oversizing –** At times CRW may need to increase the size of a new pipeline proposed by a developer if the increased size may benefit the overall distribution system. The hydraulic model is used to forecast and determine supply needs, and resultant pipe sizes, to the various Town pressure zones.

- **Acquisition of Parcels, Right of Way and Easements -** During the development review process, staff help ensure that CRW acquires required corridors and/or dedicated parcels and/or easements for future required infrastructure. Identifying future projects in the Master Plans help plan reviewers and development staff recognize our future needs and ensure that our interests are taken into account. For example, CRW routinely requests parcels for future facilities such as wells, pump stations and water treatment plants. Easements for future raw and potable water lines are also often identified during the planning process.

- **Regional Coordination with Other Communities** - CRW is actively engaged in partnerships and agreements with surrounding communities in regards to regional projects, shared infrastructure and water system interconnections.

  - **Extraterritorial Service Agreements** – CRW has executed extraterritorial service agreements with Bell Mountain Ranch (water service) and Macanta (water and wastewater collections service). In these two cases, CRW as the principal water supplier made sense due to the proximity to the Town's water system, but also ensured CRW managed the access and use to the water rights and reusable water, provided additional entities to share in the cost of future renewable water projects, and, in the case of Macanta, ensured CRW had input into landscape and irrigation criteria used.

  - **Infrastructure Sharing** - CRW is partnering with other entities to share infrastructure and ensure resiliency in the Town's water supply.

    - **WISE** - Partnerships established with entities such as the Water Infrastructure and Supply Efficiency (WISE) Authority, Chatfield Reservoir Mitigation Company, Parker Water and Sanitation District, and Dominion Water and Sanitation District to allow for import of additional supplies.
    - **Parker WSD/RHR** - The Town currently owns storage space in the Rueter-Hess Reservoir (8,000 acre-feet) and is partnering on future infrastructure such as pipelines, pump stations, water treatment plant expansion, and future desalination projects.
    - **Chatfield Reservoir Storage Project** (719 acre-feet with future plans to 2,000 acre-feet). - The Town diverts reuse water at the Plum Creek Diversion near Sedalia and sends this water back to PCWPF for treatment. Reuse supplies that cannot be used directly either are stored in Castle Rock Reservoir No. 1 (CRR1) or captured in Chatfield

Reservoir for storage and future use. CRW is looking at ways to return these supplies back to Town for treatment, or otherwise beneficially exchange them with a partner agency.

- **Pinery Water and Wastewater District (PWWD) and Castle Pines Metro District (CPMD)** - CRW has established emergency interconnects with both the PWWD (constructed in 2013) and CPMD (constructed in 2015). Connecting with neighboring systems and infrastructure helps provide resilience during potential emergencies, and potential future avenues for exchange of water supplies. CRW will continue to work with these and other local water providers on future regional opportunities.
- **Dominion Water and Sanitation District (DWSD**) – DWSD is a partner in the WISE program. CRW has an agreement to wheel DWDS's WISE water though the CRW system to a point of delivery in the Meadows. The delivery point has been ready to serve since late 2020. To date, DWSD has not exercised their WISE option and required CRW to wheel the water. CRW coordinates closely with DWSD to ensure infrastructure is in place to support the agreement.
- **Cherry Creek Project Water Authority (CCPWA)/Walker Reservoir -** Walker Reservoir is a water storage facility located approximately ½-mile northwest of Franktown, Colorado and is currently being constructed by the CCPWA, of which CRW is a member agency. When completed, Walker Reservoir will have a 650 AF capacity and CRW will own 150 AF, or approximately 23% of the capacity. Walker Reservoir will serve multiple functions by being able to store tributary and non-tributary water and to release water for direct use, augmentation and release and re-diversion downstream to RHR.

Principle 4 - Operate the Water Enterprise Fund as a Business

Our Vision is that we will be a national leader among water utilities focused on customer satisfaction and delivering outstanding quality and value. In so doing, our team works diligently to develop capital improvement plans (short and long term planning) that will guide our priorities as we continue to serve our growing community. Operations staff work hard to keep our systems performing optimally, our infrastructure in top condition, and to ensure outstanding water quality at a cost commensurate with neighboring utilities.

- **Key Performance Indicators (KPIs) and Industry Benchmarks** - CRW developed KPIs for use in measuring success and progress against goals and objectives. For example, KPIs of water system integrity measure the number of leaks and line breaks we experience relative to other utilities nationally. For 2022, our KPI for water distribution system integrity (a measure of the number of leaks and line breaks per 100 miles of pipe) was 0.8, placing CRW in the top ten percentile among surveyed participants. Many of the KPIs used are standardized (The American Water Works Association is a source of benchmark KPIs) that will allow us to benchmark our progress against other similar utilities (regionally as well as on a national basis).

- **Minimize Water Quality Complaints** - CRW employs multiple programs to remain in the top quartile nationally each year in regards to minimizing water quality complaints. In 2021, our KPI was 0.2 and placed CRW in the top quartile for water quality.

    - **Water Line Looping -** CRW will plan to construct new water piping from dead-end lines to other pipeline sections and essentially loop the distribution system where needed to ensure outstanding water quality to all customers. For example, early in 2017, Castle Rock Water installed a new waterline along Prairie Hawk Drive, between Atchison Way and Topeka Way. The cost of the project was $163,800, which included design and construction. The blue pressure zone had been extended down to Prairie Hawk along Topeka a few years prior. This created a long dead-end pipe in Topeka. This project created a looped water system for the blue pressure zone. The project consisted of installing approximately 500 linear feet of twelve-inch PVC pipe. The project also included a new water quality sample station.

    - **Storage Tank Mixing** - Water in storage tanks without mixers can stratify in different layers within the tank based on differing temperatures. It is possible for water layers to not turn-over for longer periods of time especially in the winter months when demand is lower but fire flow storage must be adequate. Lack of turn-over can result in water quality issues. Tank mixers have been installed in several Town potable water storage tanks and have been effective in mixing stored water, promoting turn-over, and achieving better water qualities.

    - **Ensure Disinfection Residual** - CRW staff inspect and monitor water distribution system facilities to ensure systems are in prime operating conditions. Strategies implemented on a regular basis to ensure adequate disinfection residual include, but aren't limited to: testing for disinfectant residuals at multiple locations within the distribution system; ensuring water in storage tanks is turned-over; conducting line flushing; and optimizing systems to minimize water age in the system. CRW switched to chloramination in 2013 as it has lower levels of chlorine and the disinfectant protects the water for a longer period of time as the water goes through the distribution system. CRW made the switch to chloramines to have water quality consistent with the Water Infrastructure Supply Efficiency (WISE) water and also due to the introduction of surface water once the PCWPF came online in 2013. Chloramines (a combination of chlorine and ammonia) are the preferred disinfection practice because they produce less disinfection byproducts than chlorine alone.

      Tanks 17A & 17B, completed in 2005 and 2008, respectively, are located on the mesa South of Red Hawk Golf Course. These tanks store approximately four million gallons of water for the red zone pressure

system. Due to low demand in the red pressure zone, these tanks experience water quality issues yearly.

Current operational management strategies to counter water quality issues at these tanks have consisted of keeping the water levels low or taking one tank completely offline. Mixers have also been added to keep the water well-mixed, but has not eliminated issues with low disinfection residual. CRW has to utilize significant labor resources to monitor and sometimes drain the tanks when chlorine residuals fall too low. This wastes labor resources and precious water resources. The timing of the water resources being wasted is a problem as this issue arises primarily in the middle of irrigation season.

In order to maintain the tanks near capacity for CRW's strategic water storage initiative and for firefighting, a chloramination booster station is being added to the tanks to monitor water quality and adjust/boost chemical addition as needed. The Monoclor® Residual Control System, placed in each tank with the adjacent support infrastructure, will monitor the chloramine residual and add chemicals as needed to maintain a residual in the tank, reducing labor costs and the wasting of water and ensuring ongoing water quality compliance.

- **Minimize Waterline Breaks** – Various CRW programs such as leak detecting and pipeline replacement help keep us in the top quartile nationally each year with respect to minimizing the number of waterline breaks per mile of piping. The Waterline Rehab and Replacement program takes into consideration the history of water lines breaks in an area as an indicator that the pipes need to be evaluated for replacement. An example is the Glovers Waterline Replacement project. The project replaced all the waterlines and service lines in the neighborhood, in two phases over three years, primarily due to a history of water line breaks and a lack of mainline valves that greatly inconvenienced the neighborhood each time. A 10-year plan for rehab and replacement of waterlines has been developed that focuses on pre-1980 distribution pipe. Refer to Figure 5.1 in Section 5.

- **Cross Connection Program and Backflow Testing -** Public drinking water systems may become polluted or contaminated through uncontrolled cross-connections. A cross-connection is an actual or potential connection between the public water system and any other system that could accidentally introduce a contaminant into the public water system. This is known as a backflow event. Water normally flows in one direction, from the public water system through the customer's plumbing to a sink tap or other plumbing fixture. Under certain conditions, backflow can occur.

Backflow could be caused by a backsiphonage, or a backpressure condition. Backsiphonage is due to a loss of pressure in the public water system during a high withdrawal of water for fire protection, a water main or plumbing system break, or a shutdown of a water main or plumbing system for repair. Backpressure is due to any condition in the customer's system that would increase their system pressure above the public water supply pressure, causing a reversal of flow.

Annual backflow testing is required on all fire suppression system backflows, all commercial and multifamily domestic/potable backflows, all irrigation if it's a dedicated irrigation line, and single family residential if they have fire suppression systems or recycled water systems in the home.

- **Asset Management -** CRW has implemented a GIS based asset management system to help maintain distribution system infrastructure. Operations staff have an active leak detection program in place that monitors for leaks in the distribution system and especially those areas that have experienced past leaks. Information gathered from such activities, coupled with other feature information such as pipe material and age, can be uploaded in the asset management software to help identify future pipeline replacement projects.

- **Design/Construction Standard Updates** - Construction details and standards are updated on a regular basis to make adjustments as needed to allow for new materials or techniques that improve upon previous design standards. New methods and materials help reduce the likelihood of waterline breaks.

- **Minimize Non-Revenue Water** – Non-revenue water is water loss that adds to system costs and can lead to operational problems in the distribution system. Various CRW programs have been established to reduce non-revenue water to a level that keeps us in the top quartile nationally each year.

    - **Colorado Water Loss Initiative (CWLI) -** Water loss was identified in the Statewide Water Supply Initiative (SWSI) 2010 as a significant factor in the Municipal and Industrial water supply-demand gap[1]. For that purpose, the Colorado Water Conservation Board (CWCB) created the Colorado Water Loss Initiative (CWLI) - a 24-month program designed to teach water utilities and assist them with the implementation of best practices for the management of water losses. Castle Rock Water is a participating utility in the program. The American Water Works Association (AWWA) water audit methodology, described in detail in the AWWA Manual of Water Supply Practices M36 Water Audits and Loss Control Programs, is a recommended best practice and is the industry standard approach for water loss management. This methodology allows for informed decision

[1] Colorado Water Conservation Board, Statewide Water Supply Initiative 2010 (Denver, 2011).

making for water loss control and management activities to reduce losses. CRW has been performing a water loss audit each year since 2012.

The scope of the CWLI comprised a comprehensive program of training and technical review and assistance for water systems across Colorado to attain a basic level of competency with the AWWA water balance and audit concepts and the AWWA Free Water Audit Software (FWAS). The program kicked off in August 2018, and was completed in five stages over the course of two years. This scope included, at a minimum, Level 1 validation of the water audit prepared by CRW.

CRW's report for the audit period of calendar year 2019 was validated in 2020. Key metrics from that audit were a data validity score of 56, an ILI of 0.96, and a real loss of 24.38 gallons per connection per day (gal/conn/day). For comparison, our metrics for the latest completed report, for calendar year 2022, are a data validity score of 50, real losses of 21.6 gal/conn/day, and an ILI of 0.8. For 2022 (the latest year that a number has been calculated for), CRW was just above the lowest quartile for unit real losses, with a data validity score of 50 (recommended value is greater than 71), indicating that we have room for improvement. Actions suggested include: analyzing our business practices and billing functions to identify data gaps; conduct loss assessment investigations on a sample portion of the system; begin long-term assessment of meter replacement, water main replacement and robust billing systems such as AMI (which we are doing).

- **Leak Detection Program** - CRW implements an annual leak detection program. Waterline leak surveys are completed working with a contractor using specialized smart electronic noise correlating equipment. If a leak is found the appropriate repairs are completed. CRW will look to improve this program by evaluating new methods for leak detection.
- **Bulk Water Program** - CRW operates a bulk water station where contractors and county residents can fill approved water trucks after receiving the required permits. Contractors (typically) may use fire hydrants for bulk water usage on a construction site. A permit is also required and an approved hydrant meter and backflow assembly is required before water may be used from the hydrant. The meter assemblies on this equipment are calibrated on a regular basis to accurately account for water used.

- **Reduce Operational Costs** - Develop projects which minimize the operational costs of facilities in accordance with the KPIs, or achieve payback in less than 5 years: Operation of a water and wastewater utility requires the use of a significant amount of energy. For example, deep groundwater wells require electricity to pump water from over 1,000 feet below the ground surface to water treatment facilities. New facilities are being designed and built with an eye towards implementing energy-efficient

technologies. When existing facilities require retrofitting, the life cycle cost of equipment is an important consideration in selecting new systems.

- **Life Cycle Cost Minimization** - New proposed CRW infrastructure is evaluated on the basis of life cycle cost minimization. The life cycle cost of a facility and/or equipment includes all costs of the unit during the life cycle period. These costs include design, construction, operating and maintenance costs.

- **Reduce Energy Costs** - CRW programs incorporate water operations into the energy management plan to minimize energy costs. Next to labor costs, electricity is the second largest operating expense for CRW and optimizing energy use is a responsible practice for an energy-intensive utility. An Energy Team made up from staff has been established and will be evaluating such items as how to maximize operating efficiency of pumping operations. Other energy savings may be achieved elsewhere in operations and consideration of energy cost-saving measures will be included across the utility.
  - **Time of Use Rate Reduction** - Energy providers such as CORE offer a time of use (TOU) program. Customers who can reduce electric usage during peak times are eligible for a reduced rate. CRW subscribes to this program to reduce electrical costs.
  - **Demand Charge Planning** -The CORE demand charge is on top of the electric usage billing. A demand charge is a specified rate multiplied by the peak Kilowatt demand used by CRW per month. Timing of when pumps start (creating a peak usage) is a factor in how facilities are operated during the month. For example, if pumps can be used at night to fill storage tanks, the demand charge may be lower. New and replacement equipment is evaluated for all around energy efficiency including the reduction in demand charges.
  - **Solar** – CRW will look for opportunities to incorporate solar power into our facilities. CRW added photovoltaic solar panels to the new Administration building that was completed in 2021. The system is averaging 1,300 Kwh per month of solar generated power. The system also allows any excess electricity generated by the panels on sunny days to be metered back to the electric utility as a credit.

- **Optimize Chemical Usage and Costs** – Chemical costs are a significant component of CRW's operational costs to treat both water and wastewater. CRW staff use chemical monitoring, SCADA and water quality monitoring to ensure optimal chemical dosing.

- **Advanced Metering Infrastructure (AMI) –** The AMI program has the potential to reduce energy costs for CRW by reducing fuel consumption and carbon emissions. Not only does the AMI program eliminate the need for rolling a truck to obtain a meter read, it also provides customers with up-to-

date water usage with multiple reads daily, encourages water conservation, and can help identify leaks.

An AMI system uses transmitters and signal receiving equipment to remotely read meters, eliminating drive-by technology in which staff in trucks must drive by a meter's physical location to take a read. The frequency at which meter information is received is completely adjustable. AMI will replace the current drive by technology with tower technology which eliminates the need to roll a truck to obtain monthly meter reads. It not only eliminates the need for rolling a truck to get a meter read, it also provides up-to-date water usage with multiple reads daily, encourages water conservation, helps identify leaks, and provides the utility and the customer useful usage alerts in a timely manner, and reduces emissions from vehicles doing drive-bys.

One of the benefits of using AMI is not having to visit individual meter locations to complete a final read (for example, if a home is sold or an apartment tenant is moving, a final read is usually completed for billing purposes). In 2022, final meter reads totaled over 4,600 for the year. This work item requires a staff visit per final read; AMI completes this activity remotely with no site visit required, reducing labor costs.

AMI is a key component of Castle Rock Water's (CRW's) Water Efficiency Master Plan and will not only improve service to our customers but also help encourage water efficiency and conservation, supporting our long term goal of an 14.5% reduction in per capita water use over the next 10 to 20 years. In a recent 2021 residential Town survey, 71% felt that "smart" water metering would be a valuable service. A multi-year AMI program was approved by Council as part of the 2022 budget and the five-year financial plan for 2022 to 2026. The first step in the program was to install four bases stations (aka "towers") around the town that serve as the data collection and routing centers. The four towers were installed in 2022 at Tanks 11, 15, 16 and 17. The program is a multi-year project expected to take 3-4 years to complete. Meters and MXUs that are not AMI compatible have to be replaced. Supply chain issues with getting enough new meters has slowed progress on using a contractor for some of the meter installation work because there is not enough material to keep them busy. The overall cost of the AMI project is roughly $11 Million.

- **Hydropower –** CRW has a demonstration project for downhole electrical generation at its aquifer storage and recovery wells (ASR) at the Ray Waterman Water Treatment Center. Those wells should come on line in 2023.

- **Receive Perfect Sanitary Survey Scores** - CRW programs strive to achieve perfect scores on sanitary surveys through optimal maintenance of the water system. Colorado Department of Public Health and Environment (CDPHE) notes

that a sanitary survey is an on-site review of utility elements including water source, facilities, equipment, operation, and maintenance of a public water system for the purpose of evaluating the adequacy of the facilities for producing and distributing safe drinking water. The sanitary survey is required by the Colorado Primary Drinking Water Regulations and occurs every three to five years. CRW works closely with CDPHE staff throughout the survey period. The expectation is a perfect score from the CDPHE inspector; should any deficiencies be identified they are immediately corrected.

- In September of 2021 a sanitary survey of the water system was conducted by the field services section of the CDPHE Water Quality Control Division. No significant deficiencies or violations were found. Inspectors had six observations with recommendations for correction, mostly concerning updated requirements related to configuration of vents and screening of vents, and storage tanks inspections standard operating procedures. Staff addressed all recommendations to the satisfaction of the CDPHE.

  In between sanitary surveys, CRW started a program in 2018-2019 where we bring in a third party consultant to perform an independent sanitary survey like review of our records and systems. The reason for this program is to ensure that CRW is always ready for a sanitary survey and is also always working to ensure all elements of our facilities are working properly and meeting all regulatory requirements. The next third party evaluation will occur in 2023.

- **Provide Fiscal Responsibility -** Our mission statement includes that we will provide our community with exceptional service that protects public health and balances social, environmental and fiscal responsibilities in a sustainable manner.

    - **Growth pays for Growth** - Every year, Castle Rock Water conducts a rates and fees study that looks closely at the projects we must do to meet the demands of our existing and growing population and maintain a high level of customer service. With that, we adjust the amounts that our customers pay for water availability, water service, usage, and system development (tap) fees. This system has allowed us to be self-sustaining and requires that new growth pays its share for water and related services.
    - **Annual Rates and Fee Studies** - An annual rates and fees study is conducted to analyze future growth and costs and adjust rates for residential, commercial and development, accordingly.
    - **CIP Planning -** The Town has developed a Financial Management Plan which outlines Castle Rock Water's main financial policies, procedures, and outlays for the future. The plan also establishes the goals and the principles to guide Castle Rock Water. The goals are compared to key performance indicators to determine if Castle Rock Water is meeting the goals of the FMP. Each year, the Town does a Cost of Service model

using updated CIP cost estimates and CIP schedules to ensure that the rates and fees increases are smooth and affordable for the customers.

- **Balance Revenue and Expenses** - CRW uses a cost-of-service (COS) model to determine rates and fees for water, wastewater, stormwater, and water resources. The basic philosophy behind a COS methodology is that utilities should be self-sustaining enterprises that are adequately financed with rates and fees that are based on sound engineering and economic principles. Guidelines of water ratemaking are established by the AWWA in Manual M1 – Principles of Water Rates, Fees and Charges. As a result of the most recent COS study for the Town, our consultant developed projected revenue requirements from 2023-2027 that will recover the Town's revenue requirements for operating expenses and capital improvements associated with our plan for meeting future needs.
    - **Annual Budget** - In accordance with the FMP goals, CRW works to keep costs at or under budget for capital and operational budgets each year and continuously strives towards more efficient operations.
    - **Manage Debt Financing and Portfolio** - Capital improvements are funded through a variety of sources, including debt financing. Debt financing may be used only when specific conditions (listed in the Town Charter) are met.
    - **CIP Planning** - CRW planning documents, such as our five-year Strategic Plan, the FMP, the Rehab and Replacement Plan (RRP, draft 2022) and the Capital Improvement Plan allow us to identify key capital projects in the upcoming years. The Town's five-year Capital Improvement Plan is reviewed and prioritized each year as a key task in the budget preparation process.

Principle 5 - Provide for Effective Long Term Operation and Maintenance

Castle Rock Water manages over $622.6 million dollars in total water/water resources assets, and more infrastructure is planned for the future. Such significant investment requires CRW to be good stewards and owners, and that entails comprehensive planning and design, competitive construction, predictive and responsive operations and maintenance, and seamless integration with assets constructed by others.

- **Promote Good Design and Construction** - Design and construction of CRW facilities is completed as a CRW Team effort where various groups have the opportunity to review and comment on proposed facilities. A goal of the design and construction process is for the resulting project to be able to meet the needs of the expanding distribution system, to provide a safe and friendly operating environment, and to have the lowest possible life cycle cost. Requiring projects be developed with adherence to the criteria manuals and the standard details helps ensure product reliability, system functionality and integration with other assets.

    - **Criteria Manuals** - CRW has developed criteria manuals for the Water Distribution, Sanitary Sewer Collection, and Storm Sewer Collection systems.

Criteria manuals may reference standards developed by other agencies such as CDPHE, the EPA, the American Water Works Association (AWWA), the American National Standards Institute (ANSI), and the American Society for Testing and Materials (ASTM).

- **Standard Details** - Standard construction details for the water, sanitary, storm sewer, landscape, and irrigation systems are on the Town's web site. These details are reviewed and revised as new methods and/or technologies are approved.

- **Approved Materials List** - A list of approved materials that can be used in water, sanitary, and storm sewer applications is in the development stage. When completed, this document will be a reference for developers and others to consult when preparing their plans for Town permitting review. Town projects would also be held to these same approved materials. Currently, approved materials can often be found on the applicable standard detail.

- **PW Manual of Construction - The Public Works Department (PW) has a Standard** Special Provisions Document on the Town's web site that is mostly specific to roadway type projects (Colorado Department of Transportation is referenced). CRW standards and details will be coordinated to work with the PW Standard Special Provisions.

- **Maintain our infrastructure** - CRW has more than $622.6 million worth of water infrastructure assets to be managed, operated, optimized, and maintained. This includes 6 water treatment plants, 810 miles of water pipes, 53 miles of raw water mains, 9 dedicated pump stations, 16 water storage tanks (two more coming online in 2023), 65 well facilities, 73 active PRVs, and other infrastructure. It is imperative that once we invest in assets, we maintain them for their expected service life, and further, plan for their retirement.

    - **CIP Planning** - An asset management program enables CRW to plan for future major repairs and their costs, utility costs, and other operating costs. Capital rehabilitation and replacement projects are identified in the Water Rehab and Replacement Plan (draft, 2022) and included in the short and long term CIP budgets.

    - **Hydraulic modeling** - CRW has a working hydraulic model of the overall distribution system. The model is updated on a regular basis as facilities in the system change or new infrastructure is added (such as new developments pipelines). The model is essential for use in planning for new developments and/or upgrading existing facilities. Modeling can also help to optimize how water is moved around Town through the various tanks, pressure zones and pumping stations, enabling facilities to operate more efficiently, reducing operating and maintenance costs.

- **Rehabilitation Programs** - CRW runs multiple capital programs for planned rehabilitation and replacement of existing water system infrastructure. These programs are focused on achieving the lowest life cycle costs for these assets.

    - **Tank Rehab** - Tank rehabilitation projects facilitate structural and/or site modifications to existing tanks to ensure reliability and tank integrity.
    - **Distribution System Upgrades** - Planned distribution system upgrades projects ensure system reliability. System valves, pressure reducing valves and vaults, and other appurtenances often require repair and/or replacement before water main pipes do. Such items must be maintained in good operating condition to ensure reliable water transmission and distribution.
    - **Waterline Rehab and Replacement Program** - A significant portion of CRW's water system infrastructure was constructed within the past 50 years. However, there are areas of Town with older pipes that may be approaching the end of their useful lives (for example, 50 years for pipelines). CRW has a replacement program in place that identifies which pipeline sections need replacing and prioritizes which pipelines are critical and need to be at the top of list for replacement. Where applicable, these activities are coordinated with PW and their roadway repaving projects.

- **Asset Management Programs -** CRW has incorporated information management and GIS to become more proactive in terms of planning, operations, and asset maintenance management. Maintaining accurate and up-to-date infrastructure data is a major priority, along with implementing technologies that provide a significant return on investment in cost, business functions and improved customer level-of-service

    - **Condition Assessment Tools** - CRW is developing and improving tools to identify water infrastructure that has reached the end of its useful life and a plan for replacement. A preventive maintenance program associated with asset management will be used to determine replacement schedules based on the type of asset, material, age, service duty and operating costs. As a formal asset management program develops, capital replacements and timing will become better defined.

    - **Life Cycle Cost Evaluation** - CRW will continue to employ methods to evaluate capital improvements and capital replacement projects based on minimizing life cycle costs: Documenting costs over the life of an asset can help identify when an asset has reached the end of its effective life (also from the perspective of its economic life). Tracking life cycle costs has many advantages such as identifying operating and maintenance support required, the real costs of downtime and lost production, and cost of repairs just to name several.

    - **Intelligent Maintenance Plans** - CRW is utilizing asset management programs and SCADA to maximize the life of assets and assess rehabilitation requirements. As the program develops, the asset management program will help to identify how best to maintain equipment and keep it operating most

efficiently within its life expectancy (equipment life can be maximized with ideal maintenance schedules being observed). For example, pump run times can be monitored via SCADA to anticipate when critical parts should be replaced to prevent a failure.

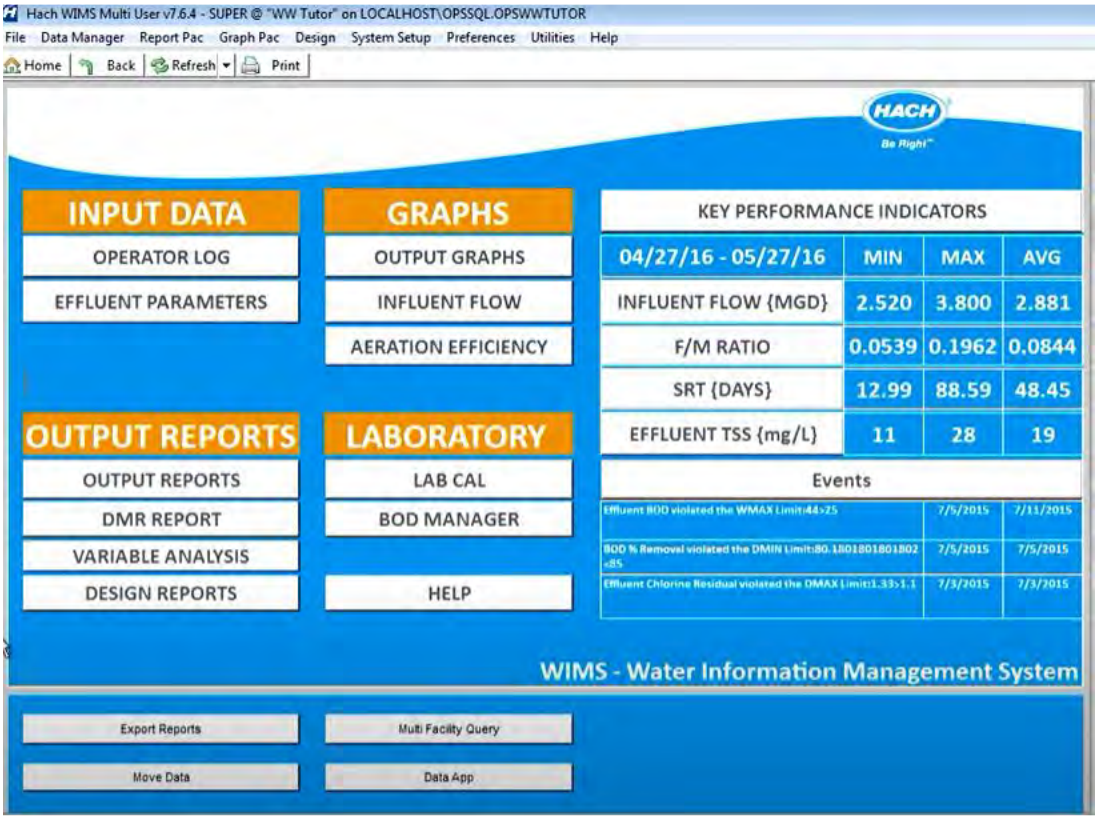
- **Operations and Maintenance Programs –** Day to day operations and maintenance programs are fundamental to ensuring quality water is reliably delivered to CRW customers, but also that our return on investment in facilities and infrastructure is maximized.

    - **Water Treatment Chemical Cost Minimization** - Drinking water produced from the water treatment facilities is constantly being monitored for various water quality parameters. Monitoring water quality after a treatment chemical is added allows operators to make adjustments so the optimum amount of treatment chemical is added to obtain desired results. This operating data is stored in the SCADA system and can be retrieved for evaluation by operators.

    - **Technology Utilization for Operating Optimization** - CRW is working to fully utilize technology to monitor and operate the system in the most efficient manner.

        - **SCADA -** All of the CRW facilities are currently monitored via the SCADA system and data is saved for later evaluation (or real time, as needed). Stored operating data in the SCADA system allows operators to fine tune system settings, establishing the most efficient operational arrangement. Facilities can be monitored and certain parameters changed from remote stations 24 hours a day, seven days a week. The SCADA team maintains the current system and stays on top of the industry, evaluating new equipment and acquiring assets when they improve reliability or system functionality. The SCADA Master Plan was updated in 2019 and identifies future requirements. Planned improvements include cyber security controls, the addition of electronic access control at all new water facilities, the automation of key pressure reducing valve stations, installation of surveillance equipment to improve facility security, strengthening of the communications network, and the replacement of obsolete equipment.
        - **Water Information Management System (WIMS)** – CR Water collects a significant amount of water quality and advanced treatment operational data, and we will increase our data collection in the future. The quantity of regulatory and operational water quality data has been ever-increasing over the past five years. CR Water staff recognized the need to “clean-up” the records, but the time required to effectively collate and manage the data, and to set up action level systems within spreadsheets was restrictive. The necessity of a data management system was becoming obviously apparent to the staff. In 2020, the CR Water On-Call Water Quality Consultant, CDM Smith, began to strongly recommend a Laboratory Information Management System (LIMS) software that could hold and manage a large amount of data, directly connect to and report

the data collected by the SCADA system, and to provide reporting and action level warning capabilities. In 2021, CDM Smith assisted with the qualitative evaluation and selection of a LIMS that would be suitable to the needs of CR Water. The Water Information Management System (WIMS) software developed by HACH was selected because it is tailored to the water and wastewater industries and it meets the criteria that CDM Smith recommended. The software will provide a central and secure database to efficiently manage large amounts of data, and to help streamline advanced treatment operations. The WIMS software is also used by PCWRA, allowing seamless integration of data with PCWPF, which will be of great value if CR Water transitions to DPR in the future. The CRW WIMS is under development and integration into the CRW system for full-scale usage in early 2023.



Screen Shot of Sample WIMS Dashboard

- **Web-based Denver Basin Groundwater Wells Study** - It is important that staff understand the hydrogeologic characteristics and the long-term sustainability of the aquifers and to be able to efficiently use the available well and aquifer data to make more informed decisions about how to develop and access the Town's water resources. In 2022 CRW contracted with a water resources consultant Leonard Rice Engineers (LRE) for a Denver Basin Sustainability Study. Phase 1 of the study is to

create dashboards that utilize a centralized database of water level, aquifer elevations, pumping rate, and volume data. The dashboard will utilize these databases to graphically display the water level data through time compared to the top and bottom of the aquifers, display how the pumping rates and volume have changed over time, calculate and graphically display linear water level trends illustrating those trends, and calculate and display rolling pumping and water level averages. Having this information easily accessible will allow staff to effectively make decisions on how to manage the Town's well fields and use of the groundwater resources. This data will also be used to update assumptions in CRW's water supply and demand model, determine the timing of new well facilities, and evaluate the success of our rehabilitation and replacement program.

- **Preventive Maintenance Programs (PMPs)** - Operations staff employs multiple preventive maintenance programs for various components of the water system. Staff will continue to implement and improve these programs to meet and exceed the program objectives.

    - **Tank Inspections and Cleaning** - Regular tank inspections and cleanings are critical to ensure optimum water quality of water stored in these tanks. Clean tanks prevent dirty water complaints, help minimize chlorine demand in the distribution system, and help prolong the life of tanks. During inspections defects are identified and corrective steps taken immediately. The tank inspection operating procedures were updated after the last CDPHE sanitary survey in September 2021 to ensure compliance with CDPHE expectations and to be proactive in identifying and responding to potential tank defects that could compromise water quality.
    - **Valve and Hydrant Inspection** - CRW staff inspect water valves and hydrants on a regular basis to ensure proper functionality which can be critical in certain situations, such as a main line break or a fire.
    - **Leak Detection** - An annual leak detection program is implemented by CRW staff. A contractor with specialized leak detection equipment is employed to evaluate specific areas, with the goal of leak detecting 1/3 of the distribution system annually. Identified leaks are repaired or sections of piping replaced as needed.
    - **Flushing** - CRW maintains an annual water main flushing program. Mainlines, particularly dead-end lines, are flushed to maintain optimal water quality and to ensure that fire hydrants work properly.
    - **Cartegraph OMS** – Operations staff utilize the Cartegraph OMS asset management program to keep track of the many tasks required at the various water facilities in order to ensure system performance. Routine and special tasks are identified, scheduled and tracked in the OMS program, which allows multi-platform access (tablets, PCs, web) and cloud-based, real-time updates.

- **Energy Management -** CRW has developed an Energy Management Master Plan (EMMP) – Phase I (November, 2013). As noted in the plan, energy consumption represents a significant operating expense for CRW. In fact, it is our largest operating cost behind labor. Pumping water for drinking water supply represents the highest use of electricity for the utility. Some of the potential projects identified by CRW to realize energy and cost savings include the following: facility projects (headquarters, well facilities, etc.) with consideration of IREA Time of Use (TOU) rates; program operation of wells to optimize energy consumption; replacement of HVAC equipment with high efficiency units; conduct water treatment backwashes during off peak hours; and improvements in lighting system efficiency. Development and implementation of the EMMP is an ongoing work activity that can result in energy and cost savings. The EMMP will be updated in the coming year.

Principle 6: Ensure Water Planning is Consistent with, and Considered Part of, a Fully Integrated Total Water Management Approach

Castle Rock Water's goal is to provide a sustainable, reliable and renewable water supply, now and into the future, for all of Castle Rock's citizens and businesses, when and where they want it, and at prices that remain reasonable, viable and competitive with surrounding communities. Securing adequate water supplies for the Town's current population base and our projected future demands is critical for our residents. Water is the life-blood of any community and it is incumbent upon Castle Rock Water to meet the mission of having affordable water available when customers turn on the tap. The 2021 Water Resources Strategic Master Plan (WRSPM) lays out how Castle Rock Water is going to meet that goal over the next 20-30 years. In addition to laying out the projects and programs to achieve our renewable water goals and adequate water supply in general, this WRSMP identifies the investments needed from the community to meet Castle Rock's long-term water goals. CRW is an enterprise of the Town and CRW's customers pay rates and fees to cover utility services, including renewable water. The money to pay for renewable water comes from existing customers and new developments. The current plan estimates long-term investments of $523 million will be needed from existing and future customers through 2060. Key components of the Town's water supply strategy include:

- **Supply Transition** - Continue to develop a water supply portfolio that consists of 75 percent renewable water sources and 25 percent non-renewable sources by 2050. After 2050, continue development of renewable sources working towards a one hundred percent renewable supply to complement the existing non-renewable supply. To this end, in 2021 CRW updated the Water Resources Strategic Master Plan (WRSMP) that lays out how we are going to meet that goal over the next thirty-plus years.

- **Conservation** - Implement the ideas that are delineated in the 2023 Water Efficiency Master Plan, such as reducing the amount of irrigated turf in the community, installing

advance metering infrastructure (AMI), retrofitting the landscaping in public rights of way and parks to more water efficient, and expanding the use of graywater systems in new development. Refer to the WEMP for more information on current and future water conservation initiatives.

By way of example, if the Town does not allow turf for any new front yards; limits backyards to no more than 500 square feet (sf) of irrigated turf; and the assumption is made that 155,000 people will be the ultimate population served then the Town could see a reduction of 64% of future outdoor water use (based on what the outdoor water use would be without further turf limitations than today). This would translate to a usage of approximately 100 gpcd at build-out. Without imposing strict turf limitations, it will be very challenging to achieve our usage rate goal of 100 gpcd.

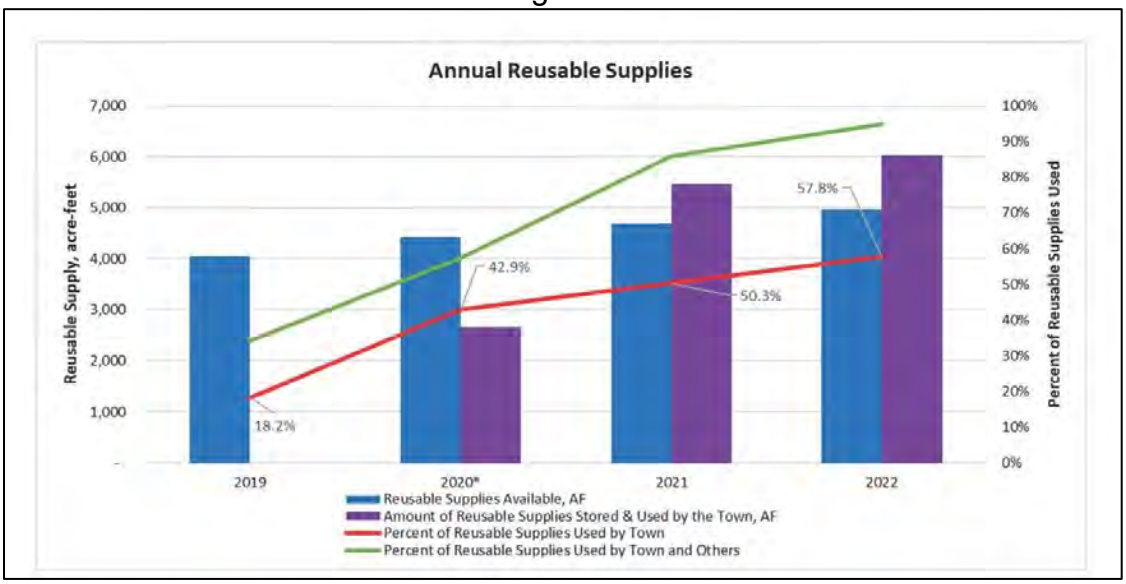
If the Town's existing customers (approximately 82,000 people) are able to reduce water consumption from 118 gallons per person per day to 100 gallons per person per day, the water use savings would represent more than 1,610 AF/yr. This kind of savings would reduce the need to develop new water supplies potentially avoiding $70 million to over $110 million in future investments.

- **Renewable Water Rights** - Fully develop and utilize the Town's current renewable water rights which include senior and junior native surface water rights, lawn irrigation return flows (LIRF), and water reuse in both the Cherry Creek basin and Plum Creek basin. The Town currently has approximately 900 AF of firm yield from the alluvial well system along East Plum Creek which utilizes native rights and reuse water, 8,650 acre-feet of additional junior or highly variable water, and an additional 5,350 acre-feet of reliable supplies which include LIRFs and reuse water. Water that the Town pumps and uses from the Denver Basin aquifer, WISE supplies and future imported supplies can be reused to extinction. The Town diverts reuse water at the Plum Creek Diversion near Sedalia and sends this water back to PCWPF for treatment. Reuse supplies that cannot be used directly either are stored in Castle Rock Reservoir No. 1 (CRR1) or captured in Chatfield Reservoir for storage and future use. Our reuse water represents around one-third of our future projected water supply. Key initiatives in local renewable water include potentially implementing direct potable reuse over the next five years (i.e. taking water directly from the treated end of the water reclamation facility to the front end of the water purification facility), developing a project to pump water stored in Chatfield Reservoir back to Castle Rock, and completing a new pipeline (under design) from our Plum Creek Raw Water Return Pipeline to Rueter-Hess Reservoir.

- **Reuse Supplies** - Fully utilize our reusable water: Water that the Town pumps and uses from the Denver Basin aquifer, WISE supplies and future imported supplies can be reused to extinction. CRW acquired the United Water diversion structure assets in Sedalia on Plum Creek that gave us the ability to re-capture some of these supplies. Usage of these supplies represents approximately 35 percent of our future projected water supply. In 2022, CRW used, allowed to use, or stored almost 100% of its current reusable water supply, as shown in Figure 1.3. Future projects are to expand reservoir

storage in Sedalia, store reusable supplies in existing reservoirs or using ASR, and accelerate reuse supply treatment by expanding the PCWPF facility to 12 MGD.

Figure 1.3



- **Import Renewable Water** - Work in partnership with other entities to import additional supplies and to reduce the cost impact to our customers. The Town has been a member of the South Metro Water Supply Authority since 2004 and has worked in partnership with them to develop the WISE Authority and project. The WISE project has been operating since 2018 but there is more infrastructure to complete for the long term and full scale operation of the project. Significant progress has also been made on the Box Elder project with a water rights case proceeding and most of the needed water rights purchased. Going forward, key actions on imported renewable water include completing remaining WISE infrastructure, designing and constructing Box Elder project infrastructure, developing a collaborative water agreement with agricultural stakeholders for the Box Elder project, and evaluating and determining our level of participation in the Platte Valley Water Partnership with Parker Water.

  In February 2021, CRW became a member of the Cherry Creek Project Water Authority (CCPWA). Other members include the Pinery, Inverness and Cottonwood Sanitation Districts. The CCPWA project can provide an average of 250 acre feet (AF) of renewable water per year for CRW. CRW is working on a project to use the interconnect with the Pinery to bring renewable water supplies (0.25 MGD initially, but up to 1.0 MGD in the future) back to the CRW raw water supply system, retreat it at the Ray Waterman Regional Water Treatment Center (RWRWTC) and send it to distribution. The Pinery treats wastewater from Macanta and Cobblestone which are reusable supplies that the Town has rights to.

- **Reservoir Storage** - Manage our reservoir storage program to optimize the placement of supplies during periods when they are not needed by our customers. CRW is planning for enough storage to satisfy a full year's worth of demand by 2050, or

approximately 20,000 AF. Current storage space includes Rueter-Hess Reservoir (8,000 AF), Chatfield Reservoir (719 AF, expandable to 2,000 AF under an option agreement with the State), Castle Rock Reservoir No. 1 (240 AF), and aquifer storage (430 AF/yr) within the Denver Basin. Additional key storage projects over the coming years include constructing Castle Rock Reservoir No. 2 (790 AF), expanding Castle Rock Reservoir No. 1 (to 560 AF), completing construction of Walker Reservoir (150 AF of storage for Castle Rock), evaluating ASR in the Box Elder Creek and Lost Creek basins, and purchasing additional storage options in Chatfield Reservoir (1,410 AF remaining).

- **Source Water Protection** - CRW developed a Source Water Protection Plan (SWPP) in 2017 as a collaborative effort with multiple stakeholders including local citizens and landowners, private businesses, water operators, local and state governments, and agency representatives and with technical assistance from the Colorado Rural Water Association. In 2022, CRW is updating the SWPP to incorporate the portion of East Plum Creek from the Meadows Parkway Bridge downstream to the confluence with West Plum Creek, as well as West Plum Creek in its entirety.

  Management of watersheds is important because the surface water features and stormwater runoff within a watershed may enter aquifers or other bodies of water and management can impact water quality. Currently, the Town operates fourteen wells that are located in the alluvium of East Plum Creek and two surface water diversions, one on East Plum Creek near the PCWPF (the CR-1 Diversion) and the Plum Creek Diversion located on the main stem on Plum Creek near Sedalia, Colorado. The Town also owns alluvial wells in the Cherry Creek basin (the Converse Wells and other alluvial wells as part of the CCPWA). Watershed management is important to protect water quality for all of these water sources. Further, watershed management and groundwater protection are closely related to measures that have been developed by CRW's Stormwater Division.

  The following are general examples of goals for a watershed management and groundwater protection program:
  - Avoid erosion and sediment loss in susceptible areas to the extent practicable;
  - Preserve areas that provide important water quality benefits (e.g. wetlands) and/or are necessary to maintain riparian and aquatic biota;
  - Protect, to the extent practicable, the natural integrity of water bodies and natural drainage systems (e.g. seeps and springs) associated with site development; and
  - Identify the priority local watershed pollutant reduction opportunities (e.g. improve existing urban and runoff control structures; support legislation to reduce phosphorus in fertilizers and other products to protect the watershed).

  Each of the above management measures is to encourage land use and development planning on a watershed scale that takes into consideration sensitive areas that, by being protected, will maintain and improve water quality.
  Some practices include:

- Protect areas that provide water quality benefits, including wetlands, riparian vegetation and wildlife. This can be accomplished through buffers, easements, deed restrictions and covenants. Developers can be encouraged to protect the water resources as a selling point (aesthetic and ecological amenity).
- Protect the integrity of water resources from the effects of site development and infrastructure. This can be accomplished by establishing setbacks from natural drainage areas including seeps, springs, and groundwater recharge zones. Protecting or promoting vegetated buffers around natural drainage areas to provide additional protection.

As part of protecting the Town's watershed and groundwater, CRW identified eleven potential risks and the best management measures that are used for protection. The risks are identified as construction, development, landscaping, natural disasters, pet waste, roads / deicing practices, soil erosion, solid waste, storage tanks, stormwater runoff, and wastewater treatment plants. Refer to the SWPP for more information.

- **Groundwater Supplies** - Continue to maintain, develop and protect the Town's Denver Basin groundwater supply as a drought supply. The Town currently has approximately 13,500 AF of firm yield from the existing Denver Basin well system. The 2021 WRSMP outlines that the Town will use Denver Basin groundwater to meet 25% of the Town's water demand through 2050, and will continue to utilize it in times of drought. This supply will help meet the demands of our customers in the short term and provide reliability and drought protection in the long term. Availability of deep groundwater, which the Town has been reliant upon for decades, will continue to decrease in the future and ultimately not meet the Town's long-term water needs. Regulatory pressure is also a risk if the State were to impose limits on the total volume of water that can be withdrawn from permitted Denver Basin wells. Areas of focus in the next five years include defending our groundwater rights against harmful changes to management of those rights by the State, full development of the groundwater management model, constructing new wells, acquiring additional groundwater rights, completing the Denver Basin Sustainability study, and adding new groundwater sources to our groundwater treatment plans that have available capacity.

- **Alluvial and Surface Water Supplies** - Continue to maintain, develop and protect the Town's alluvial and surface water supplies. Updating the Town's source water protection plan is a key component of this strategy, as is the Stormwater Municipal Separate Storm Sewer System (MS4) program.

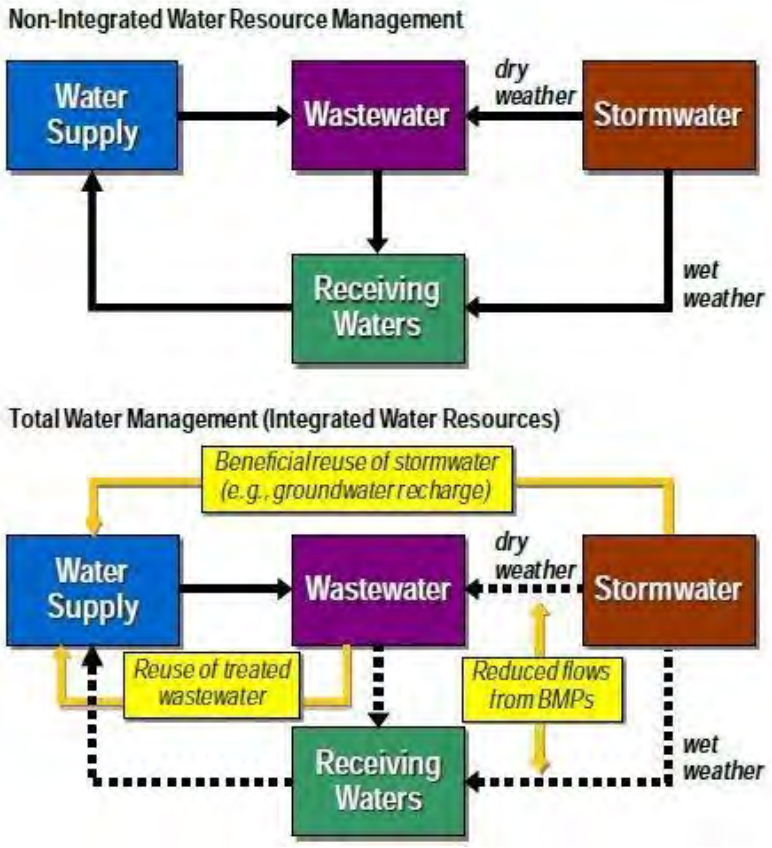


Figure 1.4 Non-integrated water resources management vs. total water management
(Total Water Management, EPA/600/R-12/551; July 2012)

Principle 7: Identify and implement changes to the Water System which will improve long term sustainability through resource recovery and net zero energy use

The most precious resource in wastewater is water. Around 99% by weight of the matter in wastewater is water, a renewable/reusable resource. Large scale centralized Waste Water Treatment Plants (WWTPs) like Plum Creek Water Reclamation Authority (PCWRA) also represent potential collection points for the resources contained in wastewater, namely water, PCWRA is not just a wastewater treatment plant - it is a water reclamation facility (WRF) as the name intends. Water reuse from WRFs, either through IPR or DPR to the water treatment plant, or to irrigation reuse, can significantly reduce a municipality's freshwater demand. It can also be much less energy intensive than relying on deep groundwater extraction wells for non-renewable water with high energy demand pumping. CRW strives to optimize water recovery and reuse and to develop other environmentally responsible options for energy optimization.

- **Water Recovery and Reuse** - Since early 2021 Castle Rock Water (CRW) has practiced, as planned, IPR utilizing water captured from Plum Creek which contains treated wastewater from the PCWRA effluent outfall. The IPR source water is captured

through the Plum Creek Diversion, stored in CRR1 and pumped back to the PCWPF for advanced treatment. When designing the advanced treatment train at PCWPF, CRW had intended to eventually transition from IPR to direct potable reuse (DPR). Now that the Colorado Department of Public Health and Environment (CDPHE) has finalized the Direct Potable Reuse Rule (11.14) and associated Division policies within Regulation 11 Colorado Primary Drinking Water Regulations 5 CCR 1002-11, the Town is investigating whether the shift to DPR is in the best interest of the Town and its customers, or if continuing with existing IPR practices is preferable. As such, CDM Smith, an engineering firm, has been tasked by CRW to assess the costs and benefits of implementing DPR.

Two primary objectives were defined to achieve this goal:

- Performing a qualitative and quantitative alternatives analysis comparing IPR to DPR;
- Conducting a cost-benefit and risk assessment study for DPR.

This work is in process. CRW also plans to proceed with at least the first step of the application to the State for DPR which is to do a full year's worth of analytical testing on the effluent from the water reclamation facility.

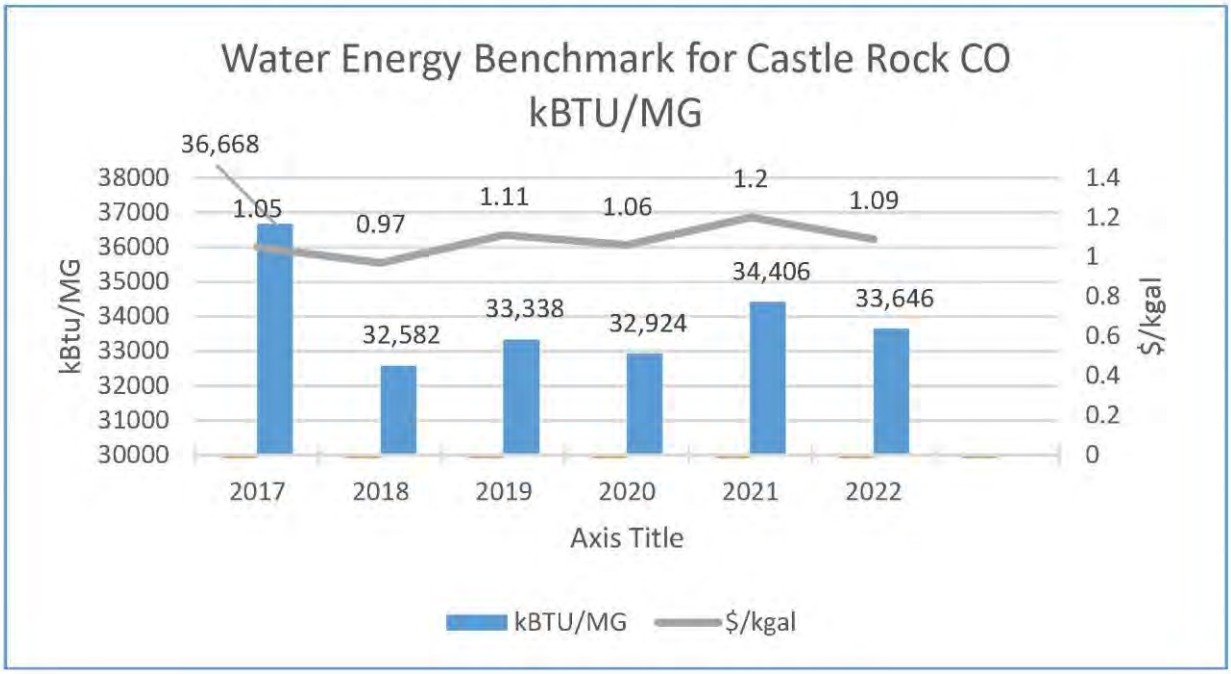
CRW intends to maximize its reuse of water. In the next 5 years, CRW will expand the PCWPF from 6 MGD to 12 MGD.

- **Irrigation Reuse** - Since late 2019 CRW has been providing reusable effluent to the Red Hawk Reuse Golf Course for irrigation. Before the project, the golf course had a deep groundwater well they relied on for irrigation. During dry months, CRW had supplemented the golf course's groundwater well with raw water from other deep groundwater wells and alluvial wells, or at times even treated, potable water. The Town's treated effluent water from the Plum Creek Water Reclamation Authority (PCWRA) had historically been discharged from PCWRA directly to Plum Creek, or sent to other golf courses. On average, over four million gallons per day of the Town's wastewater is reclaimed at the PCWRA, all of which can be beneficially reused for irrigation and other uses. The Red Hawk reuse system was designed to deliver more than 650,000 gallons per day to the golf course. Using reclaimed water for irrigation reduced demands on the aquifer, eliminated a reliance on supplemental, treated, potable water, provided an ideal end-user for reuse, and ensured a reliable source of irrigation water for a valued Town amenity.

- **Energy Management -** The second largest operating cost for CRW, electricity, reflects full operation of the Plum Creek Water Purification Facility and other treatment plants, alluvial and groundwater well operations and pumping associated with water and wastewater service. CORE, Castle Rock Water's electricity provider, increased rates in August 2022 by 6%. Castle Rock Water has implemented an energy management and system optimization plan to maximize the efficiency of electrical usage. This plan will be updated in the near future. Water reuse is actually a key component of energy management. Water reuse from WRFs, either through IPR or DPR to the water

treatment plant, or irrigation reuse, can significantly reduce a municipality's electrical demand because it is much less energy intensive than relying on deep groundwater extraction wells with high energy demand pumping. As shown in Figure 1.5 below, CRW's total energy demand per million gallons has dropped since 2021, despite five percent higher overall water demand in 2022 over 2021. The transition in late 2021 to using the available reuse supplies from Plum Creek versus a higher dependence on deep groundwater wells may explain this.

Figure 1.5 Water Energy Benchmark



- **Solar -** In 2021 CRW constructed a new 12,188 square foot (sf) Administration and Customer Service building equipped with a 1,400 sf photovoltaic solar system capable of generating 25 kW of power. The system is averaging 1,300 Kwh per month of solar generated power. The system also allows any excess electricity generated by the panels on sunny days to be metered back to the electric utility as a credit. CRW is evaluating the performance of the system at the Administration Building and depending on results will be looking for more opportunities to install solar systems. Much of the pumping at well sites and process systems at the water treatment plants are too energy intensive to rely solely on solar, but solar may be used to offset the energy requirements of these facilities and of administrative offices, kitchens and laboratories.

The new Administration & Customer Service Building

CRW may partner with PCWRA on using available land to install a solar array to gather the power of the sun as a way to reduce the overall energy demand at the WRF facility. CRW will also partner with PCWRA on future initiatives to reduce and/or offset energy demand. As part of the next PCWRA utility plan update in 2023, energy efficiency and resource recovery at the WRF will be key topics to be explored.

- **Hydropower** - Potential and kinetic energy recovery from moving water is possible with hydropower technologies. Moving water (raw, treated, or wastewater) has the potential to run a turbine and generate electricity. However, generally a way to use the generated electricity nearby is required. Net metering may be possible to return generated electricity to the supplier's grid. CRW has a demonstration project for downhole electrical generation at its aquifer storage and recovery wells (ASR) at the Ray Waterman Water Treatment Center. Those wells should come on line in 2023.

- **LED Lighting** – CRW has changed out the lighting in several of its facilities to energy efficient LEDs. While the savings are small compared to the overall electrical demand of the facilities, it is a practical way to make our facilities, especially older facilities, more energy efficient. For example, in 2017, operations preventive maintenance staff replaced the older fluorescent lights in the Meadows WTP with new energy efficient LED bulbs. The lights are typically on 24 hours a day, 7 days a week. The new LED lights are longer lasting (reducing manpower costs to replace), energy efficient, and produce a softer light. The project was expected to pay for itself in 4 years in reduced electric bills.

Meadows WTP after lights were replaced with energy efficient LEDs

- **Variable Frequency Drives (VFDs) –** CRW looks for opportunities to add VFDs to pumps and motors during retrofit or replacement projects. A variable frequency drive (VFD) is a type of motor controller that drives an electric motor by varying the frequency and voltage of its power supply. The VFD also has the capacity to control ramp-up and ramp-down of the motor during start or stop, respectively. Benefits to using a VFD include reductions in peak energy demands, reduction in power when not needed, self-diagnostics and communications, and PLC-like functionality and software programming. Adding new VFDs, and replacing older VFDs, is also a goal of the updated 2019 SCADA Master Plan to ensure integral system-wide control and communications. In 2020, plant mechanics and SCADA staff replaced three failing and obsolete VFDs at the Crystal Valley Ranch pump station with new Allen Bradley Power Flex VFDs. The Crystal Valley Ranch pump station pumps water from Tank 15 Red Zone to Tank 6 Green Zone tanks. Originally installed in 2002, the original VFDs had reached the end of their useful service life. A goal of the project was to improve electrical efficiency and move to standardization on a uniform SCADA platform across facilities.

Upgraded Crystal Valley Pump Station Motor Control Center (MCC) and VFDs

2. Master Plan Elements

Water Supply

The Town's source of water supply currently consists of sixty deep groundwater wells drilled within Denver Basin aquifers, fourteen alluvial wells, two surface water diversions, and imported water from the WISE project supplying a total average production capacity of approximately 24 MGD. Annual production of the Denver Basin aquifer has averaged around 2.17 billion gallons per year over the past five years and conservation efforts have continued to reduce the per capita demand from a high of 175 gallons per capita per day (gpcd) in 1990 to a 2022 five-year rolling average of 116.9 gpcd. However, water levels in the aquifers continue to decline and well yields have decreased steadily over the past five years. The average rate of well yield decline for all Denver Basin wells in Castle Rock's water supply portfolio for the period 2018 through 2022 is approximately four percent per year.

Therefore, the Town has been working on developing renewable water supplies from various sources. The long-term goal for water supply is to have a portfolio consisting of 75 percent renewable water comprised of imported surface water, alluvial water and reclaimed water, and 25 percent non-renewable groundwater by 2050, and 100% renewable water usage (in average and wet water years) by 2065. The Town still has the potential to develop more Denver Basin groundwater wells; however, the goal is to limit this resource to the extent possible and focus most of our financial resources toward renewable supplies. The timing of planned development relative to renewable water projects, however, may make additional Denver Basin groundwater wells necessary in the near term. Ultimately, the demand for non-renewable groundwater is targeted for ten MGD with an annual production volume of 3,850 acre-feet per year. This represents approximately half of the annual production capacity required today.

The rolling five-year average per capita demand of 116.9 gpcd is consistent with the long-term goal of 135 gpcd or 400 gpd/SFE. The 2006 WFMP was based on a 400 gpd/SFE demand and this demand remains valid for existing customers in this master plan update, but future demands of 265 gpd/SFE reflect the changes in landscape regulations approved in 2022. The Town's current population is approximately 82,000 people and the high build out population projection is potentially 155,000. To meet this ultimate demand, additional water supplies would have to be developed. These new water supplies fall under the renewable category and are being developed under the Water Resources business enterprise. For planning purposes, we estimate high-case and low-case scenarios to encompass a range of possibilities. In order to plan for varying scenarios, CRW has identified that projected demands could be as low as 12,546 AF under the high water conservation scenario of 100 gpcd, and 112,000 people versus 23,439 AF under a low water conservation scenario of 135 gpcd with 155,000 people. These two scenarios demonstrate the challenges of trying to plan for the future. More information regarding renewable water supply strategies can be found in the Water Resources Strategic Master Plan (WRSMP) 2022 Update.

Raw Water Storage

Reservoir Storage

Castle Rock Water's long-term goal is to provide a sustainable, reliable and renewable water supply for all of Castle Rock's citizens and businesses. Reservoir storage plays a primary role in Castle Rock Water's long term renewable water plan.

- **Rueter-Hess Reservoir Pipeline and Pump Station**
  The Town of Castle Rock secured 8,000 AF of raw water storage in Rueter-Hess Reservoir in 2008. To date, the Town has approximately 20 AF of treated effluent flows from the Cherry Creek Basin stored in the Rueter-Hess Reservoir. Beginning in 2016, unused WISE water deliveries could also be stored in the Rueter-Hess Reservoir. CRW is designing a pipeline and booster pump station to transfer renewable water supplies from the PCRWRP to the Reuter-Hess Reservoir. The 7-mile-long, 16" pipeline will divert up to 4 MGD of renewable water supplies to the reservoir for storage during times when available supplies may exceed what CRW can treat/use/store to meet demands, probably just in winter months. Pipeline construction may start in 2024, and will likely take 12-18 months to complete. The current cost estimate exceeds $16 Million.
- **Castle Rock Reservoir 1 (CRR1) and Castle Rock Reservoir 2 (CRR2)**
  As part of the water supply plan, in 2017 the Town of Castle Rock purchased the United Water assets in Sedalia which included a surface water diversion, pumping and raw water storage facilities located on Plum Creek near the Town of Sedalia. The diversion point is downstream from the confluence of East and West Plum Creek, which will allow the Town to maximize the use of its water rights, including reusable supplies and native supplies owned in East and West Plum Creek. Existing facilities included a diversion structure, two pump stations and a raw water storage reservoir, Castle Rock Water Reservoir No. 1 (CRR1-240 acre-feet capacity). The diversion structure provides for controlled diversion of water from Plum Creek to the Plum Creek Pump Station, which delivers water to CRR1 and to the Ravenna Pump Station (RPS). Construction of the new Plum Creek Diversion Pump Station (PCDPS) was completed in 2021, replacing the existing Plum Creek Pump Station, and was designed to pump raw water from Plum Creek to CRR1 and from CRR1 to the Plum Creek Water Purification Facility (PCWPF) through the nearly 8-mile-long Plum Creek Raw Water Return Pipeline. In accordance with the Water Resources Strategic Master Plan, Castle Rock Water is planning to construct Castle Rock Reservoir No. 2 (CRR2-1,130 acre-feet capacity) immediately east of CRR1. This new reservoir will help Castle Rock Water to accommodate daily high demands during summer months in the coming years and is an additional storage vessel for those times when Castle Rock's junior surface water rights are in priority, or when free river conditions exist. Construction on the CRR2 and the expansion of CRR1 is expected to begin in 2023, taking several years to complete.
- **Chatfield Reservoir Reallocation Project**
  The Chatfield Reservoir Reallocation Project (Project) is a water storage project to reallocate flood storage space in the existing Chatfield Reservoir located in northwest Douglas County to space that can be used for storing renewable water supplies. The Town of Castle Rock is currently, and has been since 2004, a participant in this Project. On June 7, 2014, Town Council approved a resolution to reduce the Town's participation in the Chatfield Storage Reallocation Project from 1,500 AF to 200 AF based on staff's recommendations of the then current need for storage in Chatfield by

the Town and for the need to allocate funding to other renewable water projects. CRW secured 200 AF of raw water storage space in Chatfield Reservoir in 2014. The Town entered into a multi-year agreement with the CWCB in July 2015 to purchase shares in the Chatfield Reservoir Reallocation Project. This agreement has allowed the Town to spread out the project costs over time while the Project was undergoing design and construction activities. The following year CRW entered into an option agreement with the Colorado Water Conservation Board (CWCF) for acquisition of additional storage shares over a multi-year period. Since then, CRW has acquired additional firm storage space that currently totals 719 AF. As the Town continues to develop and firm its renewable water rights on Plum Creek and the South Platte River, in addition to its fully reusable return flows, additional storage in Chatfield becomes beneficial.

- **Walker Reservoir Project**
  Walker Reservoir is a proposed CCPWA water storage project and is located northwest of Franktown. The project will provide 650 AF of storage which will be filled from a combination of future alluvial and deep wells near the reservoir and is to be stored for use during high demand periods. CRW's portion of the storage capacity is 150 AF. The water that is stored in the reservoir will be discharged into Cherry Creek by the project pump station to be picked up downstream by project members.

Aquifer Storage and Recovery (ASR)
Aquifer storage and recovery (ASR) is one method being implemented to replenish the Denver Basin Aquifer. Treated, renewable water will be injected directly down-hole into existing wells and stored in the aquifer for future use. A pilot program for two ASR wells in the Meadows was completed and conditionally permitted in 2014 to allow testing but issues developed with one of the downhole valves used to control flow. Repairs were made and the project received final approval from the EPA in January of 2023; plans are to begin injection operations in March of 2023. In 2022, construction began on two additional deep groundwater ASR wells at the Ray Waterman Regional Water Treatment Center (RWRWTC) to store excess WISE water. Supply chain issues have delayed completion of those wells, and final EPA approval is expected in 2023. Various programs and projects are underway to maximize the use of future water supplies. Typical ASR wells have a maximum injection rate of 80% of the average pumping rate. Based on the information available, staff believes that up to a total of 600 AF/yr of renewable water could be stored in the two existing and two new ASR wells.

Raw Water Pipes

CRW has over 51 miles of raw water piping that conveys raw water from the various alluvial and deep groundwater wells, the diversions, and the raw water storage facilities to the various water treatment plants. With the acquisition of the United Water Assets in 2017, CRW acquired the 16" Ravenna pipeline from our CRR1 reservoir in Sedalia up to Roxborough. In 2021, CRW completed the almost 6 mile-long 30" Plum Creek Raw Water Return Pipeline from the CRR1 reservoir/diversion/pump station back to a connection to the raw water pipeline to PCWPF. At some point, the wells and/or the pipes will reach the end of their useful life, have been replaced or repurposed, or CRW will have transitioned to alternate supplies. Meanwhile, the raw water pipelines are maintained and rehabilitated when necessary. Table 2.1 shows the active, raw water pipes by size and length. See Figure 2.1 for the location of CRW's raw water pipes

Table 2.1 Raw Water Pipes

Dia	Length, LF	Miles	Percent of total
<=6	35,134	6.65	12.9%
8	14,916	2.83	5.5%
10	9,245	1.75	3.4%
12	52,061	9.86	19.1%
14	2,309	0.44	0.8%
16	83,530	15.82	30.6%
18	14,600	2.77	5.3%
20	23,637	4.48	8.7%
24	4,272	0.81	1.6%
30	31,015	5.87	11.4%
36	2,354	0.45	0.9%
54	120	0.02	0.04%
Total	273193	51.74	100.0%

CASTLE ROCK water
Securing our future drop by drop

0 4,625 9,250 18,500 27,750 Feet

1 inch = 9,175 feet

Disclaimer: The data presented has been compiled from various sources, each of which introduces varying degrees of inaccuracies or inconsistencies. Such discrepancies in data are inherent and in supplying this product the Town of Castle Rock assumes no liability for it's use or accuracy. Questions or comments regarding the cartographic composition of this map including, but not limited to, errors, omissions, corrections, and/or updates, should be directed to the Utilities Department, Town of Castle Rock, (720) 733-6056. Copyright 2022, Town of Castle Rock Utilities Mapping.

CASTLE ROCK WATER
FIGURE 2.1
RAW WATER PIPES

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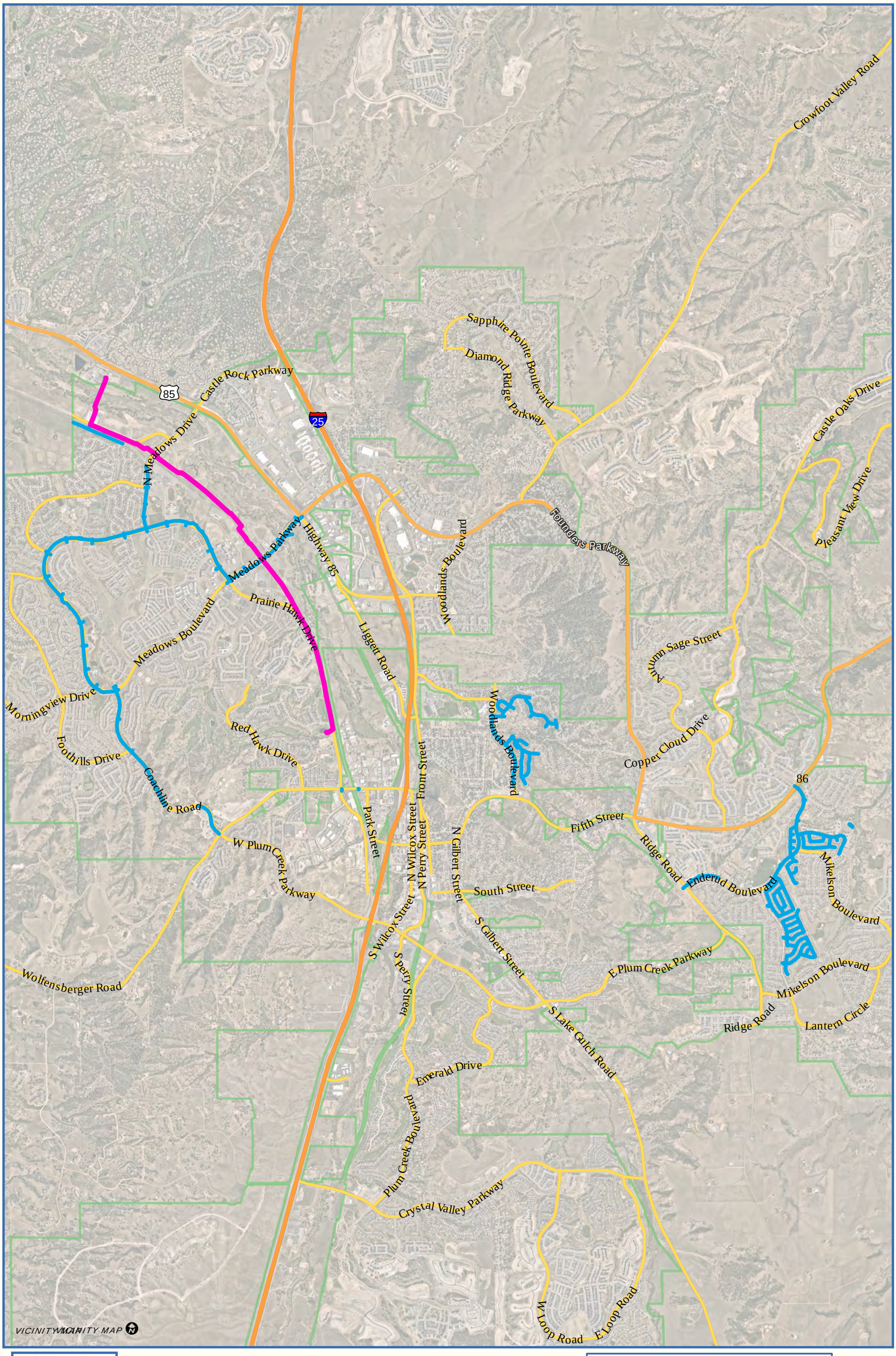
Reuse and Reclaimed Water Pipes

CRW has almost 19 miles of reuse and reclaimed water pipes, as shown in Table 2.2. Much of the pipe was installed in the 1980s when the Town began to grow and was considering a dual pipe system where reclaimed water and dedicated pipes would serve irrigation demands and potable demands would be on a separate pipe system. Much of the original Founders, Woodlands, and some of the Meadows early neighborhoods had dual pipe systems. However, as centralized wastewater treatment was too far away to be practical, and dedicated storage required also, CRW has historically charged much of the reuse/reclaimed water pipes with potable water each spring. The Red Hawk Reuse pipe, almost 3.5 miles of 8" pipe, was installed in 2019 to serve the Red Hawk golf course, and is a truly reuse system; reclaimed water from the PCWRA is pumped directly to the golf course reservoir for direct reuse. In the future, much of the reuse pipes in the neighborhoods will probably have to be rehabilitated and/or replaced due to age and condition, or the existing potable systems may have to be upsized to meet daily demands and irrigation demands. Replacing existing potable lines of the dual systems and upsizing them instead of replacing and maintaining the dual pipes may be the more economical approach and will be evaluated in the future as part of the rehab and replacement program. Refer to Figure 2.2 for the locations or reuse and reclaimed pipes.

Table 2.2 Reuse/Reclaimed Pipes

Diameter (in)	Length (miles)	Linear Feet	% of total
4, 6	5.08	26800	26.8%
8	9.82	51857	51.9%
12	2.85	15072	15.1%
16	1.05	5548	5.6%
18	0.12	621	0.6%
Total	18.92	99898	1.00



CASTLE ROCK water
Securing our future drop by drop

0 1,650 3,300 6,600 9,900 Feet

1 inch = 3,332 feet

CASTLE ROCK WATER
FIGURE 2.2
REUSE/RECLAIMED WATER PIPES

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Water Treatment

Five groundwater filtration plants and one surface water advanced treatment plant (PCWPF) currently serve the Town and have a combined treatment capacity of 27.92 MGD. The Town acquired the Bell Mountain WTP and other assets in 2022 when it agreed to absorb their infrastructure and provide water service to the community under the terms of an extraterritorial service agreement. Table 2-3 lists the six plants and their capacities. Treatment capacity currently exceeds the available water supply for all of the groundwater plants except the BMR plant. At the time of the 2017 WMP, there were no firm plans to add groundwater treatment capacity since the groundwater supply is limited to 14.5 MGD and the long-term future demand for groundwater is projected to be less than four MGD (WRSMP, 2021). However, the timing of demand and the supply for renewable water, the aging of existing plants, and where growth will occur, prompted CRW to investigate the potential for a new WTP in the southern part of town or a potential rehab/upsize of the BMR WTP. Currently, the plan is to construct up to an 8 MGD WTP in a site in Crystal Valley Ranch; $50 Million has been included in the future CIP plan for the construction. Wells facilities and raw water lines will also be constructed. The project capacity might be phased to spread out capital construction costs.

The Town currently owns all of the Denver Basin groundwater rights underneath the Town, as well as some renewable water rights. The Town has more than 40,000 acre-feet of groundwater rights, but the Town does not have the necessary infrastructure in place to access all of these water rights. Groundwater is considered a non-renewable resource, and therefore, it is imperative that we continue transitioning to the Town's ultimate water portfolio goal of 75% renewable and 25% non-renewable by 2050.

The Plum Creek Water Purification Facility (surface water treatment) was completed in 2013, and was expanded to six MGD firm treatment capacity in 2017 with the addition of two MGD of additional membrane filtration equipment racks. The PCWPF was expanded in 2021 to include Advanced Treatment (AT) processes, up to 12 MGD for some of the unit processes to accommodate future expansion. While treatment processes at PCWPF already met local, State and Federal regulations for safe drinking water, AT processes were added to treat reusable surface water sources in a potential future DPR scenario. The additional AT processes provide redundancies, focus on contaminants of emerging concern (CECs), and add to the new standards being established by systems utilizing reuse water. The project and CRW staff received various accolades:

Concurrent with the expansion of PCWPF to include AT processes, CRW was completing several other high priority projects to expand the capability to capture and treat reusable supplies. These projects (see Section 4 for discussion) included:

- Upgrades to the Plum Creek Diversion facility
- Plum Creek Raw Water Return Pipeline
- Plum Creek Diversion Pump Station

Indirect Potable Reuse and Direct Potable Reuse

The Advanced Treatment (AT) processes at PCWPF provide for a multiple barrier, advanced treatment approach to treat this water in an Indirect Potable Reuse (IPR) scenario. The multiple barrier approach added advanced treatment processes to enhance removal of pathogens, organics, regulated drinking water contaminants, and contaminants of emerging concern. Since the AT expansion came online in early 2021, the PCWPF has been in compliance with all state and federal standards for water quality. CDPHE should be promulgating final rules for DPR in 2023. CRW is evaluating whether the conversion to DPR, versus the current successful operating scenario of IPR, will be in the best interests of the Town.

Raw water quality to PCWPF is generally improved via blending with surface water in the natural stream environment, and the distance involved promotes additional time for natural microbial and chemical attenuation processes in the Plum Creek and CRR1. However, there are water quality considerations for either the IPR or the DPR strategy. The environmental buffers (Plum Creek and CRR1) are susceptible to deterioration of water quality due to natural processes such as harmful algal blooms, TDS spikes, and wildfire impacts. PCWPF does not have treatment technology for TDS removal, therefore strategies for TDS management will need to be established regardless of IPR or DPR source alternatives.

Diurnal fluctuations in ammonia and nitrates in PCWRA treated wastewater will warrant increased operator attention at PCWPF in a DPR scenario. Contaminants of Emerging Concern (CECs), such as perfluoroalkyl substances (PFAS), could be higher in concentration in a DPR scenario due to absence of the environmental buffer that the Plum Creek natural

flows afford. PCWPF is designed to handle the removal of these contaminants to minimize risk, but there may be increased O&M requirements and/or treatment modifications and optimization necessary.

The DPR scenario requires purchase of multiple online analyzers for treated wastewater and advanced treated water monitoring. With DPR, there is a potential necessity for additional treatment requirements for pathogen reduction dependent upon the results of a site-specific Quantitative Microbial Risk Assessment (QMRA) that CDPHE will require. CRW is planning to do this QMRA in the current planning period. Disinfection byproduct (DBPs) precursor concentrations such as bromide could increase in the PCWPF influent due to higher percentages of PCWRA treated wastewater, necessitating adjustments to existing DBP management strategies (e.g., bromate control as related to ozone dose). In the event of an upset condition at the PCWRA, or a spill or discharge that adversely impacts the Plum Creek, the current IPR scenario affords more time to respond than the DPR scenario. Future use of DPR will require strategies for managing any upsets.

Advanced Treatment GAC filters at the PCWPF

Advanced Treatment Ozone Contact Time Piping at the PCWPF

Current plans for full expansion of PCWPF will follow a three phase schedule of construction to reach ultimate treatment, pumping and distribution capacity of 12 MGD by 2031. Phase 1 will increase the treatment and distribution capacity to 8 MGD by early 2026. Included in Phase 1 is the replacement of 12,500 linear feet of existing 16-inch potable pipeline with new 30-inch pipe, to include a 1,500 linear feet horizontal directional bore under Plum Creek to minimize impacts to endangered Prebles Mouse Habitat. Phase 2 will increase treatment and pumping capacity to 10 MGD, for completion in 2028. The final phase to reach 12 MGD of treatment and pumping is planned to be completed by early 2031. Current estimated opinion of costs (in 2021 dollars) for the three-phased expansion to 12 MGD is about $56.5 Million. Phase 1 design should occur in 2023, with a two-year construction phase in 2024-2025, with processes online to meet demand in 2026.

Engineering will continue to work with Operations to make minor modifications to the treatment processes and building infrastructure to increase efficiency and safety. The Ray Waterman Regional Water Treatment Center (RWRWTC) was evaluated for these types of improvements in 2009 and several potential improvements were identified. In 2015 the underdrains and filter media at RWRWTC were removed and replaced. The upgrades may support a rerating of the facility from eight MGD to ten MGD, with additional modifications to chemical dosing and pump capacity, however, this would have to be approved by CDPHE, and may be worth pursuing at such time as additional water sources become available. Currently the RWRWTC is supply-

limited; however, treatment capacity is being used to retreat WISE water to a finished water quality that is more consistent with CRW's existing water quality from the facility, then the comingled treated water is sent to customers. Plans are being formulated to use the interconnect with the Pinery to bring 0.25 MGD, initially, of CCPWA fully treated renewable water supplies to the Town's raw water system, to be retreated at RWRWTC for distribution. In the future, up to 1.0 MGD may be available through the Pinery interconnect,

As shown in the Table 2.3 below, the Town's ability to provide treated water is limited by available water supplies, but in combination with water storage, is sufficient to meet max day demands. However, acquiring additional raw water supplies, particularly renewable water supplies, is a high priority and will be driving the capital investment program in the near future. Nevertheless, CRW will continue to invest in deep groundwater wells, either new and/or rehabbed wells, because they are a long-term part of our water portfolio and provide some backup system reliability in times of drought. For example, the WISE supplies are interruptible supplies, so there must be a backup supply to replace those waters if necessary.

Table 2-3 Water Treatment System Capacity

Water Treatment System	Treatment Capacity (MGD)	Raw Water Capacity (MGD)	Treatment or Raw Water Limited?	Firm Pumping Capacity (MGD)[1]
RWRWTC	8.0	6.0	Raw Water	12.0
Founders	3.2	2.7	Raw Water	2.4
Meadows	8.0	4.4	Raw Water	7.0
P.S. Miller	2.0	1.27	Raw Water	1.5
PCWPF	6.0	6.0	Treatment	6.0
Bell Mountain	0.72	0.72	Treatment	1.2
Total	27.92	21.09	**Total Firm Water Pumping Capacity**	30.1

[1]Firm pumping capacity represents the total pump station capacity with the largest pump out of service.

Bell Mountain Water Treatment Plant and/or Crystal Valley Ranch WTP:
In November 2022, the Town entered into an Extraterritorial Services Agreement with the Bell Mountain Ranch subdivision. The 321 home subdivision is in Douglas County, just south of but contiguous to the Town, was a separate community water system that relied 100% on nonrenewable groundwater. BMR had their own WTP, wells, raw and potable water lines, and storage tanks. The subdivision, is however, completely on septic tanks with no sewer collection system. WTP residuals had been discharged to a nearby dry gulch. However, with new regulations, the community system was unable to comply with State water quality requirements for discharge from the WTP. The community needed a long-term renewable water supply solution in addition to significant rehabilitation of its WTP and/or a method to deal with the treatment residuals. CRW has long been cognizant that long-term water solutions

require regional partnerships, and that expansion of the service area, even outside the Town's incorporated boundaries, is sometimes the right thing to do.

Under the terms of the agreement, BMR would pay for capital buy-in and connection costs, and would become CRW customers, similar to the Macanta (Canyons South) subdivision, also in Douglas County. For the purpose of serving BMR, the Town has purchased 1,000 acre-feet of additional WISE renewable water, part of which was previously reserved for other areas of unincorporated Douglas County, which water will be supplied, subject to availability, to help meet the BMR Subdivisions' annual water demand of approximately 144 acre-feet. The Town acquired all BMR water infrastructure, wells and water rights, and will provide service in the same manner as to other CRW customers.

In 2022 CRW initiated a study to evaluate options for either modifications at the existing Bell Mountain WTP or construction of a new 8.0 MGD WTP in the Crystal Valley Ranch (CVR) Loop Road area, with the intent to decommission the BMR WTP when/if a new CVR WTP was constructed. The existing BMR WTP needs significant capital expenditures just to remain in service as a 0.75 MGD plant; capital dollars may be better spent on a new larger plant in CVR that can help meet peak summer irrigation season water demands in CVR and Heckendorf/Lanterns, maybe replace the Miller Water Treatment Plant in the future, and also meet the demands of BMR and the future Dawson Trails development.

The Ridge Estates development in lower CVR needed water storage in a zone higher than existing pressure zones within the CRW service area and needed storage within the Bell Mountain service area. BMR was also short on fire flow storage for its 321 residences within their service area. The developer, BMR and the Town are jointly constructing an additional 0.40 MG storage tank within BMR, and also a pump station and potable water interconnect between CVR and BMR. This interconnect and pump station will allow CRW to provide service to BMR in the future to either make improvements at the BMR WTP for continued service or to decommission the plant altogether once a CVR WTP is constructed.

Construction of a new WTP in the CVR or BMR area has several advantages. Current Lanterns deep groundwater wells could be redirected to the new WTP, making additional capacity available at the PCWPF for surface water supplies that can only be treated at the PCWPF. Wells in the southern part of Town have traditionally been very good producers. CVR, Lanterns, Heckendorf and Dawson Trails will be where much of new growth in the next decade to twenty years is expected to occur. The CVR site is a large parcel, with good road access, and close to distribution piping and available storage in the Tank 15 nearby. An alternatives study completed in Feb 2023 recommended construction of a new WTP in the CVR area over a new facility in BMR; $50 Million has been included in the CIP planning budget for construction of this new WTP.

Corrosion Control

Prompted by the Flint, Michigan water issues (specifically lead leaching from private plumbing), in February 2016 the EPA informed states to enhance the oversight of implementation and enforcement of drinking water regulations such as the Lead and Copper Rule. The Town of Castle Rock had seen rapid growth with a population estimated to be over

62,000 people in 2016. That population number triggered large system requirements in the Lead and Copper Rule and required that a corrosion control study be completed unless the water system could demonstrate that they met criteria to be deemed a system having optimal corrosion control. Based on tap and source water quality laboratory testing completed in 2017, CRW was deemed as having optimal corrosion control treatment by the CDPHE and a corrosion control study was not required.

Water quality within the Town's distribution network has been historically stable, with no action level exceedances of lead or copper since the Town began testing for these compounds in 1992. The Colorado Primary Drinking Water Regulations (5 CCR 1002-11) allows an exemption from completing the corrosion control study for water systems that already meet specific water quality parameters (currently have optimal corrosion control). CRW met those requirements and submitted a request to CDPHE seeking the exemption from completing the study. CDPHE approved CRW's request to be deemed a system having optimal corrosion control (not having to complete the corrosion control study). CRW chose to perform a CCS proactively to evaluate their current treatment processes and to review other potential corrosion control technologies (CCTs), not as a requirement issued by EPA or CDPHE.

In early 2019 CRW was proactive and started a CCS in accordance with the EPA and CDPHE guidelines. Completing a CCS provided CRW with data to assist CRW in continuing the goal of operating a potable water distribution system with optimal corrosion control treatment. In addition, completion of the CCS at that time established a baseline for the water quality in the Town's distribution system against which the quality of future new water sources could be evaluated and compared with.

The corrosion control study included but was not limited to a system-wide water quality evaluation (samples taken at various locations throughout the system for laboratory testing), evaluation of current water treatment methods and possible future changes to treatment or water sources, a review of materials in the distribution system, and an evaluation of corrosion control treatments in the system based on further testing. Study results were used to prepare a report that evaluated potential additional corrosion control treatments (as needed) and compared their ability to reduce lead and/or copper in private plumbing that contains lead and copper. Completing the corrosion control study required additional staff time and various costs, such as those for lab testing and engineering consultant services. In February 2019, CRW contracted with Burns and McDonnell for the CCS at a cost of $84,670; the study was completed in February 2020.

Results showed that the optimal corrosion control technology (OCCT) for PCWPF was zinc orthophosphate (ZOP) addition (just marginally better than pH adjustment), while at Meadows WTP and RWRWTC either ZOP addition or pH adjustment were equally effective. Lead and copper rule requirements designate that a single CCT be used at all treatment sites. There are significant costs associated with ZOP addition at the treatment plants, with marginal additional optimization of corrosion control. Additionally, the addition of zinc orthophosphate would be adding significant amounts of phosphorus which would have implications for wastewater treatment effectiveness at the Plum Creek Water Reclamation Facility (PCWRF). Phosphorus in wastewater from urine, detergents and other cleaning agents, and from fertilizer in

stormwater runoff that infiltrates the collection system, is already a challenge for wastewater treatment without unduly adding it to the potable water. Phosphorus is also a finite resource (worldwide, sources are expected to be exhausted in the next 100 years). At a recommended baseline dose of 3 mg/L as phosphate, the equivalent loading to the wastewater system would be almost 25 pounds per MGD of effluent (currently that would be over 100 pounds per day). The addition to the potable water used for lawns could also impact stream water quality due to runoff, when phosphorus in the Plum Creek and Cherry Creek watersheds is already a huge concern.

In August 2022, the CDPHE reconfirmed CRW's status as having OCCT and revised the water quality monitoring schedule for the CRW. If the Town were required to perform a CCS due to an action level exceedance or other scenario, a new study would probably need to be performed since the water quality sources have changed with the addition of reuse water to PCWPF in 2021 and the treatment processes at PCWPF have changed with the addition of AT processes. CRW will continue to monitor system water quality and report those results to CDPHE and to the public in the annual Consumer Confidence Report (CCR), and will complete a new CCS if so required by the EPA or CDPHE.

Finished Water Storage

Finished water storage is critical for meeting peak demands and fire flow requirements. The Town has sixteen active water storage tanks, with two new tanks under construction for completion in 2023, located in the various pressure zones with a total storage capacity of 38.31 million gallons (MG). Table 2-4 provides an inventory of existing water storage tanks. The Town plans to maintain these existing tanks and add several more as the Town continues to grow. Tank 3, the Town's oldest storage tank, was rehabilitated in 2016, and a replacement tank (Tank 3B) is in the CIP plan. The Town acquired BMR Tanks 20A and 20B in 2022, and began construction of BMR Tank 20C in 2022, for completion in 2023. BMR Tank 20C will provide tan zone storage for Ridge Estates and Planning Area #15 in Crystal Valley Ranch, and will provide for additional fire flow storage for the Bell Mountain Subdivision. Tank 18 (yellow zone) in Cobblestone Ranch is under construction in 2022-2023 and will add an additional 2.0 MG of storage. Other future tanks include a new purple zone tank (Tank 11B) and a new red zone Tank, either collocated at the Tank 14 or Tank 16 site (Tank 16B). Tank 6B has deteriorated to the point that it has been removed from service and will be demolished, and a future tank (Tank 6B Rep) constructed on the site in the future build-out timeline. The Dawson Trails development will need to construct a new Red Zone tank (future Tank 19), and potentially a future Green Zone tank (future Tank 21). See Figure 2.3 for locations of existing and future tanks.

Table 2-4 Finished Water Storage Tank Inventory

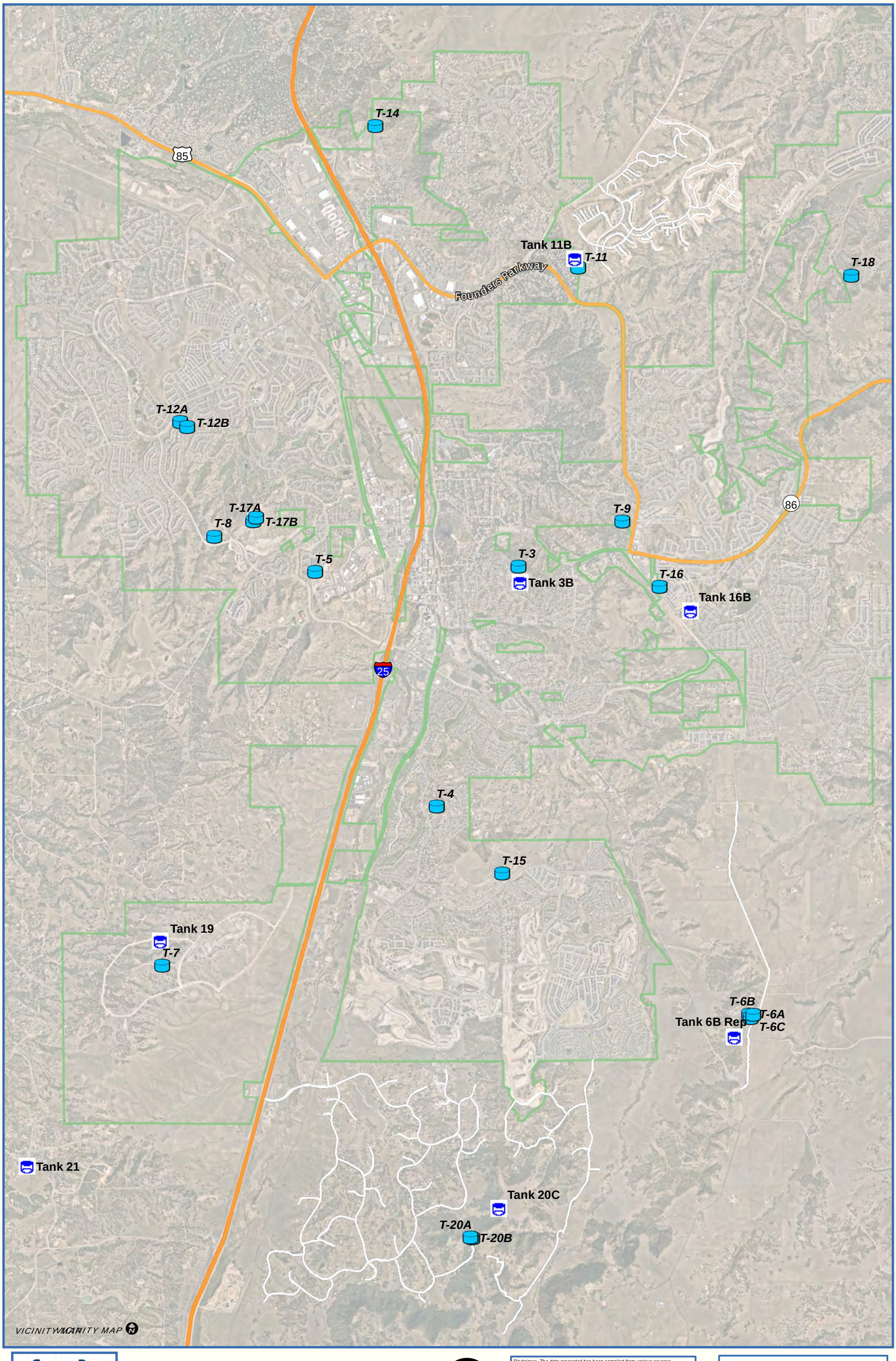
Tank ID	Year Built	Capacity (MG)	Dia (ft)	Height (ft)	Zone	Fire Flow Volume	Fire Vol in Tank	Tank with More Fire Vol	Status
T- 3	1969	1.04	92.6	19.1	Purple	360,000	360,000		A
T- 4	1984	1.51	118.0	18.6	Blue	1,560,000	780,000	T-15	A
T- 5[1]	1984	(0.5)	66.0	19.4	Yellow	390,000	0	T- 8	NIS
T- 6A	1986	2.0	120.0	23.5	Green	960000	480,000		A
T- 6B[2]	1997	(2.0)	120.0	23.5	Green				NIS
T- 6C	2010	2.22	120.0	23.5	Green		480,000		A
T- 7[3]	1986	(2.0)	122.0	22.7	Red	NA	NA	NA	NIS
T- 8	1987	3.13	147.0	24.8	Blue	1,620,000	1,815,000		A
T- 9	1989	1.0	96.0	19.3	Purple	1,200,000	600,000	T -16	A
T- 11	1998	1.0	92.5	24.0	Purple	1,080,000	540,000	T -14	A
T- 12A	1999	3.94	172.0	22.8	Yellow	1,440,000	720,000		A
T- 12B	2007	6.13	172.0	22.8	Yellow		720,000		A
T- 14	2001	2.0	121.0	23.3	Red	600,000	1,440,000		A
T- 15	2002	4.03	174.0	22.7	Red	360,000	1,140,000		A
T- 16	2004	3.11	140.0	27.0	Red	300,000	900,000		A
T- 17A	2005	2.24	136.0	20.6	Red	180,000	90,000		A
T- 17B	2009	2.26	136.0	20.6	Red		90,000		A
T- 18	2022-2023	2.0	132.0	20.5	Yellow	600,000		T -16	UC
BMR 20A	1996	0.21			Tan	240,000	180,000 (current deficit)	20-C	A
BMR 20B	1996	0.09			Tan			20-C	A
BMR 20C	2022-2023	0.40	78.0	11.3	Tan				UC
Total Active Storage Capacity		38.31							

1 Tank 5 is located in Citadel Station and currently is not in service. It has been physically disconnected from the distribution system and its future use will be evaluated.

2 Tank 6B has been removed from service due to a structural failure. This tank is scheduled for demolition in the 5-year CIP.

3 Tank 7 is located in Dawson Trails and currently is not in service. This tank is not intended for future use by CRW.

A = Active; NIS = Not in Service; UC = Under Construction



CASTLE ROCK Qwater
Securing our future drop by drop

0 1,850 3,700 7,400 11,100 Feet

1 inch = 3,667 feet

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CASTLE ROCK WATER
FIGURE 2.3
WATER STORAGE TANKS

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Water Pumping

The Town's water system includes eight booster pump stations and finished water pumps located at each of the WTPs. Water is pumped from WTPs to tanks and directly into the distribution system. Booster pumps provide the ability to move water to a higher zone for storage or distribution. The Ridge Estates pump station is under construction for completion in 2023; it will move green zone water from the Crystal Valley Ranch area up to the new tan zone water storage tank under construction in Bell Mountain Ranch. Several new pump stations are planned for the build-out condition and include a future green zone pump station at Tank 16; and future pump stations in the Dawson Trails planned development (to be built by the developer). See the capital improvements section for more information. Table 2-5 summarizes pump station capacities.

Emergency Backup Power

Generators for three major water treatment plants, capable of supplying enough power during electric service interruptions to meet average day demand, have been installed at Ray Waterman Regional Water Treatment Center (RWRWTC), the Meadows WTP and the Plum Creek Water Purification Facility (PCWPF). In addition, several critical pump stations have back-up generators. Refer to Table 2.5 for more information.

PCWPF

Construction of the original PCWPF was completed and the facility started distributing treated water in spring of 2013. Facility designs included ancillary facilities for connection to a future emergency electrical power generator. An existing 500kW, 480V diesel electric generator from an offline facility was relocated to the PCWPF in 2014. This 500kW generator can supply sufficient power to operate the PCWPF at a flow condition of 2 MGD.

With the Advanced Treatment Expansion at PCWPF in 2020, the new advanced treatment building was outfitted with a 900 kW generator that can power all AT processes up to 12 Mgd. With the next expansion, planned in the next few years, the 500 kW generator will be replaced with a generator that can power the full 12 Mgd capacity of the main treatment building processes. The 500 kW generator will be evaluated for transfer to the O&M building to keep that facility, which operates as a command center, operational during power outages.

Table 2-5 Water Pumping Stations

Pump Station	Zone	Number of Pumps	Total Pump Station Capacity	Firm Pump Station Capacity[1]	Backup Generator
Meadows Blue Zone	Blue	3	4,100 gpm	2,400 gpm	
Meadows Red Zone	Red	2	1400 gpm	700 gpm	150 kW
Citadel [2]	Blue	2	1,600 gpm	800 gpm	
Crystal Valley Ranch	Green	3	2,400 gpm	1,600 gpm	
Diamond Ridge	Green and Red	Green Zone - 5 Red Zone - 2	Green Zone – 2,440 gpm Red Zone – 1,440 gpm	Green Zone - 940 gpm Red Zone - 720 gpm	150 kW
Hillside	Blue	1	800 gpm	0 gpm	
Milestone	Purple	2	3,000 gpm	1,500 gpm	288 kW
Plum Creek South	Red	3	2,190 gpm	1,460 gpm	
RWRWTC	Green and Red	Green Zone - 3 Red Zone - 3	Green Zone – 7,670 gpm Red Zone – 7,425 gpm	Green Zone – 4,270 gpm Red Zone – 4,125 gpm	1,250 kW 1,100 kW
Meadows WTP	Yellow	4	6,550 gpm	4,900 gpm	350 kW
Founders WTP	Green	3	3,400 gpm	2,200 gpm	
PS Miller WTP	Blue	4	4,000 gpm	3,050 gpm	
PCWPF	Yellow	3	6,960 gpm	4,167 gpm	900 kW (AT) 500 kW (2 Mgd)
Bell Mtn WTP	Tan	4	1310 gpm	835	Yes
Ridge Estates (UC)	Tan	2	660 gpm	330 gpm	150 kW (natural gas)

[1]Firm pump station capacity represents the total pump station capacity with the largest pump out of service.
[2] The Citadel PS has been isolated from the distribution system, but could still be used by changing some valve settings in the distribution system.
UC – Under construction 2023

Water Transmission and Distribution

The Town's water transmission and distribution (T&D) network consists of approximately 437 miles of transmission and distribution piping (excluding raw water pipelines), ranging in size from 4 to 42 inches. The majority of the piping is 8-inch and 12-inch diameter in the distribution network. Table 2-6 summarizes the approximate lengths for each pipe size as inventoried in Castle Rock Water's GIS.

Table 2-6 Distribution System Piping

Diameter (in)	Length (miles)	Percent of total
4	1.18	0.3
6	26.0	5.9
8	256.4	58.7
10	2.69	0.6
12	83.24	19.0
16	33.20	7.6
18	5.00	1.1
20	8.61	2.0
24	7.48	1.7
30	8.18	1.9
36	5.15	1.2
Total	**437.13**	**100%**

Notes:

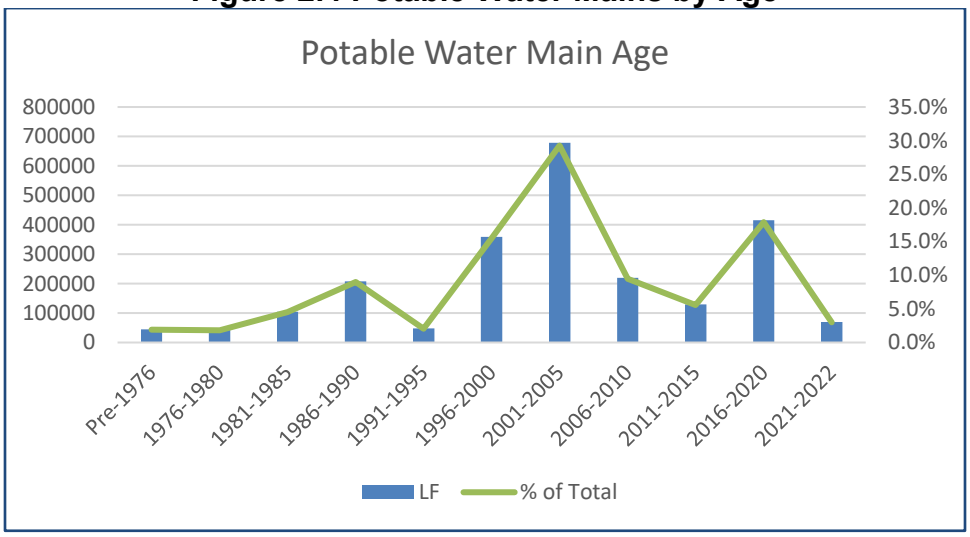
- 36" includes the WISE pipeline; while treated water already, it is retreated at RWWTC
- this does include the newly acquired BMR infrastructure

As shown in Table 2-7, there are almost sixteen miles of Ductile Iron (DI) pipe installed from before 1980 (3.7% of all T&D piping). Of that, almost 63% is smaller diameter four and six-inch pipe, which would not meet current standard criteria and is a priority for capital replacement. See Figure 2.4 for Potable Water Mains by Age and Figure 2.5 for the location of pre-1980 DI pipe.

Table 2-7 Pre-1980 DI Pipe, Potable

Diameter (in)	Length (miles)	Percent of total
4	0.60	3.76%
6	9.47	59.34%
8	3.42	21.43%
12	2.47	15.48%
Total	15.96	**100%**

Figure 2.4 Potable Water Mains by Age



Malibu St

25

VICINITY MAP

CASTLE ROCK Qwater
Securing our future drop by drop

0 470 940 1,880 2,820 Feet

1 inch = 926 feet

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CASTLE ROCK WATER 2023
PRE 1980 WATER PIPES
FIGURE 2.5

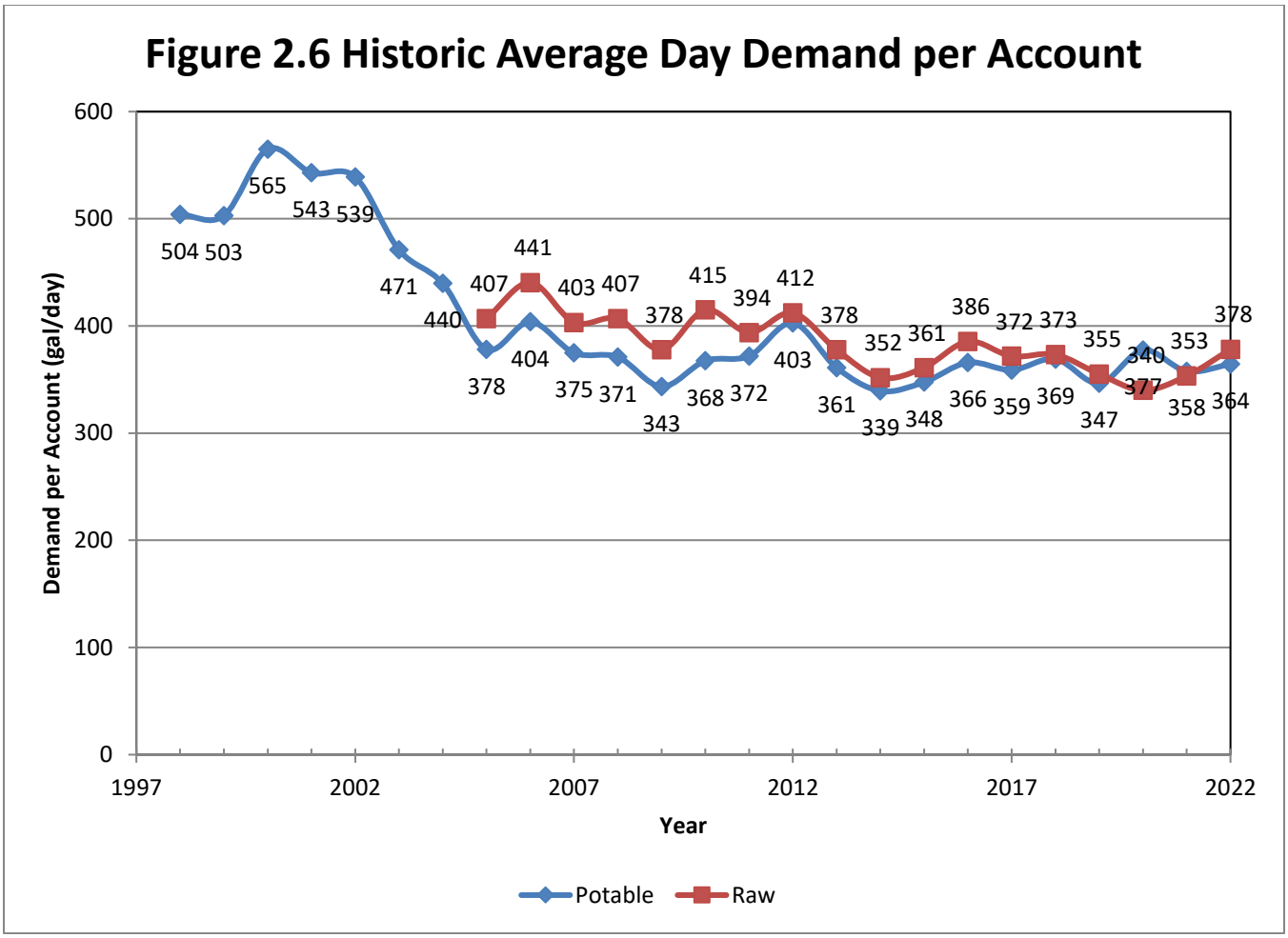
Date: 2/19/2023 Document Path: J:\GIS\Standard Maps\10.6\11x17 Portrait.mxd

Table 2-8 shows the distributed age of distribution piping in the Town's system. Castle Rock Water's system is young by most standards – 58.2 percent has been installed since 2001. With an expected lifetime of 45-50 years, significant capital replacement will need to begin by 2040-2045.

Table 2-8 Water Mains by Install Year

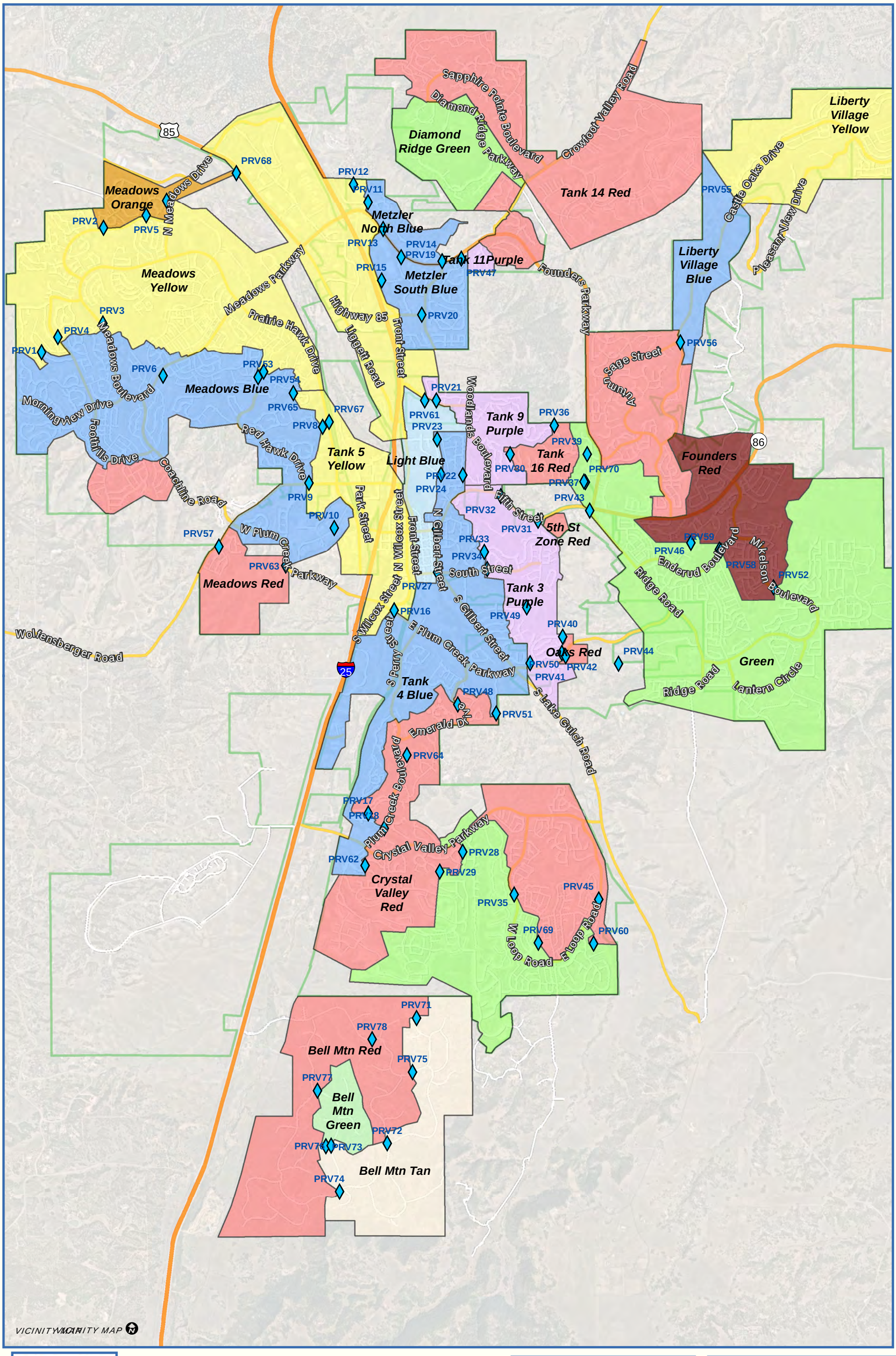
Year	LF	Miles	% of Total
Pre-1976	44666	8.46	1.93%
1976-1980	42115	7.98	1.82%
1981-1985	104764	19.84	4.52%
1986-1990	208023	39.40	8.97%
1991-1995	47873	9.07	2.06%
1996-2000	359308	68.05	15.49%
2001-2005	678630	128.53	29.26%
2006-2010	219220	41.52	9.45%
2011-2015	129077	24.45	5.57%
2016-2020	415313	78.66	17.91%
2021-2022	70038	13.26	3.02%
Total	2319027	439.21	100%

The water transmission and distribution network is sized to handle a conservative maximum peak hour day demand. See Figure 2.6 for a graphic of the historical average day demand (ADD) per account. The figure shows the impact that conservation efforts are having on decreasing average daily demands, but also the effect that dry weather (2012) and increased irrigation has on average demands. Figure 3.4 in Section 3 is an example of the daily diurnal demand chart which illustrates how peak hourly flows fluctuate over the course of the day, showing the impact that irrigation demand has on peak hourly flows.



Pressure Zones and Pressure Reducing Valves

Pressure Reducing Valve (PRV) stations are an integral component of a water distribution system. Due to varying elevations within a distribution system, the system must be divided into pressure zones. With the addition of Bell Mountain Ranch (tan zone), the system now has seven different pressure zones (orange, yellow, blue, purple, red, green, tan). Generally, the pressure within a zone is between 43 psi and 125 psi, depending on the service location relative to the storage tanks that serves the zone. The pressures within these pressure zones are regulated and maintained by tank levels, complicated pressure sensors and valve systems (PRVs, of which there are 73 active PRVs in the Town's distribution system; there may be multiple PRVs at a single location). Figure 2.7 shows the various pressure zones in the Town of Castle Rock and the location of PRVs.



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CASTLE ROCK WATER
FIGURE 2.7
PRESSURE ZONES AND PRVs

Date: 3/9/2023 Document Path: J:\GIS\Standard Maps\10.6\11x17 Portrait.mxd

Regional Projects:

WISE Partnership and WISE Local Infrastructure:

The Town of Castle Rock is a member of the South Metro WISE (Water Infrastructure and Supply Efficiency) Authority formed in 2013 and has a 2,000 Acre-Feet/year subscription (1,000 AF initially, and in 2018 CRW purchased 1,000 AF that had been reserved by Douglas County). The WISE project is a component of the Town's hybrid project concept that spreads out the costs over several generations but secures a renewable water supply in the near term for existing customers and development in the future. The project is based largely on the utilization of available Denver Water and Aurora Water reusable return flows available in the South Platte River downstream of Denver and excess capacity in Aurora's Prairie Waters Project. Construction began in late 2016 on 5.3 miles of 36-inch pipeline to convey WISE waters from a connection with Parker Water and Sanitation District. The project was completed in 2018. After nine years of planning and more than $50 million in infrastructure, CRW began importing WISE water on schedule in April 2018. Agreements for conveyance and cost sharing are in place with PWSD and other WISE partners. The Town plans to fully utilize WISE deliveries when they are available and minimize the use of deep groundwater wells. If WISE supplies are available that can't be put to beneficial use, the plan is to first store the excess through ASR, and then in Rueter-Hess Reservoir. Ideally, although this is treated water, the Town retreats it prior to sending to distribution to ensure outstanding water quality and disinfection residual. CRW also plans to retreat WISE waters prior to ASR storage. Castle Rock has developed partnerships with PWSD, DWSD, and Pinery WWD for design, construction and implementation of infrastructure necessary to deliver WISE water between the Western Pipeline and the Town. This additional infrastructure includes the Ridgegate Pipeline, the Canyons Pipeline, the Outter Marker Road Pipeline and the Parker Midsection Pipeline (constructed starting in 2023).

Future projected WISE investments and projects (per the 2021 WRSMP) have a current price tag of over $144 million and include:

- Expand the Parker WSD Reuter-Hess Water Purification Facility (RHWPF) with 12 MGD of reserved capacity for CRW;
- Binney Connection;
- WISE DIA connection;
- Salinity Reduction Treatment Facilities;
- PWSD Midsection Pipeline;
- WISE pump station expansion (at PWSD)
- WISE Phase 2 Pipeline - future parallel Outter Marker Road to Ray Waterman RWTC pipeline.

The WISE Pipeline during Construction

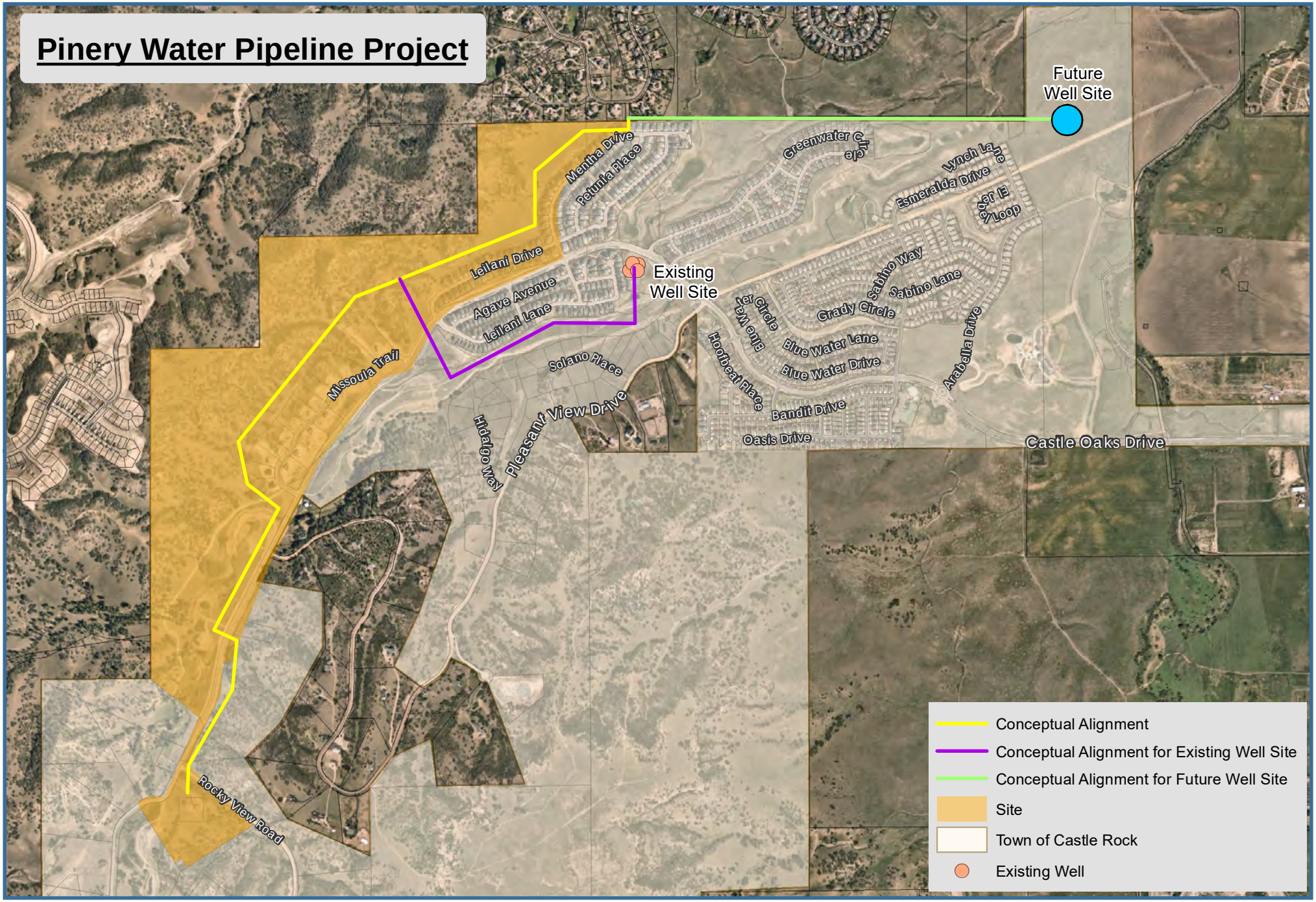
Pinery Interconnect
The Pinery Interconnect was constructed in 2013. The Town and the Denver Southeast Suburban Water and Sanitation District (the Pinery) installed a 12-inch pipeline between the two districts. The project included a flow meter and flow control valve to regulate the flow of water between the two distribution systems. The project was designed to move up to 2 MGD between the two distribution systems in the case of an emergency. CRW is planning a pipeline along the Castle Oaks Drive between The Pinery and Castle Rock's system. This pipeline will transfer from the Pinery between 0.25 to 1.0 MGD of non-groundwater directly under the influence (GWDUI) water to the Ray Waterman Regional Water Treatment Center (RWRWTC). CRW will retreat the water due to differing water quality between CRW and Pinery treated water prior to sending it to distribution.

The Pinery uses a water treatment chemical called AquaMag in their potable water distribution system. AquaMag is a blend of poly and orthophosphate used to sequester iron and manganese in the potable water. Since Pinery does not filter out iron and manganese, AquaMag helps keep these constituents in solution so they do not become an aesthetic problem. When water containing AquaMag mixes with water not treated with the product, some iron and manganese may come out of solution due to the slightly higher sequestering demand. CRW uses greensand filtration processes to remove iron and manganese down to very low levels in our treated water. There are concerns that mixing the two source waters in the distribution system could result in iron and manganese being released from their sequestered state into solution, which could cause laundry and fixture staining in customer's home. CRW would prefer to maintain the high water quality standards that its customers are used to. Rather than constructing a new treatment station in the Cobblestone Ranch neighborhood, CRW could send the Pinery water to the RWRWTF using existing raw water lines. The RWRWTF is a groundwater facility with greensand filtration. If CRW sent the Pinery water to the RWRWTC, we could better control the water quality entering the distribution system.

The Town has a few existing well sites near the proposed pipeline. The pipeline and pump station option will give the Town the flexibility to tie-in these wells in the future. See Figure 2.8 for an exhibit of the proposed Pinery Interconnect pipeline.

Castle Pines Interconnect
The Castle Pines Interconnect was constructed in 2014. The Town and the Castle Pines Metropolitan District installed a twelve-inch pipeline between the two districts. The project included a flow meter and flow control valve to regulate the flow of water between the two distribution systems. The project was designed to move up to two MGD between the two distribution systems in the case of an emergency. To date, an emergency situation has not required activation of the interconnect.

Pinery Water Pipeline Project



Castle Rock Water — Securing our future drop by drop

0 1,000 2,000 4,000 Feet

Date: 1/25/2023 1 inch = 1,500 feet

FIGURE 2.8

VICINITY MAP

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Dominion Water and Sanitation District Wheeling Infrastructure
On May 15, 2018, the Town entered into a Cost Sharing IGA with Dominion Water & Sanitation District (Dominion) for the design and construction of the Plum Creek Raw Water Return Pipeline (PCRWRP) jointly with Dominion's Eastern Regional Pipeline Project (ERPP). The Town's pipeline extended from our Plum Creek Diversion near Sedalia approximately 6 miles back to town, connecting this renewable water source to our PCWPF raw water supply lines. Dominion's ERPP paralleled the PCRWRP from Sedalia back to the town, connecting to existing potable distribution lines near SH85 and the Outlets shopping complex. A control and metering vault with SCADA was also constructed. The PCRWRP was completed in late 2020, in time to send water to the AT processes at the PCWPF. To date, Dominion has not requested that any water be wheeled through the system to their connection in Sedalia.

Cherry Creek Project Water Authority (CCPWA) - Walker Reservoir
Walker Reservoir is a proposed CCPWA water storage project, located northwest of Franktown. The project will provide 650 AF of storage which will be filled from a combination of future alluvial and deep wells near the reservoir and is to be stored for use during high demand periods. CRW's portion of the storage capacity is 150 AF. The water that is stored in the reservoir will be discharged into Cherry Creek by the project pump station to be picked up downstream by project members.

The CCPWA contracted for the reservoir construction in 2021 for $11.6 million. The project includes a slurry wall surrounding the reservoir that is constructed up to 80 feet deep and into bedrock to provide a watertight seal from the water in Cherry Creek. At the end of 2022, mass excavation for the reservoir was approximately 30% complete with 152,000 of 475,000 cubic yards complete. All rebar, pipes, and pumps are onsite and electrical equipment is currently stored off-site. Project completion is expected in the fall of 2023. The well construction (3 alluvial and 1 Arapahoe deep well) that will supply the reservoir, started in March 2023.

Walker Reservoir under construction

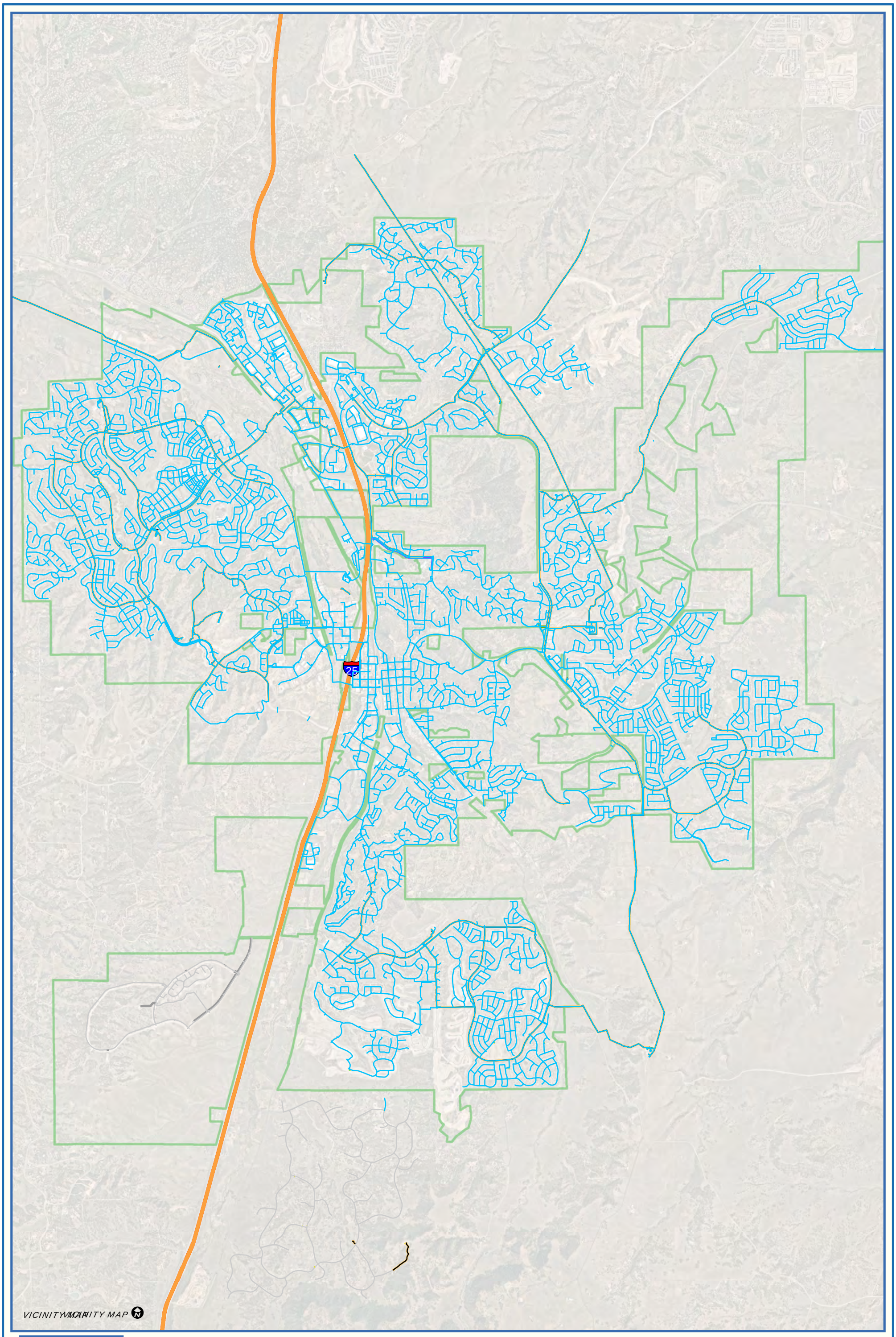
3. Hydraulic Modeling

A hydraulic model of the water transmission and distribution system is a powerful tool for predicting future conditions in the network, solving pressure issues, making adjustments in day to day operations, and modeling "what if" scenarios. The Town's potable water hydraulic model was originally created in 2009 using Innovyze InfoWater software. The hydraulic model is updated annually with the addition of new infrastructure installed into the distribution system. The most recent update was performed in early 2022. The distribution network is geographic information system (GIS) based and the model is tied to Castle Rock Water's GIS mapping. The distribution network was mapped and field verified using handheld global positioning system (GPS) equipment. Elevations are accurate to the nearest three to five feet and horizontal location is accurate to the nearest 0.5 foot. As new infrastructure is added to the Town, it is imported into Castle Rock Water's GIS, field verified and adjustments within the mapping are made accordingly. Elevations and coordinates for features recorded on record drawings are assumed to be as accurate as the recorded information. Figure 3.1 represents the current water infrastructure within the Town's service area.

In order to accurately model the water system, a model was built based on Castle Rock Water's mapping and then calibrated. The hydraulic model was calibrated using operating data collected via SCADA (Supervisory Control and Data Acquisition) between September 2, 2009 and September 5, 2009. Additional fire flow tests were conducted during this period to improve the accuracy of the C factors (pipe roughness coefficients) used in the model. The comparison between the hydraulic model data and the SCADA data show good correlation. This original hydraulic model was validated by a third party, URS. Refer to the 2010 Water Master Plan Update, Appendix D.

The water distribution system is designed based on the dynamic hydraulic model. Future growth demands are based on an average day demand (ADD) of 265 gpd/SFE to reflect the updated landscape and irrigation requirements for new homes starting in 2023. The model was run simulating a maximum day demand continuously for 41 consecutive days. The distribution system had to be able to maintain tank levels and the required pressures in the distribution system at all times during the simulation. Pump stations were sized to convey the water throughout the distribution system under each simulation. Demands for Bell Mountain Ranch were included in the model; the pipes themselves will be included in the 2023 modeling update.

The hydraulic model is updated annually with new demand data along with the new infrastructure. Billing data is analyzed to determine how the system demands are distributed throughout the system. The data from July 2022 was used to populate the demands in the model. The billing data from July 2022 was selected because the summer months have demands for all of the irrigation accounts that are active. This allows these demands to be more accurately distributed in the model. Using the latest possible billing data provides for the most accurate list of accounts and their distribution throughout the distribution system.



CASTLE ROCK water
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0 2,100 4,200 8,400 12,600 Feet

1 inch = 4,167 feet

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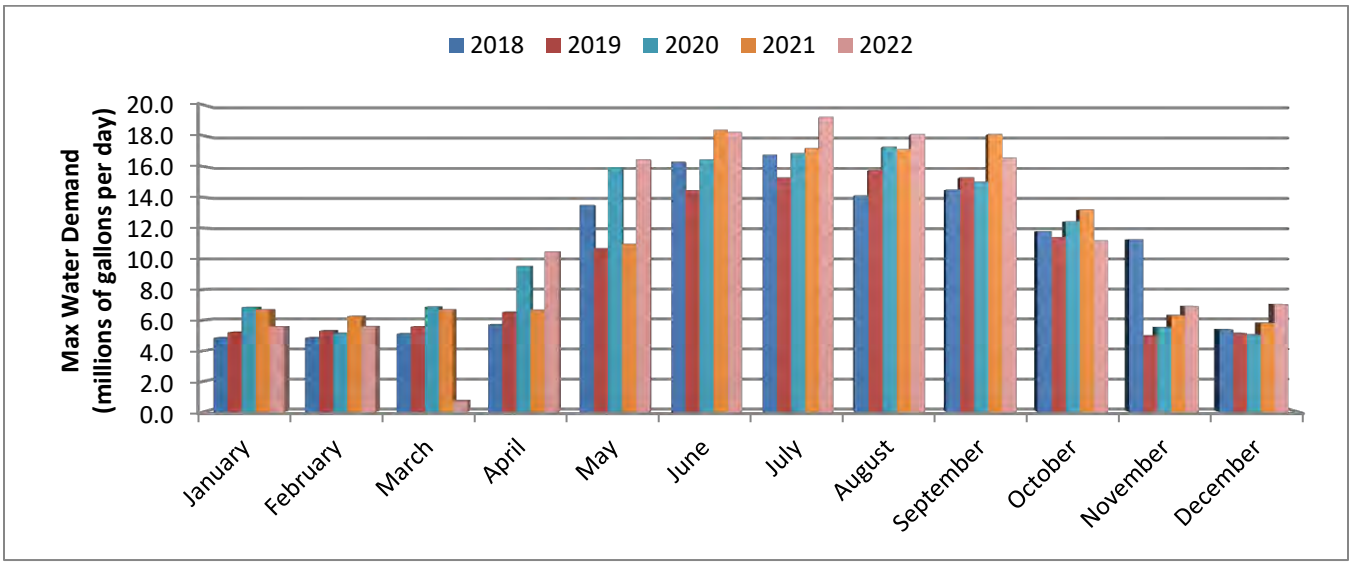
CASTLE ROCK WATER
FIGURE 3.1
HYDRAULIC MODEL

Date: 3/1/2023 Document Path: J:\GIS\Standard Maps\10.6\11x17 Portrait.mxd

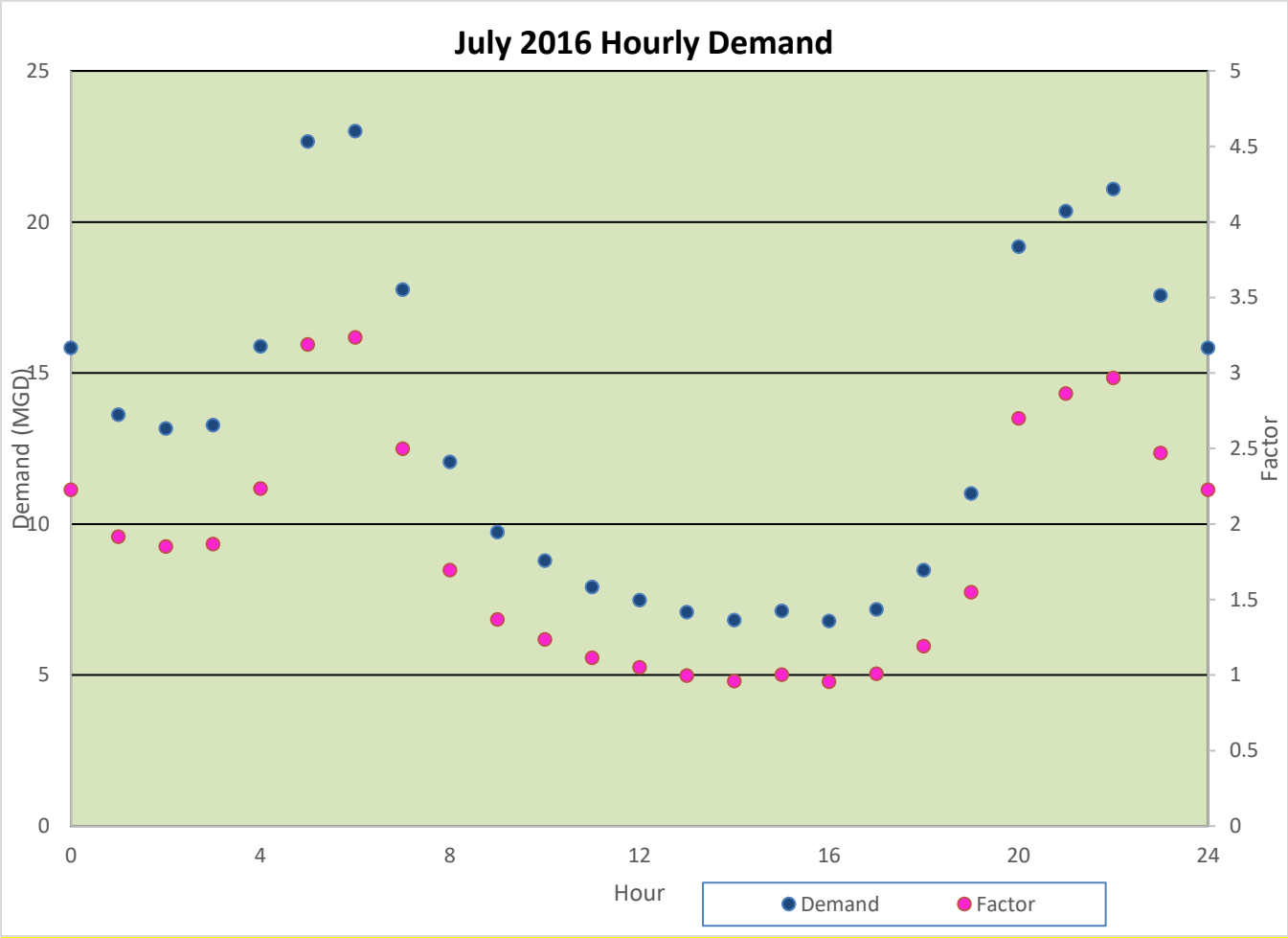
Unfortunately, the billing data only provides monthly water demands for each account. The operational SCADA data is used to convert the billing data into a maximum day demand (MDD) for the model. The billing data was factored up by the ratio of the SCADA average day demand (ADD) to the daily average demand of the billing data. Then the data was factored up by the ratio of the MDD to the ADD from the SCADA data. Once the billing data was converted to MDD, it was imported into the model to generate the current MDD model for 2022. See Figure 3.2 for monthly max day water demands for 2018 to 2022.

Figure 3-2: Historic Monthly Water Demand (peak day demands)

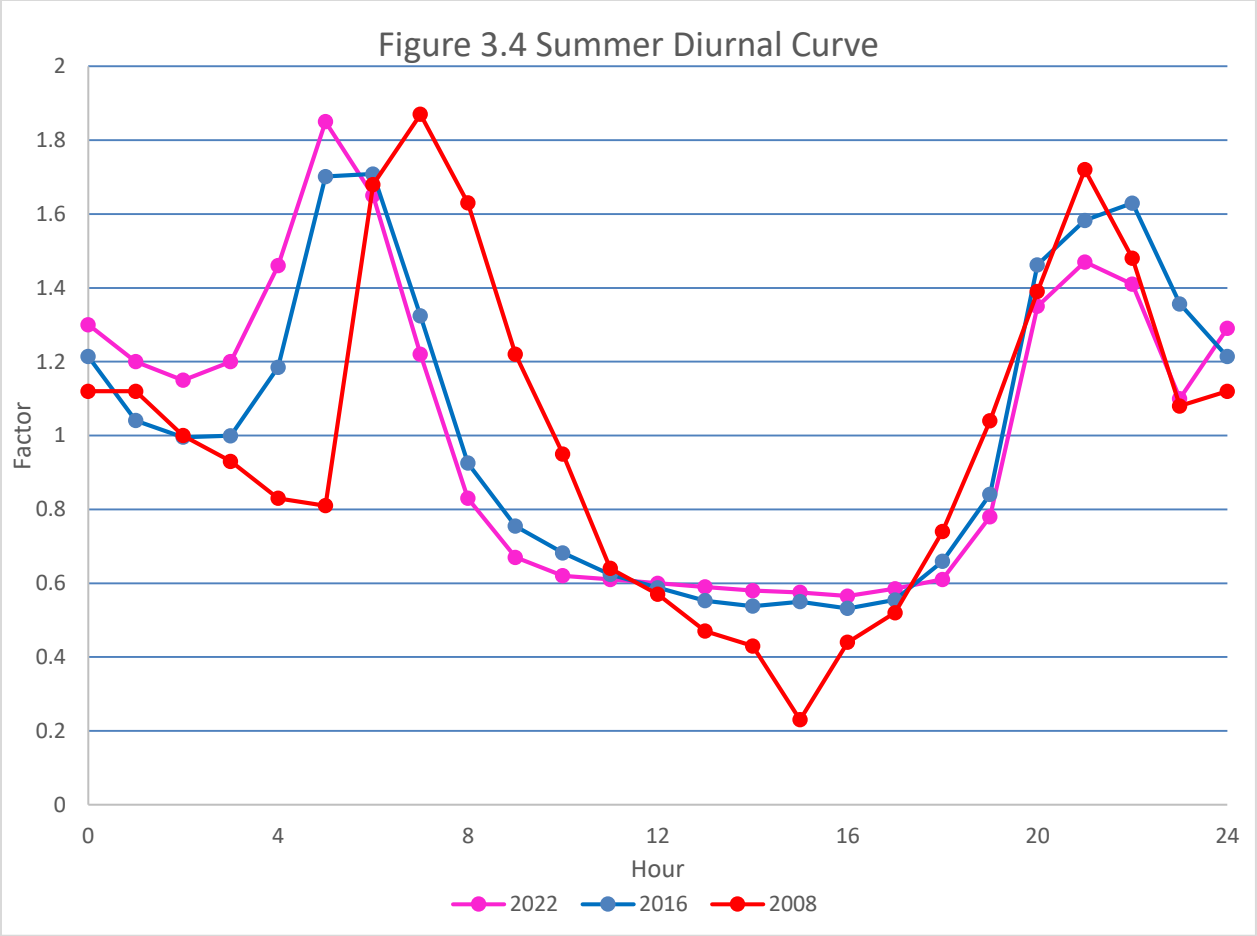


The July 2022 SCADA data was used to generate a summer diurnal curve and determine the peaking factors for maximum day and peak hour demands. The annual average daily demand for 2022 was 9.38 MGD, the minimum was 4.07 MGD, and the maximum was 19.22 MGD. Based upon this data, the maximum day to average day factor was set at 2.5 and the peak hour to average day factor was set at 5.5, which are factors that have not changed from the previous Water Master Plan. The peak hour factor was calculated based on SCADA data collected during 2016. The data from July 2022 was used to calculate an hourly demand for every hour in July. The demands for each hour were then averaged and then divided by the average daily demand (ADD) for 2016. The resulting peak hour factor was approximately 3.0. The data for July 2016 is shown in Figure 3.3.

Figure 3.3



A similar approach was used to generate a water demand diurnal curve that was used for maximum day modeling. The July 2022 SCADA data was collected and used to calculate the hourly demand for each hour in July. The demands were averaged for each hour and then divided by the average daily demand. The resulting diurnal curve for 2022, compared to the original 2008 diurnal and 2016 diurnal, is shown in Figure 3.4. The shift in the 2022 curve to the left as compared to the 2016 curve reflects changes to the watering windows for both the commercial and residential irrigation schedule.



The hydraulic model used for this master planning effort was based upon the calibrated maximum day demand model. This model is an extended period model using the diurnal curve shown above and simulating a maximum day demand over thirty consecutive days.

Water supplies were again obtained from the latest Water Resources Master Plan and the existing distribution system was evaluated. The projects that were identified in the modeling effort are a result of the future growth, the transition from a non-renewable water supply to a renewable water supply, and changes to the landscape regulations in 2022. Model predictions are the basis for sizing components of the water distribution system. As the Water Resources Master Plan evolves, adjustments may be required for transmission lines to convey those water sources into Town. The distribution network within Town also depends on certain infrastructure being constructed by development. The Town looks for opportunity to upsize planned pipes to meet future needs. However, there is always the possibility that the need for larger pipes could occur before developer contributed infrastructure is built, in which case the Town may need to construct new distribution or transmission lines or upsize existing pipes, and potentially seek developer reimbursement. Refer to Section 4 for discussion of future CRW CIP and developer required projects.

Three separate hydraulic models were created to model the distribution system at different time intervals during the future planning horizons. The first model created represents the system at the end of the five-year planning horizon. The projects identified in the five-year planning horizon are associated with the new renewable water supplies identified in the Water Resources Master Plan.

The second model created represents the system at the end of the ten-year planning horizon. System demands were estimated using the same approach as described in the five-year model. Again, available water supply estimates were obtained from the Water Resources Master Plan for the ten-year planning horizon. The existing distribution system was evaluated to determine whether improvements are required to distribute the available water.

The third model created represents the build-out condition of the planned growth for the Town. The modeled water demands are based on existing demands, planned development within the Town boundary, and areas that are most likely to be annexed and/or served in the future. For planning purposes, it makes sense to assume that infill areas someday will be part of the Town through annexation. Additionally, the area to the south of Town in the rust color is Bell Mountain Ranch and the Town began serving this area through an intergovernmental agreement effective in 2022. Other areas which are not included in the high use scenario that eventually could be served by CRW include Silver Heights and Castleton Center, shown in green in the Figure 3.5 as separate water districts. Other impacts on future water demands include future annexations, nearby water districts that may request service and redevelopment of certain geographies such as the implied consent area of Town.

The system was modeled using water demand from existing billing data and growth projections as shown in Figures 3.6 and 3.7. Available estimated water supplies from the Water Resources Master Plan were used as input to the existing and future water treatment facilities.

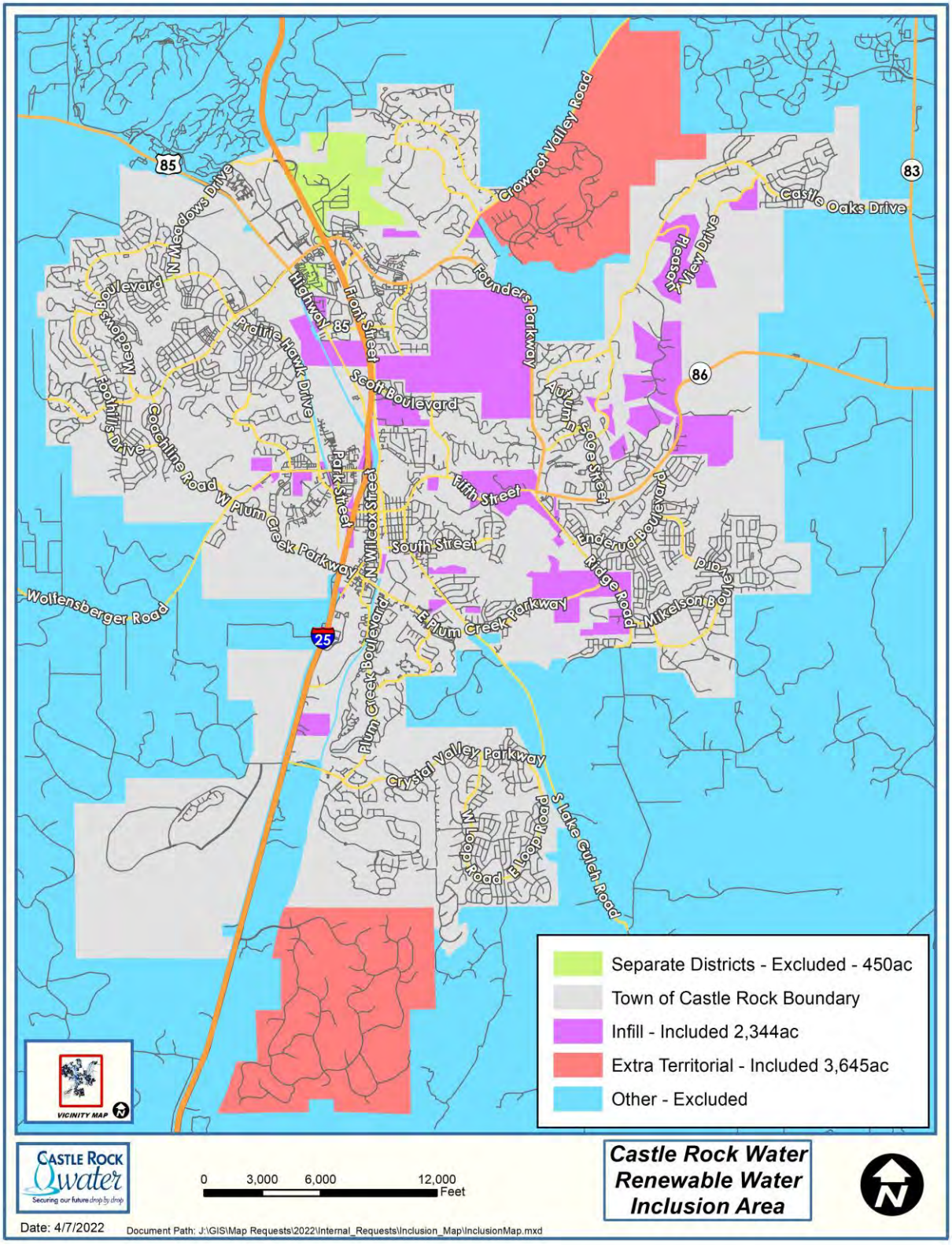


Figure 3.5 Renewable Water Inclusion Map

The assumed build-out planning numbers, by planning area, are shown in Figures 3.6 and 3.7. Projecting future growth values can be difficult, but Town planners currently project a future built-out population of 122,000 people. However, if existing entitlements build to 100%, the future population (by 2050) could be as high as 140,000 with future annexations and extraterritorial service adding a demand equivalent of an additional 15,000 people. For planning purposes, we estimate high-case and low-case scenarios to encompass a range of possibilities. In order to plan for varying scenarios, CRW has identified that projected demands could be as low as 12,546 AF under the high water conservation scenario of 100 gpcd, and 112,000 people versus 23,439 AF under a low water conservation scenario of 135 gpcd with 155,000 people. The base scenario is 118 gpcd at a population of 122,000, and corresponds to a projected demand of 16,126 AF by 2050 (note the assumption that once a built-out population is reached, no more population growth is planned).

FIGURE 3.6 BUILD-OUT PLANNING NUMBERS

Data through December 31, 2022, please note that these are estimates, and numbers are subject to change

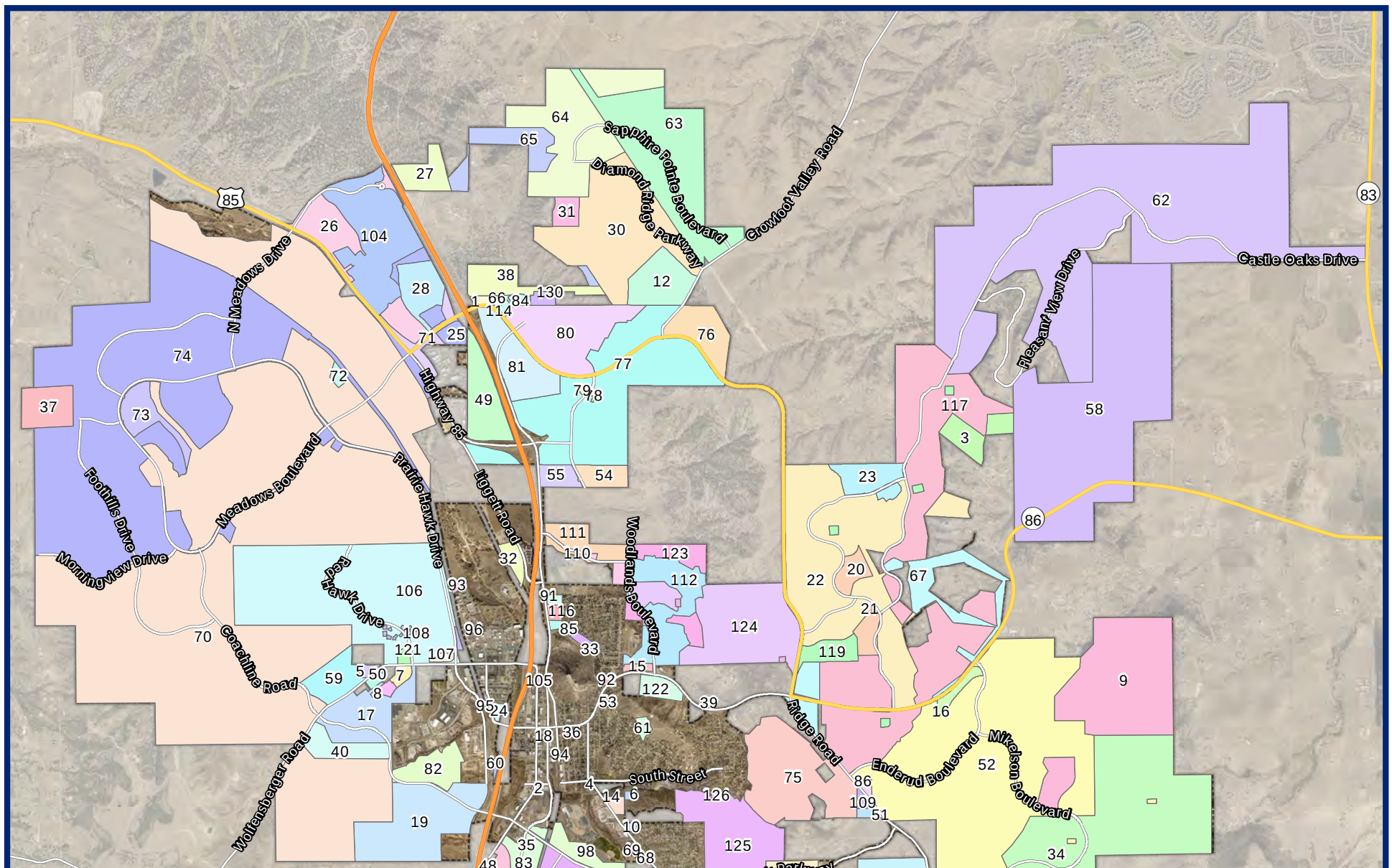
		MAXIMUM ZONED UNITS			PLATTED (SF) SDP (MF)				UNITS BUILT (CO)			Potential HIGH Buildout				Potential LOW Buildout			
PD #	Planned Developments (year initially zoned)	SF	MF	Total	SF	MF* SDP	MF platted, no SDP	Total	SF	MF	Total	SF	MF	Total	delta from Max Zoned	SF	MF	Total	delta from Max Zoned
130	Alexander Place (2020)	26	99	**125**	0	0	0	**0**	0	0	**0**	0	134	**134**	9	26	99	**125**	0
5	Arbors (2002)	38	80	**80**	0	0	no	**0**	0	0	**0**	0	80	**80**	0	38	0	**38**	-42
7,8	Auburn Ridge (2013)	0	286	**286**	0	286	no	**286**	0	186	**186**	0	286	**286**	0	0	266	**266**	-20
12	Brookwood (2003)	72	0	**72**	72	0	n/a	**72**	62	0	**62**	72	0	**72**	0	72	0	**72**	0
16	Cambridge Heights (2003)	0	100	**100**	0	0	no	**0**	0	0	**0**	0	63	**63**	-37	35	0	**35**	-65
17	Castle Highlands (1984)	132	200	**332**	131	200	no	**331**	127	200	**327**	131	200	**331**	-1	131	200	**331**	-1
19	Castle Meadows (1989)	0	440	**440**	0	0	no	**0**	0	0	**0**	0	1500	**1500**	1060	0	400	**400**	-40
3,20,21,22,23,117	Castle Oaks /Terrain (2002)	1992	775	**2767**	2172	0	no	**2172**	2101	0	**2101**	2277	0	**2277**	-490	2277	0	**2277**	-490
25,26,27,28,104	Castle Pines Commercial / Promenade (1987)	0	1410	**1410**	0	1362	no	**1362**	0	1062	**1062**	0	1362	**1362**	-48	0	1362	**1362**	-48
29	Castle Ridge East (1996)	30	0	**30**	28	0	n/a	**28**	28	0	**28**	28	0	**28**	-2	28	0	**28**	-2
30,31	Castle Rock Estates - Diamond Ridge (1995)	126	0	**126**	126	0	n/a	**126**	126	0	**126**	126	0	**126**	0	126	0	**126**	0
33,87,88,89,90	Castleview Estates - The Oaks of Castle Rock (1985)	248	326	**574**	239	0	no	**239**	241	0	**241**	367	0	**367**	-207	367	0	**367**	-207
34	Castlewood Ranch (1998)	1300	0	**1300**	1292	0	n/a	**1292**	1282	0	**1282**	1292	0	**1292**	-8	1292	0	**1292**	-8
straight zones, downtown	Central Castle Rock (varies) NO maximum zoning**	1538	3462	**5000**	1533	1437	redevelop-ment potential	**2970**	1535	1188	**2723**	1538	3962	**5500**	500	1538	2962	**4500**	-500
40	Covenant At Castle Rock (2014)	58	0	**58**	58	0	n/a	**58**	58	0	**58**	58	0	**58**	0	58	0	**58**	0
42,43,44,45,46	Crystal Valley Ranch (2000)	2670	753	**3423**	3051	0	no	**3051**	2502	0	**2502**	3051	96	**3147**	-276	3051	0	**3051**	-372
47	Dawson Ridge (1986)	2447	5453	**7900**	0	0	no	**0**	0	0	**0**	3408	2445	**5853**	-2047	2400	1600	**4000**	-3900
52,9	Founders Village - Inc. Founders 24 and Bella Mesa (1985)	2776	2905	**5681**	2634	0	no	**2634**	2597	0	**2597**	3345	0	**3345**	-2336	3234	0	**3234**	-2447
54,55	Hazen Moore (2000)	243	0	**243**	161	0	n/a	**161**	161	0	**161**	161	0	**161**	-82	161	0	**161**	-82
56,57	Heckendorf Ranch (1985)	406	224	**630**	404	0	no	**404**	299	0	**299**	404	0	**404**	-226	404	0	**404**	-226
59	Hillside (2009)	120	0	**120**	54	0	n/a	**54**	0	0	**0**	120	0	**120**	0	120	0	**120**	0
118	Lanterns (2003)	1200	0	**1200**	940	0	n/a	**940**	268	0	**268**	1200	0	**1200**	0	1200	0	**1200**	0
62	Liberty Village (2004)	1245	0	**1245**	1238	0	n/a	**1238**	1081	0	**1081**	1238	0	**1238**	-7	1238	0	**1238**	-7
63,64,65	Maher Ranch (1988)	923	100	**1023**	767	96	no	**863**	771	96	**867**	767	96	**863**	-160	767	96	**863**	-160
70,72,73,74	Meadows (1985)	6867	4002	**10869**	7357	555	yes (12.799 acres in TC)	**7912**	7231	555	**7786**	7434	1055	**8489**	-2380	7422	555	**7977**	-2892
75	Memmen Young Infill (1985)	559	476	**1035**	0	0	no	**0**	0	0	**0**	710	0	**710**	-325	600	0	**600**	-435
76,77,78,79,80	Metzler Ranch (1996)	1037	660	**1697**	751	660	no	**1411**	742	580	**1322**	751	660	**1411**	-286	751	660	**1411**	-286
97,98,99,101,103	Plum Creek (1983)	3025	0	**3025**	1188	360	n/a	**1548**	1189	360	**1549**	1188	360	**1548**	-1477	1188	360	**1548**	-1477
100	Plum Creek Ridge (2006)	92	70	**162**	120	0	no	**120**	120	0	**120**	120	0	**120**	-42	120	0	**120**	-42
102	Plum Creek South (1985)	307	198	**505**	140	0	no	**140**	137	0	**137**	140	0	**140**	-365	140	0	**140**	-365
106,107,108	Red Hawk (1996)	660	268	**928**	887	0	no	**887**	821	0	**821**	887	0	**887**	-41	887	0	**887**	-41
129	Ridge Estates (2020)	52	0	**52**	52	0	0	**52**	0	0	**0**	52	0	**52**	0	52	0	**52**	0
110,111	Scott II (1987)	85	220	**305**	78	220	no	**298**	78	220	**298**	78	220	**298**	-7	78	220	**298**	-7
113	Sellers Landing PD (1982)	0	94	**94**	0	82	0	**82**	0	77	**77**	0	82	**82**	-12	0	82	**82**	-12
115	Stanbro PD (1987)	32	92	**124**	0	0	no	**0**	0	0	**0**	32	92	**124**	0	16	46	**62**	-62
119	Villages at Castle Rock / Echelon (1981)	12	542	**554**	0	238	no	**238**	0	0	**0**	12	238	**250**	-304	0	238	**238**	-316
121	Wolfensberger - formerly Graham PD (1996)	0	56	**56**	0	56	no	**56**	0	56	**56**	0	56	**56**	0	0	56	**56**	0
122,123,124,112	Woodlands - Inc. Scott Ranch (1983) Woodlands Crossing (1987)	990	0	**990**	551	0	n/a	**551**	537	0	**537**	605	0	**605**	-385	605	0	**605**	-385
125,126	Young American (1983)	78	1138	**1216**	375	186	no	**561**	375	186	**561**	1012	186	**1198**	-18	825	186	**1011**	-205
		ZONED UNITS			PLATTED (SF) SDP (MF)				UNITS BUILT (CO)			Potential HIGH Buildout				Potential LOW Buildout			
		* MF counts shows approved by SDP																	
		SF	MF *	Total	SF	MF*	MF platted, no SDP	Total	SF	MF	Total	SF	MF	Total	delta from Max Zoned	SF	MF	Total	delta from Max Zoned
TOTAL UNITS		31,386	24,429	55,777	26,399	5,738		32,137	24,469	4,766	29,235	32,604	13,173	45,777	(10,000)	31,247	9,388	40,635	(15,142)
POPULATION ESTIMATES		95,413	48,858	144,271	80,253	11,476		91,729	73,178	9,532	82,710	99,116	26,346	125,462	(18,809)	94,991	18,776	113,767	(30,505)

*Castle Meadows does not have a maximum cap in the zoning, however 440 MF units was listed in the most recent traffic study for this property. This property could develop with more or less residential units.

**Central Castle Rock includes straight zoned land as R-1, R-2, R-3, and B zone areas in the Downtown Overlay that allow multifamily. There is no maximum cap in the zoning, so land area and typical densities have been used to determine the area could develop out at 5,000 units.

*** Dawson Trails rezoning was approved by Council in the 3rd Quarter of 2022 (formally Dawson Ridge). As this report is through September 30, 2022, the Dawson Trails zoning documents had not been recorded, therefore theDawson Ridge numbers are shown. Once the zoning documents have been recorded the report will be updated to reflect the new Dawson Trails zoning.

FIGURE 3.7 PLANNING AREAS



Planned Development Zoning

An illustration of the names and boundaries of all Planned Developments and Amendments. There is no significance represented by the colors used except to delineate boundaries. Numbers in table do not represent chronological order of Planned Development approvals. There are two types of zoning mapped within the Town: Standard Zone districts and Planned Development (PD) districts. Standard Zoning consists of a series of pre-established districts. The criteria for these zone districts (permitted uses, setback requirements, and maximum building heights) remain the same, no matter where the zone is located. Standard Zoning is an historic approach to land use management and is still in effect for the core of Town, which refers to the older downtown area and nearby residential areas. Each Planned Development district is unique and relates to a development plan that was prepared specifically for that property (typically large properties). All "newer" communities situated within the Town are zoned PD. For a detailed explanation of zoning requirements, specific to either Standard or PD Zoning districts, refer to Title 17 of the Town of Castle Rock Municipal Code.

0 0.25 0.5 1
Miles

Disclaimer: The data presented has been compiled from various sources, each of which introduces varying degrees of inaccuracies or inconsistencies. Such discrepancies in data are inherent and in supplying this product to the public the Town of Castle Rock assumes no liability for its use or accuracy. For questions or comments regarding omissions, corrections, or updates please visit CRgov.com/directory for contact information.
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Coordinate System: SPCS Colorado Central (0502)
Projection: Lambert Conformal Conic
Datum: North American 1983
Units: Foot US
Creation Date: 10/15/2020

Legend

1. 1-25 AND FOUNDERS PKWY CONOCO PD
2. 18 WILCOX PD
3. 1ST AMD TO CASTLE OAKS PRELIM PD SITE PLAN AMD 1
4. 710 SOUTH STREET
5. ARBORS PD
6. ASPEN MEADOWS PD
7. AUBURN RIDGE PDP NO.1
8. AUBURN RIDGE PDP NO.1 AMD 1
9. BELLA MESA PDP
10. BISHOP COURT PD
11. BROOKSIDE BUSINESS CENTER AMENDED
12. BROOKWOOD PD
13. BURT AT CASTLE ROCK PD
14. BW SQUARED PD
15. CALVARY CHAPEL PDP
16. CAMBRIDGE HEIGHTS PD
17. CASTLE HIGHLANDS MAJOR MODIFICATION
18. CASTLE MANOR PD
19. CASTLE MEADOWS INTERCHANGE OVERLAY PDP
20. CASTLE OAKS AMEND NO. 1 PPD, 2ND
21. CASTLE OAKS AMEND NO. 1 PPD, 3RD
22. CASTLE OAKS AMENDMENT NO. 1
23. CASTLE OAKS ESTATES PDP NO. 1
24. CASTLE PARK SOUTH PD
25. CASTLE PINES COMMERCIAL AMENDMENT (1995)
26. CASTLE PINES COMMERCIAL AMENDMENT (2000)
27. CASTLE PINES COMMERCIAL MAJOR MODIFICATION
28. CASTLE PINES COMMERCIAL PD
29. CASTLE RIDGE PD
30. CASTLE ROCK ESTATES I AMENDMENT
31. CASTLE ROCK ESTATES II PD
32. CASTLE ROCK MARINE PD
33. CASTLEVIEW CONDOMINIUMS PD
34. CASTLEWOOD RANCH MINOR AMENDMENT
35. CENTRE ON PLUM CREEK FLG 2 AMENDED
36. CHRISTS EPISCOPAL CHURCH PD
37. CHURCH OF THE ROCK PD
38. COOPER-HOOK PD
39. COUNTRY ACRES PD
40. COVENANT AT CASTLE ROCK PDP
41. CREEKSIDE PD
42. CRYSTAL VALLEY RANCH 2ND AMENDMENT
43. CRYSTAL VALLEY RANCH 4TH AMENDMENT
44. CRYSTAL VALLEY RANCH MAJOR AMENDMENT
45. CRYSTAL VALLEY RANCH PDP AMENDMENT NO. 5
46. CRYSTAL VALLEY RANCH PDP AMENDMENT NO. 6
47. DAWSON RIDGE AMENDMENT
48. DEMIS PD
49. DOUGLAS COUNTY JUSTICE CENTER MAJOR MODIFICATION
50. EPIPHANY EVANGELICAL LUTHERAN CHURCH OF CASTLE ROCK PD
51. FAITH LUTHERAN CHURCH PD
52. FOUNDERS VILLAGE AMENDED (1986)
53. GANNON MED/DENTAL PD
54. HAZEN MOORE AMENDMENT
55. HAZEN MOORE PDP NO. 1
56. HECKENDORF RANCH AMD NO.1
57. HECKENDORF RANCH PDP AMD NO.4
58. HERITAGE FARM PD
59. HILLSIDE PDP
60. KREFT PD
61. LARRYS PD
62. LIBERTY VILLAGE 2ND AMENDMENT
63. MAHER RANCH MAJOR AMENDMENT (PHASE 1)
64. MAHER RANCH MAJOR AMENDMENT (PHASE 2)
65. MAHER RANCH PD
66. MAIN PLACE PD
67. MALL AND OFFICE CENTER INFILL
68. MASTER MAGNETICS 2 PD
69. MASTER MAGNETICS PD
70. MEADOWS FOURTH AMENDMENT
71. MEADOWS PARKWAY PD
72. MEADOWS PDP NO. 1
73. MEADOWS PDP NO. 2
74. MEADOWS THIRD AMENDMENT
75. MEMMEN YOUNG INFILL
76. METZLER RANCH 2ND MAJOR AMENDMENT
77. METZLER RANCH PD (1996)
78. METZLER RANCH PD 5TH AMENDMENT
79. METZLER RANCH PPD 4TH AMENDMENT
80. METZLER RANCH THIRD MAJOR AMENDMENT
81. MILESTONE OFFICE CAMPUS AMENDED (1998)
82. MILLER'S LANDING INTERCHANGE OVERLAY PDP
83. MILLER RANCH PD
84. MONTANA VISTA PDP
85. MOUNTAIN SHADOWS PD
86. MT. ZION LUTHERAN CHURCH PD
87. OAKS OF CASTLE ROCK AMD NO.1
88. OAKS OF CASTLE ROCK AMENDMENT NO. 3
89. OAKS OF CASTLE ROCK AMENDMENT NO. 4
90. OAKS OF CASTLE ROCK PD
91. OAKWOOD APARTMENTS PD
92. OAKWOOD PARK PD
93. OMNI STORAGE PD
94. P S MILLER HOUSE
95. PARK STREET BUSINESS CENTER II PD
96. PD (ORD# 3.60 & 3.61)
97. PLUM CREEK AMENDED
98. PLUM CREEK FIRST AMENDMENT
99. PLUM CREEK POINTE AMENDMENT
100. PLUM CREEK RIDGE PD
101. PLUM CREEK SECOND AMENDMENT
102. PLUM CREEK SOUTH PD
103. PLUM CREEK WEST PD
104. PROMENADE AT CASTLE ROCK PDP
105. Q-PETROLEUM PD
106. RED HAWK AMENDMENT NO. 1
107. RED HAWK CROSSINGS PDP NO. 1
108. RED HAWK PD
109. RIDGE VIEW PD
110. SCOTT II AMENDED
111. SCOTT II MAJOR MODIFICATION
112. SCOTT RANCH PD
113. SELLERS LANDING PD
114. SHOPPES ON FOUNDERS
115. STANBRO PD
116. STONE CREEK APARTMENTS PD
117. TERRAIN PDP
118. THE LANTERNS AMENDMENT NO. 3
119. VILLAGES AT CASTLE ROCK PD
120. WESTFIELD TRADE CENTER AMENDMENT
121. WOLFENSBERGER PDP
122. WOODLANDS CROSSING PD
123. WOODLANDS MINOR MODIFICATION
124. WOODLANDS SECOND AMENDMENT
125. YOUNG AMERICAN PD
126. YOUNG AMERICAN SECOND AMENDMENT
127. YOUR STORAGE CENTER AT CASTLE ROCK PDP
128. YOUTH FOR CHRIST PD
129. RIDGE ESTATES
130. ALEXANDER PLACE PD

4. Capital Improvement Program

Summary of Previous Master Plan Projects

The 2017 Water Master Plan had identified three planning horizons for capital improvement projects (CIPs), and identified priority projects for each phase. We will discuss the projects from the five-year 2018-2022 planning horizon, and discuss whether projects were completed, delayed, or removed from the CIP plan altogether. Several projects were completed as rehabilitation projects, emphasizing the importance of maintaining CRW assets. Other projects may have been delayed due to changes in the development plan, or changed due to changes in future requirements (for example, changes in the landscape and irrigation regulations, which emphasize the importance of revisiting the model and the CIP plan each year).

2018-2022 Planning Horizon – Projects Not Completed

Tank 6B demolition

Tank 6B has deteriorated to the point that it has been removed from service and will be demolished, and a future tank (Tank 6B Rep) constructed on the site in the future build-out timeline. Demolition was originally budgeted $250,000 as a project for 2018, however, staffing limitations due to many projects, a lack of regional knowledge and experience with demolition of post-tensioned tanks, and concerns with the budget being insufficient, have delayed completion of this project. The project is in the CIP schedule for 2023 at a revised budget of $600,000.

Tank 11 to Pine Canyon (not constructed; Pine Canyon development not approved yet)

Future infill annexation of the Pine Canyon and Pioneer Ranch will require a transmission line from the purple zone tank. The developer must install a pipeline to serve the Pine Canyon development and initial planning documents indicate the size will be 16 inches; however, it has been identified that a future twenty-inch transmission may be required. The Town would pay to upsize the waterline from 16 to 20 inches. This project was not completed because the Pine Canyon development has not been approved by the Town. It is still budgeted in the CIP for future buildout phase, dependent upon approval of the Pine Canyon/Pioneer Ranch developments.

Young American Valve Replacement

A project to repair/replace older valves and add new valves at critical locations. The cost for this project was estimated at $160,000. The project was not completed due to budget constraints at the time. The area has been identified for future pipeline replacement in the Waterline Rehab Plan (draft 2022) which will also include replacing and adding water valves to the area. The design for a replacement project will begin in 2023 with construction planned in 2024. The project may be phased due to size of the area and budget constraints.

2018-2022 Planning Horizon – Completed Projects from 2017 Water Master Plan

Distribution System Upgrades

Upgrades to the distribution system include the automation of key PRVs to help with the efficient flow of water through the distribution network, the addition of and rehabilitation of valves and fire hydrants in older neighborhoods, and minor piping projects to help with connectivity and distribution of water within and between pressure zones. Other improvements include rehabilitation projects to improve reliability and decrease ongoing maintenance. The annual budget for this work is $250,000.

Distribution system upgrades projects completed from 2017 to 2022 include:

- Milestone Pump Station PRV – This project was identified in the 2017 WMP. Upgrades were made to the original PRV, installed in 2002, to add an automated valve which would allow operations staff to move more WISE water from the Terrain area down into the Meadows. This project was completed in 2022 as part of the Terrain Control Valve project to gain economies of scale by combining two smaller projects into a larger project. Project cost for the PRV was $57,274.
- Oakwood and Mt. Royal PRV Improvements - This project completed in 2019 included the replacement of two existing PRV vaults: The Oakwood PRV located near the intersection of Mountain View Drive and Oakwood Drive and the Mt. Royal PRV located near the intersection of Mt. Royal Drive and Plum Creek Boulevard. Both PRV vaults were constructed in the late 1980s. Both vaults were not constructed per today's Town's standards. The vaults were constructed without solid floors, which allowed groundwater to periodically flood the vaults. The flooding had caused corrosion to the valves and piping within the vaults. The design of the existing vaults also made repairs difficult due to a lack of adequate working space. The new vaults were constructed with adequate space to work in and with solid concrete floors, per our current standard detail. In addition, each vault includes a sump to collect and remove any groundwater or leaks from the piping. Project cost was $355,575.
- Terrain Control Valve - The red pressure zone on the east side of Town is supplied with water from the Ray Waterman Regional Water Treatment Center (RWRWTC). The east side red pressure zone has two tanks associated with it, Tank 16 and Tank 14. Tank 16 is located near the King Soopers along Ridge Road, and Tank 14 is located at the north end of the Diamond Ridge subdivision. When the high service pumps at RWRWTC pump into the red zone, water more easily flows into Tank 16 due to its closer proximity to RWRWTC. Eventually, Tank 16 would overflow before Tank 14 is filled, preventing full utilization of the storage capacity of Tank 16. The Castle Oaks Control Valve was installed in 2003 to restrict the flow of water into Tank 16. Unfortunately, this also restricts the flow of water out of Tank 16 and into the distribution system. The restricted flow in and out of Tank 16 can result in water quality issues in the tank. The Terrain Control Valve is located along Founders Parkway, just north of Crimson Sky Drive. It was designed to work with the existing Castle Oaks Control Valve to direct the water produced at RWRWTC between the two red zone tanks, Tank 14 and Tank 16, and balance the system demand on both tanks. With the addition of the new Terrain Control valve, the two valves divided the existing red zone into two zones, essentially with a

storage tank dedicated to each zone. The project was completed in 2022 at a cost of $242,742.

Raw Water Supply

Castlewood Ranch 1 Deep Wells

Two, new deep Denver basin groundwater wells were constructed in 2017-2018, near Matney Park in Castlewood Ranch. The water supply goes to the Founders WTP. Projected was completed in time for 2018 summer demand. Project cost: $2,296,000.

Castlewood Ranch 1 Well Facility (aka: the Founders Wells Raw Waterline and Well Facility from the 2017 WMP)

A new well facility and approximately 5,200 linear feet of eight-inch raw waterline was constructed to transfer groundwater from the new Castlewood Ranch 1 Deep Wells to the Founders Water Treatment Plant (FWTP) for treatment. The well facility included a flow meter vault, electrical, variable frequency drive, and control panels. The facility also included the yard piping from each well and pump to waste pipe. The contractor also constructed a new 8-inch transmission main between the well facility and an existing raw water transmission main. The well facilities and pipeline were constructed in the first half of 2018. This project was completed in 2018 at a cost of $5.5 million.

Lanterns Deep Groundwater Wells, Facility and Raw Water Pipeline

Three, new deep groundwater wells were constructed in the Lanterns area. The project consists of the three wells, controls and meter facilities, as well as a transmission pipeline to convey the water to the PCWPF. The wells, in the Dawson, Denver and Arapahoe formations, are expected to produce an average of 1.2 million gallons per day.

The raw water transmission pipeline from the new Lanterns Well Facility connected to an existing raw water transmission main located on the west side of East Plum Creek. The raw water transmission main had some unique challenges associated with the pipeline construction. The new pipeline crossed the Union Pacific Railroad (UPRR) and East Plum Creek. The creek and railroad are within 100-feet of each other but have an elevation difference of about thirty feet. A Horizontal Directionally Drilled (HDD) pipe installation was identified as the only reasonable method to cross these obstructions. The railroad regulations required that the new pipeline be installed within a steel casing pipe under their right-of-way. For this project, the casing pipe and carrier pipe were assembled above ground and installed together in a single pull. The raw water transmission pipeline was completed in May 2019; the well facility was completed in early 2020 due to electrical equipment delays. The total project (wells, facility, raw waterline pipe) cost was 5.5 million.

Heckendorf Raw Waterline Replacement Project

The Heckendorf Raw Waterline replacement project was an unplanned project. The exposed raw waterline was discovered during a bank stabilization project in 2017 to protect an existing sewer interceptor. The raw waterline had been exposed due to shifting of the creek alignment and was at risk of damage or failure, which could have removed approximately 1.8 MGD of raw water supply from conveyance to the PCWPF. The raw waterline conveyed water from the Heckendorf wells to the PCWPF, and would also convey the future raw water supply from

the new Lanterns wells to the PCWPF. The replacement line was designed in 2018 and added to the budget. The line was proactively replaced in 2019 at a project cost of $627,890.

Exposed Heckendorf Raw Waterline in East Plum Creek

BMR Denver Well Rehab

In 2018 CRW staff repaired and operated the newly acquired Denver well at the Bell Mountain Wellfield. This well water is pumped into East Plum Creek and is recovered downstream by the Castle Rock 1 Diversion (CR-1) for treatment at the Plum Creek Water Purification Facility. The well was acquired with the acquisition of the United Water Assets in late 2017.

New RWRWTC groundwater wells and ASR

In 2022, construction began on two additional deep groundwater wells at the RWRWTC with ASR capability to store excess WISE water. Supply chain issues have delayed completion of those wells, and final EPA approval is expected in 2023. Typical ASR wells have a maximum injection rate of 80% of the average pumping rate. Based on the information available, staff believes that up to a total of 600 AF/yr of renewable water could be stored in the two existing ASR wells in the Meadows and the two new ASR wells at RWRWTC.

Storage

Liberty Village Yellow Zone Tank (Tank 18)

The Cobblestone Ranch subdivision (formerly known as Liberty Village) currently is served through a long transmission main that crosses three pressure zones. A 2 MG water storage tank was identified to provide dedicated storage for maximum day demand plus fire flow in this area. The project is under construction in 2022 for completion in 2023 and the contracted cost is $3,246,000. The Cobblestone developer is required by a development agreement for the area to construct almost a mile of 16-inch pipeline to send water to and from the proposed tank to the distribution system; construction on the developer pipeline is expected in 2023.

Transmission

Highway 85 Transmission (completed in 2019)

During the planning process for the 2017 Water Master Plan, the Highway 85 Transmission Project was identified in the 2018-2022 planning horizon. Castle Rock Water added WISE water as a new source of supply in 2018. WISE water subscription rates would increase yearly for the next few years after that. The WISE water enters the water distribution system at the Ray Waterman Regional Water Treatment Facility (RWRWTF). The water flows throughout the Town based on the needs of the system. The 2017 master planning effort identified a restriction in the movement of water from the RWRWTF to the Meadows and Promenade subdivisions. The master planning effort identified the Highway 85 Transmission Main Project to eliminate this restriction.

The Highway 85 Transmission Main Project installed a new 20-inch main between Justice Way and Meadows Parkway. The new pipeline ties into existing stubs located at Meadows Parkway, Industrial Way and Justice Way. About 2,045 linear feet of 20-inch waterline was installed to complete the transmission loop just north of Liggett Road in order to move additional WISE supply around Town as demand increases. The cost for the project was $693,687 and it was completed within budget.

Tank 18 Blue Zone Transmission

Transmission main to provide second source of water to Tank 18. This project will eliminate a long dead-end transmission main. The Town began construction in 2022, for completion in early 2023, the 1.55 mile, 16-inch water supply pipeline to the new tank to provide a second source of water and to eliminate a long dead-end transmission main serving the Cobblestone development. Project cost of $4.1 Million.

Pumping:

Blue Zone Pump Station Upgrade

In 2018, Pump 1 at the Blue Zone Pump Station under-went extensive improvements in order to meet increasing pumping demands. The station was originally built with two large pumps and a smaller jockey pump. Staff contracted with Water Technology Group to replace the smaller pump with a full size pump, along with the motor, piping, and variable frequency drive, circuit breaker, conduits, and wiring. After completion, the pump station will have three pumps serving as two primary and one backup configuration capable of 4,100 gpm. The cost of this project was $40,271.

Ray Water Regional Water Treatment Center Red Zone Pump Upgrades

The Ray Waterman Red Zone high service pumps supply water to Tanks 14 and 16. These pumps are critical to supplying water during the summer peak demand season. Castle Rock Water's engineering staff determined that due to increasing population growth and the need to move WISE water flows through the distribution system, the pumps should be replaced with higher capacity pumps, in order to meet current and future demands. Plant mechanics took the lead to complete the pump upgrades. This upgrade increased the total capacity of the Ray Waterman Red Zone Pump Station by a total of 1,165 gpm, resulting in additional pumping capacity of 1.66 MGD. The project was completed in 2020 at a project cost of $96,875.

Ray Water Regional Water Treatment Center Green Zone Pump Upgrades

Castle Rock Water's engineering staff determined through hydraulic modeling that due to increasing population growth and future increases in WISE water flows, the Ray Waterman Green Zone pumps should be upsized with higher capacity to better meet current and future demands. Furthermore, with expected increases in WISE water imported flows, larger high service pumps were needed to move the additional water throughout the Green Zone distribution system. The two new Green Zone pumps were sized to increase pumping capacity from 2,780 gpm to 3,400 gpm, each. These improvements completed in 2021 increased the total Green Zone pumping capacity by 1,240 gpm or 1.78 MGD.

In 2021, CRW plant maintenance staff pulled one pump at a time for replacement; shipping each pump a vendor for disassembly and rebuild. Upgrading one pump at a time allowed the facility pump station to continue to operate normally during the pump upgrade process. The cost of this project was $79,292.

Green Zone Pump Replacement at the RWRWTC

Treatment:

Meadows WTP Rehab

A critical equipment upgrade was completed at the Meadows Water Treatment Plant with the replacement of 24 obsolete valves and electric actuators on Filters 5-8. The Meadows plant operates eight filters as part of the treatment process. Each filter has six valve-actuator pairs for control of flow and backwashing of the filters. Castle Rock Water pre-purchased 24 Valmatic valves matched to AUMA actuators from Pipestone Equipment, which a contractor installed. The project required extensive pipe rigging, electrical wiring, training, startup, and testing. The work completed a two-year project to replace all 52 filter valves and actuators.

These improvements ensure the Meadows plant is properly equipped to operate at full capacity and meet its eight million gallons per day demand.
The cost of the project was $205,342.

Media Replacement
Water treatment media replacement is budgeted to replace and/or supplement media every five years, alternating among the treatment facilities, or as needed. $500,000 is budgeted every five years, and includes contractor services and disposal of spent media. In 2021, CRW added additional anthracite media to the filters in the Founders WTP and the PS Miller WTP. Some media can be lost over time during filtration and backwash processes, and a facility may only need media augmented, not fully replaced. Project cost was $38,000.

PCWPF Membrane Addition
The Plum Creek Water Purification Facility (PCWPF) Membrane Project (water filtration system) was completed in May 2017, with work being finished on schedule and budget. This was an expansion of the existing 4 MGD Pall system, which added one membrane rack equal to 2 MGD of treatment capacity, increasing total plant production capacity to 6 MGD. The contractor was Moltz Construction and the cost of the project was $990,000.

Miller Water Treatment Plant
The Miller Water Treatment Plant, which was disconnected from the Town's water system in 2012 just prior to the PCWPF coming online, underwent extensive rehabilitation to be returned to service and be ready as a peaking plant for the 2019 summer pumping season. The improvements included: replacement of the clearwell hatch, the re-drill and replacement of wells W15 and W16, the rehabilitation of the chemical feed equipment for the sodium hypochlorite and ammonia disinfectant systems, the new installation of two new chlorine analyzers, the excavation and sealing of the electrical room wall to prevent water infiltrating beneath the motor control center, and improved SCADA programming. This water treatment plant rehabilitation, which spanned 2017 into 2019, cost $209,535. Costs were kept to a minimum because much of the work was performed in-house. This project was not identified in the 2017 WMP. Bringing the facility back into service has provided redundancy to the treatment processes and ensured growing peak summer demands can be met.

Staff inspecting the upgraded Miller Water Treatment facility.

PCWPF Advanced Treatment Processes

In December, 2017, the Town awarded a Design Consultant Agreement in the amount of $1,455,320 to Burns & McDonnell Engineering Co., Inc. for the design of the Plum Creek Water Purification Facility (PCWPF) Advanced Treatment Project upgrades. This renewable water project supports the Town's long-term water goal of providing a 75 percent renewable water supply for the community by the year 2050. The advanced treatment upgrades project consisted of treating collected renewable surface water sources from East Plum Creek. Design of the PCWPF Advanced Treatment processes centered on a multiple barrier approach to treat the new source water for removal of pathogens, organics, regulated drinking water contaminants, and non-regulated contaminants of emerging concern (CECs). The advanced treatment processes include ozone, biologically active carbon filtration, granular activated carbon filters, and UV disinfection. The primary goal of the PCWPF Advanced Treatment Project was to meet or exceed requirements of the U.S. EPA Safe Drinking Water Act, as well as anticipated additional requirements from the Colorado Department of Public Health and Environment (CDPHE).

In general, the PCWPF Advanced Treatment Project included a new one-million-gallon raw water blending tank, an ozone system for advanced oxidation, a biologically activated carbon (BAC) filter conversion, granular activated carbon contactors, an ultraviolet disinfection system, facilities for onsite handling of solids, and a new 1,250kW generator to provide emergency electrical power for the AT processes.

Following design and CDPHE approval, the construction project was awarded to Garney Construction using two separate work packages. Town Council awarded Work Package 1 (WP1) in December 2018, and Work Package 2 (WP2) in May 2019. WP1 included purchasing advanced water treatment systems and construction of a one-million-gallon raw water blending tank. WP2 included construction of a new building to house the new treatment equipment, a backwash solids settling tank, a raw water meter vault, converting the existing PCWPF

greensand filter to a biologically active carbon filter, and all other associated facilities and equipment to complete the project.

Once the PCWPF Advanced Treatment Project was completed it began treating collected renewable surface water from Plum Creek. Surface water is pumped by the Plum Creek Diversion Pump Station to PCWPF from CRR1 in Sedalia through the Plum Creek Raw Water Return Pipeline. The Advanced Treatment processes at PCWPF use a multiple barrier treatment approach to treat this new water source. These systems are designed for removal of pathogens, organics, regulated drinking water contaminants, and nonregulated CECs. The project was completed at a cost of $28,452,538 (within budget), in early 2021. The facility began treating renewable water in early 2021.

Waterline Rehabilitation and Replacement

Johnson Drive, Place and Court Waterline Replacement (Summer 2017)

The project consisted of replacing 1,675 linear feet of six-inch cast iron pipe with eight-inch PVC pipe. In addition to replacing the aging water main, the project added nine additional valves, four additional hydrants, and a water quality sample station. The additional valves reduce the number of customers that will have disrupted service in the event of a main shut down, and enhance the fire protection reliability by reducing the number of fire hydrants that may be out of service during a repair or other shutdown. The street was also lacking fire hydrants required by current design criteria, and the old six-inch pipe could not convey an adequate fire flow of 1,500 gpm. The pre-existing water main did experience a break during construction, further emphasizing the need for this project.

The original waterlines were installed in 1975 (without bedding material and corrosion protection that are now required) and had a history of breaks that had caused significant damage to the streets. Pipelines typically are designed for a fifty-year life and this pipeline was more than forty years old. The project was completed ahead of major road reconstruction by the Public Works department; Project cost was $268,123.

Gordon Drive Improvements Project (July 2020)

Castle Rock Water and the Public Works Department partnered to complete infrastructure improvements along Gordon Drive, in the Memmen subdivision, to address stormwater flows along the surface of the roadway. An underground storm sewer to capture and convey approximately one hundred acres of on-site and off-site flows to minimize street flooding and bring the roadway up to current standards for drainage was critical infrastructure constructed as part of the project.

Existing water and sewer infrastructure in the neighborhood was approximately forty years old, and the water lines were undersized to meet current standards. In order to construct the storm sewer, modifications to the existing sanitary sewer and water lines were necessary. CRW proactively replaced remaining sanitary sewer services and water lines along Gordon Drive, Gordon Court, Gordon Place and Gordon Lane as part of the project. Improvements also included reconstruction of the roadway from an inverted crown to a standard crown with catch curb and gutter along Gordon Drive, between Johnson Drive and Gordon Lane, as well as full depth pavement reclamation of the remainder of Gordon Drive, Gordon Court, Gordon Place and Gordon Lane. Construction kicked off in April 2019 and was completed by July 2020. The $2.8 million project was

jointly funded through the Stormwater, Water and Wastewater Enterprise Funds, and the Transportation Fund.

Glovers Waterline Replacement 2019-2022 (two phases; phase 1 complete in 2021; second phase complete in 2023)

Over 10,550 linear feet of old six inch cast iron pipe was replaced in the Glovers neighborhood, in two phases over a three-year period. The pipe was old, undersized 6 inch cast iron pipe, had a history of breaks, was over forty years old, and was due for replacement.

During Phase 1 construction of the new water mains, the pavement began to fail. The pavement was less than three inches thick in most areas, and appeared to be original pavement from the 1970s. The pavement was not holding up well to the street cuts and heavy equipment and was no longer a candidate for patching back. The area was scheduled for pavement reconstruction in 2027, under the Pavement Maintenance Program (PMP) managed by Public Works (PW). CRW was planning a follow-on project in 2025 to replace aging sewer service laterals in advance of the future road reconstruction by PW. However, with the pavement scope expanded to require full replacement in 2021 in the Phase 1 project area, Castle Rock Water decided to expedite replacement of the sewer service laterals and include them in the project scope of work for completion in 2021, in advance of repaving at completion of the project. This was to avoid having a patched roadway network if the sewer service laterals were delayed to a future year. The Phase 1 project cost was $3,025,215, with over $650K of reimbursement from PW for the roadway reconstruction.

Phase 2 of the project, completed in 2022 replaced approximately 7,000 feet of six-inch cast iron pipe with an eight-inch PVC pipe. The Phase 2 project also replaced all of the water service lines and sanitary sewer laterals within the roads. Once the utility portion of the project was completed, Public Works reconstructed the road with full-depth reclamation. The total project cost was $3,000,000 and was completed within the approved budget. Public Works will reimburse Castle Rock Water $289,000 for the road and sidewalk rehabilitation. The project was completed ahead of schedule.

Craig and Gould North Infrastructure Improvements (scheduled for completion in 2023)

The Craig and Gould North Infrastructure Improvement Project is the second phase of improvements in the oldest residential neighborhood in Historic Downtown Castle Rock. The subdivision of Craig and Gould was originally platted in 1874 and the first house within the north area was built in 1897. This neighborhood was first paved in the 1980's with inverted crown streets for drainage and gravel shoulders for parking. Since that time, the Town has responded to several complaints from residents whose houses sit lower than the street and experience flooding during heavy rain events. The Town has addressed this over the years by adding curbing and inlets where necessary to reduce the occurrence of flooding. These solutions were temporary and the neighborhood ultimately needed an overhaul to bring it up to current standards for drainage and safety.

The objectives of the Craig and Gould North Infrastructure Improvement Project were to add storm sewer within the public right-of-way to capture stormwater runoff, replace aging water and sewer infrastructure and upgrade the streets to current residential standards for safety. This includes two travel lanes on all residential streets, parking lanes, curb, gutter and sidewalks throughout the majority of the project. Existing alleyways that remained dirt up to

this point were paved with concrete. In order to convey stormwater runoff, an outfall system was needed crossing the railroad. This outfall includes an underground water quality chamber to remove pollutants prior to discharging to East Plum Creek. The $7.6 Million project, jointly funded by the stormwater, water, wastewater and public works funds, will be completed in 2023.

Water and sewer main replacement in the Craig and Gould neighborhood.

SCADA Master Plan Projects

A SCADA Master Plan was prepared in 2008 and updated in 2016, and revised again in 2019. Improvements identified in the latest SCADA Master Plan are being implemented based on priority over a 6-year time line. The 2019 SCADA Master Plan identified $12.1 Million in improvements over course of the six years; of that budget, $10 Million was for water facilities improvements. The annual budget for minor SCADA replacements and improvements is $50,000 per year. In order to fully fund the SCADA project list for execution in a timely manner, and to minimize the impact to rates and fees, the Waterline Rehab and Replacement Account was reduced from $2 Million per year to $600,000 from 2024 through 2027 in the CIP budget.

SCADA Construction Specifications

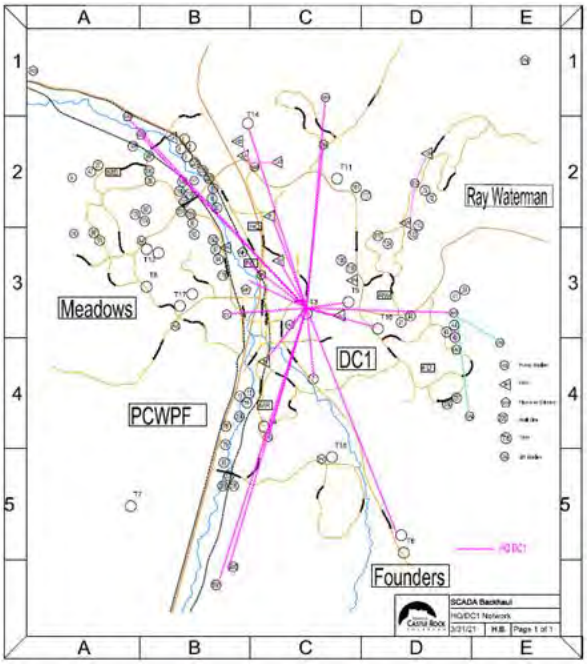
SCADA system construction specifications were developed to ensure uniformity among controls and data acquisition equipment at all facilities, particularly as new facilities are constructed or older equipment at existing facilities is replaced.

Backhaul Ring

The SCADA system is a separate and segregated system and is a stand-alone process by which many Castle Rock Water (CRW) assets are controlled remotely. CRW uses SCADA to monitor and control all processes in the water and wastewater systems for Castle Rock. CRW began the SCADA Backhaul and Radio Network Upgrade Project in August of 2021 and it was completed August 31, 2022. The project was identified as a priority in the SCADA Master Plan.

The old backhaul communication system had been in place for almost two decades and technology had evolved immensely over that period. Although some hardware components had been replaced and software upgrades had been performed over the years, a total upgrade of the

backhaul and radio network system was needed. The more robust operational system addressed deficiencies within the existing system and brought the system into compliance with modern cybersecurity and equipment safety standards. It also reduced network failure risk due to aging equipment, reduced costs of support by utilizing current, non-obsolete hardware and software, improved operator efficiency by standardizing equipment and procedures, and properly managed risk and resilience associated with process automation.



Schematic of the SCADA Backhaul Ring Network

The high speed microwave network includes 82 remote utility sites. The new backhaul bidirectional ring replaced existing T1 copper service lines and was mounted on or near six existing water tanks (using antennas), which were connected to five water treatment plants with high speed redundant communication paths. A vendor performed site path studies to ensure that all locations were able to communicate, and to allow for future growth with the addition of three remote sites. The project was completed in late 2022 at a total project cost of $1,801,157.

Water Resources CIP projects Completed

Related to our WISE partnership, renewable water goals, and also as a result of acquiring the United Water Assets in late 2017, CRW expedited several priority Water Resources Projects for completion from 2017 to 2022 to augment water supplies and also bring renewable water supplies back to the Town:

WISE Phase 1 Pipeline

Construction began in late 2016 on 5.3 miles of 36-inch pipeline to convey WISE waters from a connection with Parker Water and Sanitation District. The project was completed in 2018. After nine years of planning and more than $50 million in infrastructure, CRW began importing WISE water on schedule in April 2018.

CR-1 Diversion at PCWPF

In June 2017, Castle Rock Water completed the CR-1 Diversion Project near the Plum Creek Water Purification Facility (PCWPF), just in time for peak water demands. The diversion was designed to capture up to 3.7 million gallons of renewable water per day. The project consisted of modifying an existing 24-inch pipe, which was exposed in East Plum Creek, into a diversion structure. A portion of the 24-inch pipe was removed and replaced with a screen, to allow water to flow into the pipe. Since the pipe was an existing structure and the pipe modification did not disturb the stream, Federal permitting was not required to complete these modifications. A new pump station and pipeline was constructed to convey this water to PCWPF. Approximately 1,300 linear feet of 12-inch pipe was installed between a new pump station and the existing raw water transmission pipeline that feeds PCWPF. Additional facilities that were constructed with this project included a flow monitoring station and control facilities for operations.

If CR-1 were to operate at an average rate of one million gallons per day of production per year, the value of this water in terms of capital investment would be approximately $28 million per year (in 2017 dollars). At year-end 2017 CRW set records for renewable production, getting more than three million gallons on some days, even though the creek was running at a really low flow at the time. This project enabled us to run on more than sixty percent renewable water over the winter, allowing us to rest many of our deep wells. The contractor was T. Lowell Construction and the total project cost was approximately $773,000, including design and construction.

Plum Creek Diversion Pump Station

Castle Rock Water purchased United Water and Sanitation District's infrastructure, which included the Plum Creek Diversion near Sedalia, in November of 2017. The Plum Creek Diversion has a capacity to capture up to 25.8 million gallons per day (MGD), but at the time was only able to pump 1.15 MGD up to Castle Rock Reservoir 1. Castle Rock Water contracted with Dewberry Engineers on the design of a new pump station for the existing diversion facility. The new pump station was designed to pump up to 25.8 MGD of captured water from East Plum Creek to Castle Rock Reservoir 1. The pump station was also designed to pump up to 8 MGD from Castle Rock Reservoir 1 to the Plum Creek Water Purification Facility (PCWPF). These pumps are also designed to be expanded to pump up to 15 MGD back to PCWPF in the future. The project was completed in late 2020 within the budget of $11 Million.

Plum Creek Raw Water Return Pipeline (PCRWRP)

Through a cost-sharing intergovernmental agreement, Castle Rock Water (CRW) partnered with Dominion Water and Sanitation District (DWSD) on a joint pipeline project located between Castle Rock and the Plum Creek Diversion in Sedalia. The project team included Providence Infrastructure Consultants for the design and Reynolds Construction for construction services. The project involved the installation of two 30-inch pipelines and a master water metering facility located near Highway 85 and Atrium Drive. DWSD's pipeline will be used to wheel their WISE and other available water supplies through CRW's infrastructure, and to the Sterling Ranch Development located in northwest Douglas County. CRW's 5.87-mile-long pipeline will be used to deliver raw water from Castle Rock Reservoir No. 1 (CRR1) to the Plum Creek Water Purification Facility for treatment. Ultimately, our water reuse system will account for approximately one-third of the Town's water supply. The Town's overall cost of this project was approximately $16.3 million, including design, easement acquisition and support, project administration, and construction services. Construction began in early 2019 and was completed in late 2020, in advance of the AT processes being completed at the PCWPF.

Red Hawk Reuse Pipeline

The Red Hawk Reuse Project was identified to bring new reuse water supply to the Red Hawk Ridge Golf Course. During dry months, Castle Rock Water has supplemented the golf course's groundwater well with raw water from other deep groundwater and alluvial wells. The new source supply is the Town's treated effluent water from the Plum Creek Water Reclamation Authority (PCWRA) that has historically been discharged from PCWRA directly to Plum Creek, or sent to other golf courses. On average, over four million gallons per day of the Town's wastewater is reclaimed at the PCWRA, which can be beneficially reused for irrigation and other uses. The Red Hawk reuse system was designed to deliver more than 650,000 gallons per day to the golf course.

The Reuse Project Team developed a pipeline alignment for a new dedicated 8" reuse water-line between PCWRA and the golf course. The 3.5-mile alignment minimized land acquisition and utilized undeveloped parcels. Staff issued a request for proposals and Global Under-ground was selected as the contractor to construct the project utilizing minimal design documents to accelerate the project schedule.

Global began constructing the pipeline in May while staff finalized construction agreements with landowners along the alignment. Six horizontal directional drilled crossings under roads and creeks were required, as well as an auger bore under the railroad. The pipeline was substantially completed in October in advance of completion of the new reuse pump station. The first reuse water was delivered to Red Hawk Golf Course in November 2019. Nearly one mile of the total 3.5 miles was constructed utilizing trenchless construction. Staff is now working on a follow-up pipeline project to repurpose the golf course deep groundwater well as additional municipal raw water supply for the Meadows Water Treatment Plant. The new pipeline will help the Town maximize reuse water rights, reduce demands on the municipal water system, supply sustainable irrigation water for the golf course and additional nutrients for the turf, reduce irrigation pumping costs, and increase community familiarity with reuse. Cost of the project was $1.8 million (under budget).

Red Hawk Reuse Pump Station

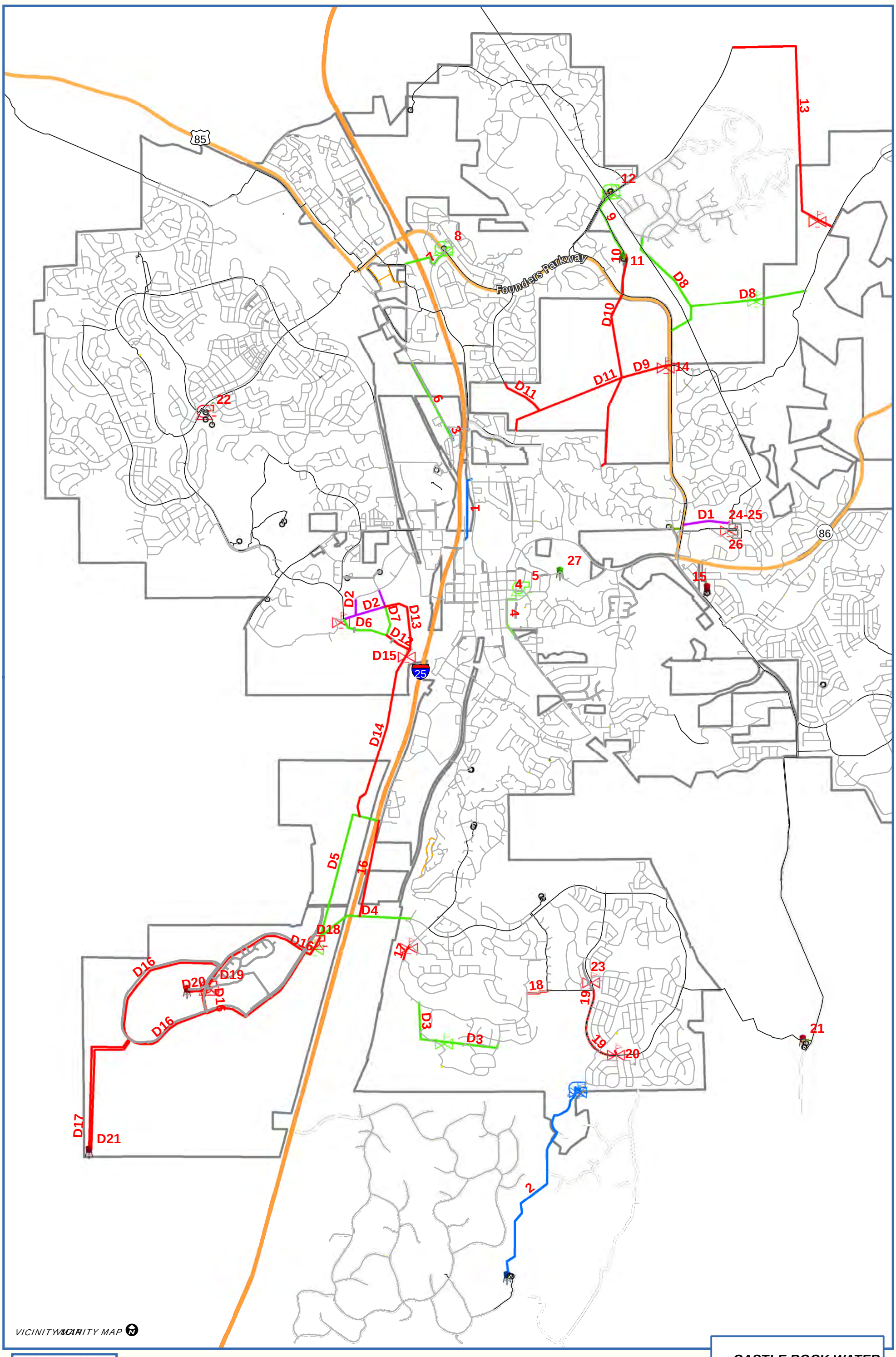
As part of the overall Red Hawk Reuse Project, a new dedicated pump station was needed to send treated reuse water through 3.5 miles of new pipeline from the Plum Creek Water Reclamation Authority (PCWRA) to the Red Hawk Ridge Golf Course. Castle Rock Water has been actively involved in the PCWRA Capacity Expansion Project, which began construction in the fall of 2018. Burns & McDonnell Engineering and Moltz Construction provided design and construction management services for the plant expansion. With both entities already onsite at PCWRA in 2019, the Town contracted with Burns & McDonnell and Moltz to design and construct a dedicated Red Hawk Reuse Pump Station at PCWRA. With PCWRA and Town input, a design was developed to retrofit the existing reuse pump station at PCWRA with a new Red Hawk Reuse pump, motor, piping and appurtenances, and electrical and controls equipment. The project also required installation of approximately 800 feet of reuse pipeline across the PCWRA treatment plant property.

CRW SCADA and Plant Mechanics teams installed new telemetry and pond level monitoring equipment at the golf course pond and at PCWRA and worked out details for communication signals between the CRW and PCWRA's systems. The reuse system was ready for fully automated use when the golf course begins irrigating in early spring of 2020, and it is capable of exceeding the golf course's peak day demand of 650,000 gallons per day.
Project cost: Approximately $671,000 (under budget)

Future Projects

Following are all water infrastructure capital improvements, listed by planning horizons, identified in this updated master planning effort, including a brief discussion of scope. There are three planning horizons based on model year 2022: current five year that includes 2023-27; ten year (2028 through 2033); and build-out conditions beyond 2034. Table 4-1 shows the capital plan, by planning period, through build out. The location of each project is shown on Figure 4.1. The table and figure also shows anticipated future infrastructure to be constructed by new development (Developer CIP) with a "D" prefix. The projects in the five year plan are shown in "blue"; projects in the ten year plan are shown in "green"; projects in the buildout planning period, beyond 2034, are shown in "red".

Table 4.1 CIP Project List				
Phase	Project	Project Type	Project Name	Description
5	1	Pipe	Front St Downtown Connection	2600 feet of 12" transmission main to connect Front Street to Wilcox
5	2	Pump	Bell Mountain Infrastructure	Bell Mountain PS, Tank, and Transmission Main
5	3	Pipe	Liggett Road Upsize	Liggett Road bottleneck 600 feet of 16"
5	24	Pump	RWRWTC Red Zone Pump Upgrades	RW Red Zone Pumping Upgrades 4500 gpm
5	D1	Pipe	Echelon Distribution	Red zone connection and distribution pipes (underway)
5	D2	Pipe	Millers Landing Infrastructure	Red zone connection to 16" in PC Parkway, distribution pipes, PRVs
10	4	Pipe	Hillside Improvements	Hillside PS Transmission main 2100 feet of 12"
10	5	Pump	Hillside Pump Station Upgrades	Hillside PS 2600 gpm @ 450 feet
10	6	Pipe	Liggett Road Transmission	Liggett Road transmission 3500 feet of 16"
10	7	Pipe	Front St. Improvements	Castleton to Front 1300 feet of 16" and 1100 feet of 20" under I25
10	8	Pump	Milestone PS Upgrades	Milestone PS upgrade 4000 gpm
10	9	Pipe	Tank 11B Transmission	Tank 11B transmission main 2300 feet of 20"
10	10	Pipe	Crowfoot Purple Zone Upsize	Crowfoot Valley purple zone 200 feet of 16"
10	11	Tank	Tank 11B	second purple zone Tank 11 (Tank 11B)
10	12	Pump	Diamond Ridge Pump Station Upgrades	Diamond Ridge red zone 2800 gpm
10	D3	Pipe	Lanterns Pipelines	Lanterns distribution
10	D4	Pipe	Dawson Trails Infrastructure	Dawson Trail 16-inch transmission main
10	D5	Pipe	Dawson Trails Infrastructure	Dawson Trail 12-inch transmission main
10	D6	Pipe	Millers Landing Infrastructure	Millers Landing 16-inch transmission main extension
10	D7	Pipe	Millers Landing Infrastructure	Millers Landing distribution
10	D8	Pipe	Canyons Far South Infrastructure	Canyon Far South distribution
10	27	Tank	Tank 3B	new Tank 3B to replace oldest tank
BO	13	Pipe	Canyons South Infrastructure	Canyons South to Cobblestone loop 10,500 feet of 16"
BO	14	Valve	Pioneer Ranch FCV	Pioneer Ranch automated flow control valve
BO	15	Tank	Tank 16B	second red zone tank, Tank 16B
BO	16	Pipe	Frontage Road Transmission	I25 Frontage Road Loop 4000 feet of 12 inch
BO	17	Pipe	Plum Creek Transmission	Plum Creek Transmission 700 feet of 12" and PRV
BO	18	Pipe	Lanterns Inwood Place Upsize	Inwood Place upsize 1000 feet of 16 inch
BO	19	Pipe	CVR Loop Road Transmission Upsize	Loop Road upsize 3500 feet of 24"
BO	20	WTP	CVR Water Treatment Plant	Crystal Valley WTP
BO	21	Tank	Replacement Tank 6B	new Tank 6B
BO	22	Pump	Blue Zone Pump Station Upgrades	Blue Zone PS second high service pump
BO	23	Valve	West Loop Road PRV Upgrades	W. Loop Road PRV Upsize
BO	25	Pump	RWRWTC Red Zone Pump Upgrades	RW Red Zone Pumping Upgrades 6330 gpm
BO	26	Pump	RWRWTC Green Zone Pump Upgrades	RW Green Zone Pumping Upgrades 4200 gpm
BO	D10	Pipe	Pioneer Ranch Infrastructure	Pioneer Ranch T11 transmission 20 inch
BO	D11	Pipe	Pioneer Ranch Infrastructure	Pioneer Ranch Distribution
BO	D12	Pipe	Millers Landing Infrastructure	Millers Landing 16 inch transmission extension
BO	D13	Pipe	Millers Landing Infrastructure	Millers Landing distribution
BO	D14	Pipe	Dawson Trails Infrastructure	Dawson Trails Meadows connection 16" main
BO	D15	Valve	Dawson Trails Infrastructure	Dawson Trails Meadows connection PRV
BO	D16	Pipe	Dawson Trails Infrastructure	Dawson Trails distribution
BO	D17	Pipe	Dawson Trails Infrastructure	Dawson Trails Tank 21 fill and supplies transmission mains
BO	D18	Pump	Dawson Trails Infrastructure	Dawson Trails Red Zone Pump Station
BO	D19	Pump	Dawson Trails Infrastructure	Dawson Trails Green Zone Pump Station
BO	D20	Tank	Dawson Trails Infrastructure	Dawson Trails Tank 19 and transmission main
BO	D21	Tank	Dawson Trails Infrastructure	Dawson Trails Tank 21
BO	D9	Pipe	Pioneer Ranch Infrastructure	Pioneer Ranch transmission 20 inch


85
Founders Parkway
25
86
1
2
3
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VICINITY MAP
0
1,750
3,500
7,000
10,500
Feet
1 inch = 3,500 feet
CASTLE ROCK water
Securing our future drop by drop
Disclaimer: The data presented has been compiled from various sources, each of which introduces varying degrees of inaccuracies or inconsistencies. Such discrepancies in data are inherent and in supplying this product the Town of Castle Rock assumes no liability for it's use or accuracy. Questions or comments regarding the cartographic composition of this map including, but not limited to, errors, omissions, corrections, and/or updates, should be directed to the Utilities Department, Town of Castle Rock, (720) 733-6056. Copyright 2022, Town of Castle Rock Utilities Mapping.
CASTLE ROCK WATER
CIP PROJECT MAP
FIGURE 4.1
Date: 4/10/2023 Document Path: J:\B. PLAN & ENG\13.0 Engineering\13.8. Planning\Master Plans\2022 Master plan update\\

2023-2027 Planning Horizon (Five Year Plan)

Waterline Rehab and Replacement

W. Prestwick Way Waterline

The W. Prestwick Water Line Rehab Project is located west of Plum Creek Blvd., near the intersection of Plum Creek Blvd. and Mt. Royal Dr. This project will replace the aging potable water distribution piping in W. Prestwick Way. The water main in W. Prestwick Way has had a significant number of main breaks in recent years. The water main was constructed in the early 1980s with ductile iron pipe. The existing pipe does not appear to have been wrapped in plastic when it was installed. The breaks that have occurred appear to have been caused by corrosion. Construction will begin in 2023. Total construction cost is expected to be approximately $1,204,648.

Young American

The area has been identified for future pipeline replacement in the Waterline Rehab Plan (draft 2022). Design for replacement will begin in 2023 with construction planned in 2024. The project may be phased due to size of the area and budget constraints.

Supply

East Plum Creek Open Space ASR Wells

This project will include the drilling, completion, and pump testing of one Arapahoe Aquifer well, one Denver Aquifer well and one Dawson Aquifer well. Staff anticipates that the Arapahoe Aquifer well will produce 250 to 300 gallons per minute (gpm), the Denver Aquifer well will produce 200 to 250 gpm, and the Dawson Aquifer well will produce 50 to 80 gpm or approximately a total of 0.72 to 0.90 million gallons per day (Mgd). This facility has been designed with the flexibility to produce water that can be sent to the PCWPF or the Meadows Water Treatment Plant (MWTP). This will give the operations team the ability to send water to the MWTP in the summer to maximize water production or to PCWPF for blending in the winter. Additionally, this facility is design for ASR to bank renewable water during the off peak season. Construction will begin in 2023. Total construction cost is expected to be approximately $2,613,215.01

Bell Mountain Infrastructure

The Ridge Estates development in lower CVR needed water storage in a zone higher than existing pressure zones within the CRW service area and needed storage within the Bell Mountain service area. BMR was also short on fire flow storage for its 321 residences within their service area. The developer, BMR and the Town are jointly constructing an additional 0.40 MG storage tank within BMR, and also a pump station and potable water interconnect between CVR and BMR. This interconnect and pump station will allow CRW to provide service to BMR in the future to either make improvements at the BMR WTP for continued service or to decommission the plant altogether if a CVR WTP is constructed. Also, a new raw waterline from one of the existing Bell Mountain Wells will be extended to the existing Bell Mountain Ranch WTP in summer 2023.

Treatment

PCWPF Expansion, Phase 1

Current plans for full expansion of PCWPF will follow a three phases schedule of construction to reach ultimate treatment, pumping and distribution capacity of 12 MGD by 2031. Phase 1 will increase the treatment and distribution capacity to 8 MGD by early 2026. Included in Phase 1 is the replacement of 12,500 linear feet of existing 16-inch potable pipeline with new 30-inch pipe, to include a 1,500 linear feet horizontal directional bore under Plum Creek to minimize impacts to endangered Prebles Mouse Habitat. Phase 2 will increase treatment and pumping capacity to 10 MGD, for completion in 2028. Phase 1 design should occur in 2023, with a two-year construction phase in 2024-2025, with processes online to meet demand in 2026.

Distribution and Transmission Lines

Future transmission lines may be required to efficiently move water supplies around Town. Developers install the transmission and distribution lines required to serve their development. The Town can require that distribution lines be installed at up to 12" by the developer, and can request that the lines be "upsized" beyond 12", with the additional upsize costs incurred by the Town. Future in-fill annexations in the Pine Canyon, Pioneer Ranch, Macanta, and Dawson Trails could require additional or upsized transmission lines. Depending on the timing of developer projects, future demands, and availability of out of service area water supplies, it could be necessary for the Town to build infrastructure, with potential recoupment from future benefited development.

Liggett Road Upsize

A short section, 600 LF, of the existing distribution main in Liggett Road must be upsized to 16 inches to accommodate increased flows from the PCWPF. The estimated project cost is $373,000.

Front Street Downtown Connection

2600 LF of 12" transmission main to connect Front Street to Wilcox Street, to support downtown development. The estimated project cost is $1,063,000.

Echelon Distribution (Developer)

Red zone connection to transmission main in Founders Parkway and internal distribution pipes. Project is underway in 2022.

Millers Landing Infrastructure (Developer)

Red zone connection and looping pipes in Plum Creek Parkway, internal distribution, and PRVs as required to support the development; this is anticipated in the 5-year timeline of 2023-2027.

Pumping

RWRWTC Red Zone Pump Upgrades

Pumping improvements are needed as the WISE water becomes more available. The red zone and green zone pumps at the Ray Waterman Regional Water Treatment Center (RWRWTC) will undergo several phases of upgrades to keep up with increasing supplies of

water to the plant. Phase 1 Red Zone Upgrades were completed in 2020 when the red zone pumps needed to be rehabilitated.

2028– 2033 (Ten Year) Planning Horizon

RWRWTC High Service Pump Station

Supply

Crystal Valley Ranch Wells

Over 5 MGD of new deep well water supply is planned at dedicated well sites in the Crystal Valley Ranch area. The estimated project cost is $19.5 Million.

Treatment

Media Replacement

Water treatment media replacement is being budgeted to replace media every five years, alternating among the treatment facilities.

Membrane Rack Replacement

Membrane filtration racks at the PCWPF are scheduled for replacement of one rack every year.

Granular Activated Carbon (GAC)

The GAC media filtration tanks at PCWPF had the carbon media fully replaced in early 2023:

PCWPF Expansion to 12 MGD

Current plans for full expansion of PCWPF will follow a three phase schedule of construction to reach ultimate treatment, pumping and distribution capacity of 12 MGD by 2031. The final two phases to reach 12 MGD of treatment and pumping are planned to be completed by early 2031. Current estimated opinion of costs (in 2022 dollars) for the three-phased expansion to 12 MGD is about $58.8 Million.

New CVR WTP 8 MGD

An alternatives study completed in Feb 2023 recommended construction of a new 8.0 MGD WTP in the CVR area over a new facility in BMR; $50 Million has been included in the CIP planning budget for design and construction of this new WTP, beginning in about 2028 with design.

Storage

Tank 11B

A new purple zone tank will be required to support future development in currently unincorporated areas of Castle Rock being planned as Pioneer Ranch and Pine Canyon. The Tank will be 2.3 Mgal in capacity; estimated cost $6,600,000.

Tank 3 Replacement

Tank 3, built in 1969, is currently the Town's oldest storage tank. In 2015 the upper deck was repaired, which probably gained another 15 to 20 years of usable life, however, future replacement is warranted. Estimated cost to replace the 1.0 MGD tank is $2,200,000.

Tank 3 Roof Deck, Pre and Post Rehab

Pumping

Hillside Pump Station Upgrades

The Hillside pump station will need to be upsized from current pumping capacity of 800 gpm to 2,600 gpm at a head of 450 feet.

Milestone Pump Station Upgrades

The existing Milestone Pump Station will need pumps upsized from 3,000 gpm to 4,000 gpm to move future treated water from the PCWPF.

Diamond Ridge Pump Station Upgrades

The red zone pumps at the existing Diamond Ridge Pump Station will need to be upsized from 1,440 gpm to a 2,800 gpm flow rate.

Distribution and Transmission

Hillside Improvements

Concurrent with pump station upgrades, a new transmission main, 2,100 lf of 12-inch pipeline, will need to be constructed.

Front St. Improvements

Transmission pipes from Front St. to Castleton will need to be upsized; 1,300 lf of 16-inch pipe and 1,100 lf of 20-inch pipe (under I-25) will need to be constructed.

Crowfoot Purple Zone Upsize

225 linear feet of 20-inch pipeline to upsize existing purple zone transmission in Crowfoot Valley Road. Required to move additional water supplies. The project timing may also depend on public street improvements. The estimated project cost is $390,000.

Liggett Road Transmission

Almost 3,500 lf of 20-inch transmission main will need to be constructed in Liggett Road to convey future PCWPF flows.

Tank 11B Transmission Main

2,300 lf of 20" transmission main will need to be constructed to support the future Tank 11B.

Lanterns Pipelines (Developer)

Additional distribution and transmission pipes are installed as the neighborhood grows towards buildout.

Dawson Trails Infrastructure (Developer)

Internal distribution pipes and larger 12-inch and 16-inch transmission mains will need to be installed as the neighborhood develops.

Millers Landing Infrastructure (Developer)

Various extensions of existing 16-inch mains, connections to existing mains, and internal distribution pipes will be installed as the development proceeds.

Canyons Far South Infrastructure (Developer)

Connections to existing mains and future distribution pipes to support the development will need to be constructed.

2034– Buildout Planning Horizon

Storage

Tank 16B

A new red zone tank will be on Ridge Road next to the existing Tank 16. This tank is needed to facilitate the pumping of imported renewable water. The volume of the tank will be 2.0 MG and the tank will cost approximately $5,500,000.

Tank 6B Replacement
The existing Tank 6B will be demolished and a new 2.2 Mgal storage tank built on the existing site. Estimated cost is $4,400,000.

Dawsons Trails Infrastructure (Developer)
Future Tank 19 (Red Zone Tank) and transmission mains, and future Tank 21 (Green Zone Tank) to provide storage and fire flow for the development.

Pumping
RWRWTC Red Zone and Green Zone Pumping Upgrades
Future pumping improvements will be needed as the WISE water becomes more available. The red zone and green zone pumps at the Ray Waterman Regional Water Treatment Center (RWRWTC) will undergo several phases of upgrades to keep up with future increasing supplies of water to the plant. Phase 2 Green Zone Upgrades and Phase 3 Red Zone Upgrades are planned in this timeframe. Estimated Costs: $2.5 Million.

Blue Zone Pump Station Upgrades
The second high service pump at the Blue Zone Pump Station will need to replaced/upsized.

Dawson Trails Infrastructure (Developer)
The Red Zone and Green Zone pump stations to supply water to the Red and Green Zone tanks will have to be constructed.

Treatment
Crystal Valley Ranch Water Treatment Plant
A new 8 Mgd water treatment plant, with associated new wells and raw water supply lines. Project may be built in phases.

Distribution and Transmission
Canyons South Infrastructure
Over 10,500 lf of 16-inch transmission main linking Canyons South to the Cobblestone loop will need to be constructed.

Dawson Trails Infrastructure (Developer)
Future Dawson Trails to Meadows 16-inch transmission main, connection to existing, and PRV. Internal distribution pipelines, and fill/supply mains to/from the future Tank 21.

Pioneer Ranch Infrastructure (Developer) - Future infill annexation of the Pine Canyon and Pioneer Ranch will require a transmission line from the Tank 11 purple zone tank. The developer must install a pipeline to serve the Pine Canyon development and initial planning documents indicate the size will be 16 to 20 inches. Also, internal distribution piping of various sizes will have to be installed to support the development.

Pioneer Ranch Flow Control Valve
A flow control valve from the Pioneer Ranch development to the existing transmission mains in Founders Parkway will need to be installed.

Crystal Valley Ranch Loop Road Transmission Upsize
3,500 linear feet of 16-inch transmission main upsized to 24-inch to move future supplies.

West Loop Road PRV Upgrades
Existing PRV is upsized to meet future transmission demands.

Frontage Road Transmission
Transmission main to loop blue zone in I-25 Frontage Rd. The project consists of approximately 4,000 feet of 12-inch pipe.

Plum Creek Transmission
Installation of about 700 lf of 12-inch pipe and a new PRV.

Lanterns Inwood Place Upsize
Upsize of approximately 1,000 lf of existing pipelines to 16-inch.

Millers Landing Infrastructure (Developer)
Future 16-inch transmission main extension along Plum Creek Parkway; construction of distribution looping mains within the development.

5. Recurring Capital Improvement Projects

In addition to identified capital improvement projects, there are several programs budgeted annually to cover routine or as-needed projects, generally due to the aging or obsolescence of equipment and assets:

Waterline Rehab and Replacement

Older water mains within the distribution system require replacement after their useful life, which generally is fifty years. Castle Rock Water identifies critical lines based on a history of water main breaks, age, pipe material and condition score, and tries to time replacement projects in advance of, or in coordination with, the Public Works Pavement Maintenance Program. For the long-term viability of the distribution network, $600,000 per year is currently budgeted starting in 2024 but increases to $2,000,000 per year budgeted beginning in 2028. Castle Rock Water anticipates that in the near future, waterline rehabilitation and replacement may require a larger annual financial dedication to ensure that system reliability, as measured by the KPI (number of leaks plus breaks per 100 miles of piping) of water distribution system integrity, defined as the total number of leaks/breaks per total miles of distribution system piping, remains in the top quartile. Castle Rock Water scored a KPI of 7.2 in this category for 2022. A low score is desirable, and to be in the top quartile the score must be 11.1 or less. A 10-year plan for rehab and replacement of waterlines has been developed that focuses on pre-1980 distribution pipe. Refer to Figure 5.1.

Water Treatment Plant Upgrades and Equipment Replacement

The Town relies on six (five main, one peaking) water treatment facilities to treat water and the equipment in each plant has a limited life. This project fund is for smaller capital equipment replacement and general facility upgrades at these facilities. The budgeted cost is $150,000 per year.

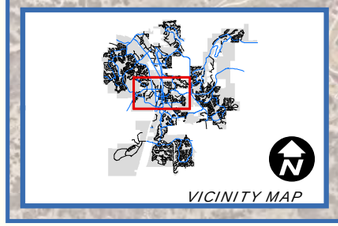
Water Supply Wells:

- Well Redrills

  Castle Rock Water, recognizing the importance of the deep groundwater wells to the Town's water supply portfolio for the long-term, budgets $2,000,000 every two years for the re-drill of a deep well, and budgets $1,000,000 yearly for other well maintenance and equipment

Legend

- Tank 3 Water
- DC High School
- Bishop Ct Water
- Wilcox St Water
- Young Am Water Ph2
- Castle Rock Heights Water
- Rock St Water
- Fifth St Water
- Kinner St Local Water
- Fair St Water
- South St Water Ph3
- South St Water Ph2
- South St Water Ph1
- Young American Water



Legend

- Sanitary Sewer
- Stormwater Conduit
- Fiber
- Raw Water Distribution Main
- Water Distribution Main

CASTLE ROCK Qwater
Securing our future drop by drop

0 500 1,000 2,000 3,000 Feet

1 inch = 1,000 feet

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CASTLE ROCK WATER
WATER REHAB MAP
FIGURE 5.1

Date: 9/6/2022

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replacement. The Town currently operates 52 deep groundwater wells that pump from three Denver Basin aquifers: Dawson, Denver, and Arapahoe. The typical life expectancy of a municipal well is approximately 25 years. In order to maintain adequate groundwater supply, older damaged or unproductive wells have to be replaced. A capital replacement plan has been developed whereby unusable wells are replaced by drilling new wells at the same location. The program is funded so that one deep well can be replaced every other year at a cost of approximately $2,000,000 to cover the drilling, new pumping equipment, and costs for retrofitting well controls.

Rig set up over existing well to pull down-hole equipment.

- Well Equipment Replacement

Down-hole pumps and motors in wells will periodically experience mechanical or electrical failures due to wear and tear of the equipment. The typical life expectancy of well pumping equipment is approximately seven years, depending on factors such as the amount of runtime and well conditions. Pumping equipment is rebuilt or replaced in wells depending on the type of failure. In addition, as failures occur, there is a program in place to evaluate the condition of the well casing and screens, and determine if the well efficiency and production rate will benefit from a rehabilitation effort. To do the evaluation the down-hole equipment and column pipe must be pulled from the well and a video survey conducted. The survey allows the condition of the casing and screens to be inspected for buildup and scaling. Depending on the well condition, a rehabilitation program is designed that is tailored for the individual well. Rehabilitation can consist of mechanical methods such as wire brushing with a wire line tool, or by chemical means such as introducing a mild acid into the well. A third method called Sonar-Jetting uses sonic waves to strip scale, and to agitate and rearrange the gravel pack in the well annulus. All three of these rehabilitation methods can be used individually or combined, depending on the severity of the well screen plugging. Declining well performance can be improved with rehabilitation, and the life of the well structure extended with proper operation and maintenance. The annual budget for the Well Equipment Rehabilitation and Replacement program is approximately $1,000,000.

VFD Replacement

Each of Castle Rock Water's treatment plants and pump stations have many pumps, and often these pumps have associated variable frequency drives (VFDs), which have a finite life like many components. $125,000 is budgeted each year for replacement of VFDs, as needed or as planned.

Pump Station Equipment Replacement
Electrical and mechanical equipment needs to be replaced as equipment reaches the end of its useful life. A preventive maintenance program associated with asset management will be used to determine replacement schedules based on the type of equipment, service duty and operating conditions. $50,000 is budgeted yearly.

Tank Rehabilitation
Rehabilitation and improvements to existing water storage tanks are identified in conjunction with the tank cleaning and inspection program. Expenditures of $50,000 per year are budgeted for capital improvements to the existing water storage tanks.

Distribution System Upgrades
Upgrades to the distribution system include the automation of key PRVs to help with the efficient flow of water through the distribution network, and minor piping projects to help with connectivity and distribution of water within and between pressure zones. Other improvements include rehabilitation projects to improve reliability and decrease ongoing maintenance, such as the addition of and rehabilitation of valves and fire hydrants to older neighborhoods. The annual budget for this work is $250,000.

Typical PRV

General Facility Upgrades
Upgrade projects are small projects that improve the functionality and/or appearance of Town water facilities. Projects include roofing replacement, exterior repairs, drainage, landscaping, and site improvements at existing facilities. Also included are minor improvements associated with mechanical and electrical systems. The annual budget for upgrades is $75,000. These are typically smaller projects identified during routine maintenance.

Security and SCADA Improvements
$25,000 is budgeted yearly for security improvements (alarms, fences, cameras, etc.), and $50,000 yearly for SCADA improvements at the various water facilities. This is currently budgeted separately from the overall funding for the SCADA master plan projects.

6. Operations and Maintenance

Key Performance Indicators

By participating in the AWWA Utility Benchmarking program, Castle Rock Water tracks many metrics in order to benchmark the utility against other utilities nationwide, in support of Castle Rock Water's efforts to be a national leader.

Manpower and Staffing

Castle Rock Water's Operations Division is responsible for day-to-day operation and maintenance of 67 well facilities, six treatment plants, 16 water storage tanks, 20 finished water pump stations, and 507 miles of raw, transmission and distribution piping and appurtenances that serve more than 26,400 water service accounts at the end of 2022. There are seventeen licensed water treatment operators that run six water treatment plants. CRW employees began operating the newly acquired Bell Mountain WTP in early 2023. The Plant Maintenance Division of Castle Rock Water has one supervisor, five plant mechanics, one preventative maintenance technician, and one grounds and facilities technician dedicated to facilities maintenance. Plant mechanics are responsible for most preventive maintenance and repair of electrical/mechanical equipment at the wells, treatment plants, pump stations, and other wastewater facilities. The water fund also shares support of seven employees in the Engineering/GIS Division, which includes four professional engineers. Engineering provides support to operations and manages capital programs and projects. GIS provides mapping and asset management support. Three SCADA personnel (with a fourth to be added in 2023) keep systems up-to-date and operational. Customer Relations, Billing, Meters, and Administration personnel are also partially funded from the water fund. Many of the distribution staff hold system operator certifications. All of the water treatment operators are licensed operators.

Training /Professional Development

Water staff averaged over 17 hours of training (safety, technical and professional development) per employee in 2021. This compares to 17.7 hours per employee for those utilities in the top quartile that are participating in the AWWA Benchmark program.

Equipment

Wheeled Excavator

In 2021, Operations purchased a wheeled excavator and attachments at a cost of $350,000. Field staff presented the business case that over the years Castle Rock Water has installed and/or purchased several miles of large diameter (>16'') pipeline (WISE pipeline, Sedalia pump station raw water return pipeline, the PCWPF alluvial well line, Mitchell Creek Force main). These pipelines are mostly PVC, or in the case of the Ravenna pipeline, Fiberglass (FRP), and have areas of deep bury depths. There have been multiple breaks on these lines over the years. These repairs have either been repaired in house or have been contracted out. Prior to the excavator purchase, the repairs that we were able to perform in-house had to be located in very accessible and open areas; allowing for 360-degree access around the break. In most cases, our best option was to utilize an emergency contractor to complete the repair. While contractors have been available and able to complete the repairs in a timely

manner, the cost is significantly higher than repairs completed in house, typically 2-4 times the cost of doing the repair in house.
Before the excavator was purchased, any repair task that exceeded 12' in depth generally required contractor support due to the limited excavation depth of the backhoe generally used. With the purchase of this excavator dig depth increased to 20'. The excavator's lifting capabilities broadened the scope of work performed by Field Services. Including utilizing larger trench boxes on excavations, lifting barricade blocks and street plates during repairs, setting large manholes and vaults, etc. The extended reach of the excavator also provided benefits in safety and efficiency. The further reach allowed for safer removal of compromised pavement around sink holes. It also allowed for equipment to be placed further away from excavations, reducing the risk of trench collapse or equipment being driven into the excavation. The excavator's dig bucket is significantly larger than the bucket used with our back hoe or mini-excavator. This is important when removing sediment from storm ponds. Renting an excavator for stormwater maintenance came at a cost of $3,500 per week. Having our own excavator translated to increased opportunity and less rental cost for stormwater maintenance. The main advantage of the wheeled excavator is that it can be driven to job sites, eliminating the need for truck and trailer transport, which reduces vehicle maintenance needs.

All-Terrain Vehicle (ATV)
Operations staff purchased a four seat, side by side, all-terrain vehicle (ATV) in 2020 at a cost of $23,000. With the acquisition of the Plum Creek Diversion and the pipeline to Ravenna, and the installation of the Plum Creek Raw Water Return Pipeline and the Red Hawk reuse line, CRW gained many new assets including: valves, manholes, air relief valves, low point blow offs, service connections and locate wire test stations. All of these assets require routine maintenance and inspections, as well as emergency responses. The majority of these line runs through rough terrain which includes multiple creek crossings and steep grades. Negotiating this terrain is very difficult if not impossible for standard work trucks. Another major concern was that the majority of the terrain is also covered in tall native grasses. During dry months, fires can ignite when the dried grass comes into contact with the catalytic converter on a work truck. The ATV is equipped with undercarriage skid plates and spark arrestors, minimizing the wildfire hazard. The safest and most effective way too many of the easement is by ATV. While the side by side primarily resides in field services, it is used by locates, GIS, and SCADA staff to assist in performing job responsibilities along the pipelines and other infrastructure that is located in remote areas.

Tandem axle dump truck
Operations is proposing the purchase of a tandem axle dump truck in 2023 at a cost of $240,000. The Field Services Water Distribution team is responsible for providing routine maintenance and repair services to all of Castle Rock Water's distribution and transmission systems. The Distribution team also provides seven days per week 24 hours per day emergency response to all of Caste Rock Water's customers. The response area now includes the Bell Mountain Ranch and, in the future, the Dawson's Trails subdivisions. These two new developments, along with the Plum Creek Diversion, Crystal Valley Ranch, Montaine and Cobblestone Ranch are located in outlying areas of the town proper. With the growth of the Town's infrastructure, it is now necessary to haul excavation equipment with a flatbed

trailer utilizing the towing capacity of a tandem axle dump truck. The addition of a tandem axle dump truck will greatly improve response times within town, as well as to the outlying areas within CR Water service areas. Trailering heavy equipment, rather than driving it to locations within the Town, creates a much safer environment for citizens and the Operators. The Distribution fleet's current single axle dump truck is undersized and cannot pull the required heavy equipment. A tandem axle dump truck can haul nearly the same amount of backfill and spoils material as two single axle trucks. This results in a more efficient operation, reducing overall project costs.

Vactor Truck

There are multiple maintenance tasks throughout all of Castle Rock Water's (CRW's) assets that can only be safely completed by utilizing a high pressure jetting operation (Jet), a high volume vacuum (Vac), or a combination of both. These tasks include: primary task of collection system cleaning and maintenance; ancillary tasks that include: Stormwater infrastructure cleaning and maintenance; distribution system maintenance such as cleaning valve boxes; hydro excavation; cleaning water tanks; cleaning equalization basins and wet wells; cleaning treatment plant clear wells; and alluvial well rehabilitation. The Vac truck is also used in emergency response to sanitary sewer overflows, waterline breaks and other unplanned assignments. All of these activities are currently achieved through the use of CRW's combination vac truck. Currently the various operations groups within CRW must share this vital piece of equipment and schedule labor and work tasks appropriately, which takes schedule time from the primary task of collection system cleaning and maintenance. On top of all of these tasks, the Vac truck is a very complex piece of machinery that requires routine maintenance and repairs, which result in the Vac truck out of service roughly eight days annually. When the sole Vac truck was out of service, it was not available for emergency response.

A business case analysis determined that the addition of the proposed second Vac truck to CRW's Fleet would allow for the new Vac truck to be used by other teams without impacting the sewer line cleaning program, would provide redundancy for emergency response, and increase maintenance productivity among water, wastewater and stormwater operations. The second vac truck was purchased in 2018 at a cost of $450,000. The two vac trucks are scheduled for replacement in 2024 and 2033.

Asset Management

GIS and asset management play an important role at Castle Rock Water (CRW) by supporting day-to-day operations, as well as providing data analysis and metrics. While GIS has been used by CRW for over fifteen years, a Computerized Maintenance Management System (CMMS) was implemented in 2014 and is still very much in development. Cartegraph's Operations Management Software (OMS), an asset management specific software used to track asset condition, cost and work history, was selected as the CMMS for CRW.

The goal of GIS and AMP is to help CRW make data driven decisions and track maintenance. CRW created the asset management program to allow the department to operate more effectively and efficiently to meet the growing demands associated with a rapidly growing customer base. To help guide the Town's investment, CRW has incorporated information management and GIS to become more proactive in terms of planning, operations, and asset

maintenance management. Maintaining accurate and up-to-date infrastructure data is a major priority, along with implementing technologies that provide a significant return on investment in cost, business functions and improved customer level-of-service.

Operations and Maintenance Policy and Programs

Several policies and programs drive the Operations and Maintenance costs. Foremost, levels of service drive day-to-day operations.

Hydrant Inspection

Fire hydrants are placed within the distribution to ensure the availability of water for firefighting capabilities. These hydrants are exposed to damage by traffic, vandalism and the elements and the American Water Works Association (AWWA) recommends that hydrants should be inspected at least annually. Hydrant maintenance includes inspecting all external parts for damage, operating the hydrant and measuring the flow, lubricating all moving internal parts and painting the exterior when necessary. The Town currently has over 4,720 potable water hydrants in the distribution system, which are inspected annually. To accomplish this program at its current level requires two Field Services staff. In 2022, hydrant inspection and flushing involved 4,177 tasks, 1017 labor hours, and a labor cost of $51,604. Hydrant maintenance and repair accounted for 166 tasks, 462 labor hours and a labor cost of $25,145.

Flushing

To maintain the water quality of the distribution system, the system must be flushed periodically. Dead-end mains pose a significant threat to water quality, and are generally the priority with water flushing. These dead-end mains are flushed as needed to move sediment and stale water out. Ideally, any portion of the distribution that does not enjoy significant turn-over would be flushed annually as well. Currently, flushing is performed in conjunction with the hydrant inspection program. Operations staff invests approximately 700 hours each year on the flushing program at a cost of $43,000 per year.

Valve Inspection

Valves are placed in the distribution system to isolate small sections of the distribution system for maintenance or emergency repair with minimal disruption of service to surrounding residents and businesses. These valves must be inspected and exercised routinely to ensure they are accessible and operational. Additionally, it is imperative that these valves are in the proper position to ensure water quality is not compromised and that adequate fire flow is available in an

emergency. Currently, valves are inspected and exercised every two years by the Field Services section. The Town currently has approximately over 14,800 system valves in the water system. AWWA standards recommend that valves be inspected and exercised bi-annually. To accomplish this program at its current level requires two Field Services staff investing approximately 3,618 tasks, 1,038 labor hours and a labor cost of $47,272 in 2022.

Leak Detection

AWWA estimates that the average water system leaks three gallons per minute per mile of pipe. With approximately 510 miles of active buried water lines (raw, reuse and potable) in Castle Rock, hypothetically speaking, the Town's water system could be leaking 804 million gallons annually. Fortunately, this is not the case for Castle Rock Water, based on water accounting and an active leak detection program in place. Castle Rock budgets $25,000 annually for leak detection services by a third party. The Field Services group has a goal of leak surveying one-third of the distribution system annually by a combination of contract services and data logging. CRW tracks its Infrastructure Leakage Index (ILI), a measure of leaks per mile of transmission and distribution pipe. For 2022, CRW's ILI was 0.8, putting the utility in the top ten percentile of all utilities reporting as part of the AWWA Utility Benchmarking Program. This favorable index reflects the return on investment of the Leak Detection Program, and a commitment to rehab and replacement of aging pipe, but is probably also low due to the fact that much of CRW's distribution system is young by most standards – 65.2 percent has been installed since 2000.

Key Performance Indicators

By participating in the AWWA Utility Benchmarking Program, Castle Rock Water tracks many metrics in order to benchmark the utility against other utilities nationwide, in support of the Castle Rock Water's efforts to be a national leader. Several key performance indicators associated with the water system integrity are Apparent Water Loss and Real Water Loss; both are measures of nonrevenue water.

Apparent water loss (AWL) is the total volume of water lost due to unauthorized consumption, meter inaccuracies, and systematic data handling errors, reported as gallons per service connection per day. Apparent losses consist of unauthorized use and inaccuracies associated with metering, and systematic data handling errors. Real water losses (RWL) are true losses of water from the system, up to the point of customer metering. They consist of leakage on transmission and distribution mains, leakage and overflows at storage tanks, and leakage on customer service connections up to the point of customer metering, reported as gallons per connection per day. For both metrics, CRW places between the 25th percentile and the median.

	Combined Utilities Reporting			
2022 KPI	CRW	25th percentile	Median	75th Percentile
AWL	5.0	2.7	5.2	9.3
RWL	21.6	22	36.6	66.1

As part of the Colorado Water Loss Initiative (CWLI), in 2022 CRW chose to participate in a test of the accuracy of the flow meters at the five water treatment plans (excluding Bell Mountain Ranch). The test results showed that all meters tested are accurately measuring flow. The Ray Waterman Red line meter was the only test to be outside of the margin of error, but still was within +/-2%. The total uncertainty of the volumetric tests is between +/- 1.3% and +/-2.0% for all tests, taking into consideration uncertainty associated with meter totalizer resolution and tank reference volume calculation.

Preventive Maintenance

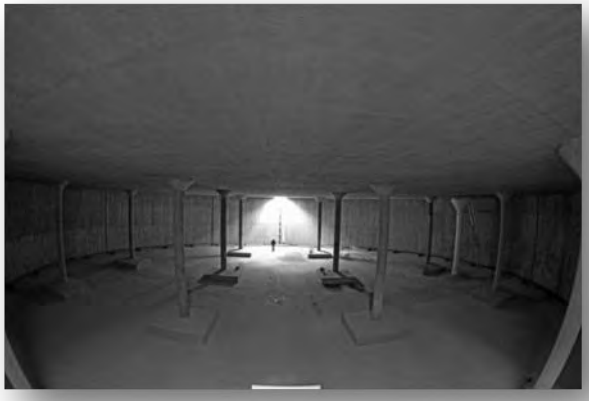
The Operations Division is charged with delivering safe and reliable drinking water to the Town of Castle Rock. This charge mandates that equipment is kept in proper operating condition at all times. The Plant Maintenance Division has an established Preventive Maintenance (PM) program to keep mechanical and electrical systems in good, working order.

Pressure Reducing Valve Inspections

Pressure Reducing Valve (PRV) stations are an integral component of a water distribution system. Due to varying elevations within a distribution system, the system must be divided into pressure zones. The pressures within these pressure zones are regulated and maintained by complicated pressure sensors and valve systems (PRVs), of which there are 73 active PRVs in the Town's distribution system (note: there may be multiple PRVs at a single location). To ensure the proper function of these valves, crews inspect and maintain these valves on a quarterly basis. In 2022, PRV inspections totaled 51 tasks, 21. 25 hours, and a labor cost of $12,198

Tank Cleaning and Inspection

Water storage facilities within the distribution system provide storage of treated water for fire protection, meeting consumption demands, and maintaining steady pressures for consistent operations. To maintain the high quality of water being delivered to the distribution system by our water treatment plants, Castle Rock's 16 active water storage tanks are cleaned and inspected every two to three years by Castle Rock Water's staff. The cleaning and inspection of these tanks require the investment of both Operations and Engineering staff. It requires a crew of five employees approximately forty hours to drain, clean, inspect, disinfect, fill and return the tank to service. Time and materials is approximately $6,500 per tank, or $37,000 annually for the entire program.



Tank 6C inspection prior to filling and placing in service.

Water Quality

Sampling and Compliance Testing

A substantial number of water samples (over 100 per month, on average) are collected for analysis throughout the year from Castle Rock's source water(s), the finished water at the treatment plants, and throughout the distribution system. A majority of these samples are collected for the purpose of ensuring compliance with the stringent state and federal regulations that surround drinking water utilities. Others are for internal data collection and to monitor conditions in the distribution system. The water quality staff also communicates with customers and responds to water quality complaints/inquiries. The investigation itself typically includes an on-site investigation of the issue. The water quality staff may request assistance or input from other divisions, depending on the nature of the issue. Staff then collaborate to resolve the issue or to educate the customer on the nature of the situation. A record of these investigations is kept on file for reference.

Key Water Quality Performance Indicators:

The Key Performance Indicator in regards to Regulatory and Water Quality is the compliance ratio. Specifically, the number of days in compliance with applicable regulations divided by 365 days for the year. Castle Rock Water has had one hundred percent compliance since 2014.

One other key performance indicator that is tracked is the number of technical service complaints divided by the total number of water accounts. The AWWA national standard to be in the top quartile of water providers is less than 2.1 percent technical water quality complaints. For all of 2021, Castle Rock Water's technical service complaints rate was 0.2, (the number of complaints per total accounts), placing CRW in the top quartile among surveyed utilities, exemplifying the commitment of staff to provide the best quality water one hundred percent of the time.

System Optimization

Castle Rock Water uses the hydraulic model to investigate ways to optimize the system. Examples of things that can be investigated include:

- Where to complete or upsize pipes to efficiently move water around town, reduce pressure losses or increase fire flow capability;
- How to manage tank levels to ensure disinfection residual and good water quality;
- Where to include pressure reducing valves to modulate system pressures;
- When and where might additional storage in the system be warranted;
- When do pipes need to be upsized to transport increased flows or to meet peak hour demands;
- When does additional pumping capability need to be added?

Modeling results help determine existing system operational modes, but also help define the future capital plan.

7. Rates and Fees and the Financial Management Plan

Annually CRW completes a rates and fees study. For common understanding, “rates” refers to the collective monthly fixed charges and volumetric rates billed to existing customers. “System Development Fees” is a general term used for Water, Water Resources and Wastewater System Development Fees (SDFs) and Stormwater Development Impact Fees (DIFs). Water, Water Resources and Wastewater SDFs are calculated and assessed at the time of permitting for the right to access existing system capacity and for payment of a proportionate share of the capital cost required for new capacity to meet the potential demand the new customer is expected to place on the system. SDFs ensure that growth pays for the cost of growth. The steps for completing this year’s study, as in previous studies, are grounded in industry standards for cost-of-service ratemaking as summarized in the American Water Works Association’s AWWA Manual M1. As in prior years, work products include the following tasks:

- Growth Forecast
- Customer Characteristics Analysis
- Capital Improvement Projects (CIP) Forecast Updates
- Revenue and Expenditures Forecast Updates (in conjunction with budgeting)
- Rates & Fees Modeling
- Cost of Service Modeling
- Community Engagement

For the sixth year in a row, Castle Rock Water has engaged Stantec Consulting Services, Inc. to assist with preparation of the rates and fees study. To reduce costs, Castle Rock Water staff continued to prepare the Customer Characteristics Analysis in-house for the 2022 Study. However, Stantec prepared the System Development Fees Models, Financial Rate Models, and the Cost of Service Models for the 2022 Study.

Growth Forecast

The last five years have been high-growth years, exceeding 800 new single family attached and detached homes per year, and also a significant increase in multi-family permits. Nevertheless, for planning and budgeting purposes, Castle Rock Water tries to be conservative in estimating future growth, especially with respect to input in the annual cost of service rates and fees study. However, the rate of growth has implications for the timing of capital projects. Planning data was collected from the Town’s Development Services Department, and the past 5-year growth scenario is shown below in Table 7-1.

Table 7-1
Town’s 5-Year Growth Projections/Actuals in SFEs

Year	2017	2018	2019	2020	2021	2022
Projected SFEs	800	800	800	800	800	800
Actual SFA and SFD units	862	1,029	901	1,086	1,167	638

Actual MF units	402	372	23	293	538	320
Total New SFEs	1,131	1,278	916	1,282	1,527	852

Note: multifamily units count as a 0.67 SFE for modeling and demand projections.

The growth forecast for customers in Town continues to be developed in conjunction with Development Services based on both historical performance, discussions with developers and home builders, and anticipated changes to economic conditions in the coming year. Customers that may be served through extraterritorial agreements are evaluated by Castle Rock Water and added to the totals within the Town boundaries as appropriate. Growth forecasts include all customer classes converted to single family equivalents.

The projected 2022-2027 growth projections are shown in Table 7-2 below.
Note, budget SFEs are only used for budget purposes and are generally conservative so that the Town doesn't overestimate projected revenue from system development fees (SDFs). The projected actual SFEs are projected by Development Services; the higher SFE for actual expected is used for hydraulic modeling and CIP planning.

Table 7-2
SFE Projections 2022-2027

Year	2022	2023	2024	2025	2026	2027
Budget SFEs	800	800	800	800	800	Not Provided Yet
Projected Actual SFEs	942	940	716	873	866	721

For years beyond the five-year window, Castle Rock Water used an average value of 721 single family equivalents for future growth of the customer base in the financial models. Based on these growth projections build-out in the community and service to extraterritorial areas could occur by 2042, assuming current maximum estimated build-out of 125,000 people is reached.

New customers provide revenues through SDFs to fund growth-related capital projects and the monthly revenues to fund the remaining costs as an existing rate customer. Actual growth in 2021 was strong, however growth has slowed in 2022. In 2022, 677 single family home permits were issued, down from 1,167 issued in 2021.

Customer Characteristics Analysis

There were no major changes to customer characteristics affecting this year's recommendations. The topics reviewed included growth projections and how they are considered in long-range planning, residential consumption trends, and the various ways that CRW is continuing to promote conservation in the Town. In general, we have seen some favorable trends in regards to average residential consumption in recent years and will likely see additional improvements

beginning in 2023 as the proposed changes to Castle Rock's landscape and irrigation criteria manual (i.e. new limits on turf grass for new development) are implemented. CRW's customer characteristics that are analyzed in the study include the following for the water system:

- Base Water Demand
- Maximum Day Extra Capacity
- Maximum Hour Extra Capacity
- Meters and Services
- Number of Customers

The percentage of each customer class' share of each characteristic above forms the basis for allocating costs of service to each customer class.

Capital Improvement Projects Forecast Updates

Significant additions were made to the long term capital plan. Costs for renewal and rehabilitation of existing infrastructure, improvements to existing infrastructure to meet upcoming regulatory requirements, infrastructure additions driven by the renewable water program, capital investment adjustments and revenue forecast changes based on the proposed changes to Castle Rock's landscape and irrigation criteria manual (i.e. new limits on turf grass for new development), and an updated growth forecast are incorporated into the study. Capital costs are escalated by 3.00% per year in future years past 2023 consistent with the latest Engineering News Record Construction Cost Index (ENRCCI) in the financial model.

With respect to capital plans, there were some significant changes to the five-year capital plans, but there were also several major changes to the long term (>5 years out) capital plan which were made for this study year. Additional requirements for desalination related to Water Infrastructure Supply Efficiency (WISE) as well as increases in Plum Creek Water Purification Facility (PCWPF) expansion were incorporated into the Water Resources capital plan and account for a large increase in near term spending. Long term planning was impacted by upcoming proposed changes to turf restrictions on new homes and non-residential development which will reduce the future capacity needs as consumption and peak demands in new development will be significantly less than current areas of Town. Significant changes to the five-year capital plan by enterprise are summarized in Table 8-3 and in more detail below.

Table 7-3: 5 Year CIP and Long Term CIP Differences by Fund

Fund	2022 Study CIP 2023-2027	2021 Study CIP 2022-2026	Variance	2022 Study CIP thru 2065*	2021 Study CIP thru 2060
Water	$54,464,630	$45,895,546	$8,569,084	$395,956,625	$302,853,812
Water Resources	$194,430,446	$96,907,949	$97,522,497	$428,033,838	$525,619,757
Stormwater	$22,857,056	$14,409,255	$8,447,801	$149,087,566	$135,107,884
Wastewater	$22,712,590	$24,932,187	($2,219,597)	$163,584,621	$186,916,719
Total All Funds	**$294,464,722**	**$182,144,937**	**$112,319,785**	**$1,136,662,650**	**$1,150,498,172**

Note: CIP timeframe was extended through 2065 during the 2022 study

Changes by fund include:
Water Fund:

- Added $10.3M in Well Redrills
- Added $3.9M in New Wells and Waterlines

Water Resources Fund:

- Added $41.2 M for WISE Infrastructure Desalination Facilities
- Added $6.3 M for WISE Infrastructure Pipeline
- Added $12.1 M for Castle Rock Reservoir No. 2 Construction
- Added $58.8 M for PCWPF expansion
- Added $13.4 M to Plum Creek Pipeline to PCWPF
- Added $8.0 M to Plum Creek to Rueter Hess Reservoir Pipeline and Pump Station
- Added $1.3 M for East Cherry Creek Valley North-South Pipeline capacity

Stormwater Fund:

- Added $8.5M in funding for Stream Stabilization

Wastewater Fund:

- Added $0.5M in funding for the Castle Oaks Lift Station Upgrade
- Moved $2.2M for Kinner Street Bottleneck beyond 2027

Revenue Requirements

A long term financial plan is prepared to project the revenues required for each of CRW's four enterprise funds. The long-term financial plan allows the integration of debt, accumulation/use of reserves, and other assumptions to forecast funding of CRW's water system operations and maintenance (O&M) expenses and capital improvements for each respective enterprise. For each enterprise fund, the financial plan calculates the annual service charge revenue requirements. The projection period developed for each enterprise financial plan was driven by the length of the capital improvement program (CIP) and ends in 2065.

Although the projection period extends to 2065, revenue requirements and capital improvement programs are presented in this report for the 5-year planning period 2023 through 2027 for all four enterprise funds. The estimated 2023 total revenue requirements from rates are shown below in Table 7-4.

Table 7-4

Revenue Requirements From Rates for 2023	
Water	$18.8 Million
Water Resources	$14.5 Million
Wastewater	$12.1 Million
Stormwater	$3.8 Million

Concurrent with the preparation of the proposed rates and fees for 2023, staff has updated the Financial Management Plan (FMP), to ensure the study is consistent with the goals of the FMP. The FMP was completed to assist CRW in achieving the following goals:

- To minimize debt carrying costs at or below industry standards
    - *CRW continues to stay in the top 25% in the industry with the lowest debt. This is positive, but the current financial models do indicate that we will need to take out significant additional debt towards the end of this decade to keep pace with our needs for renewable water supplies and infrastructure. This debt could move us into the median category.*
- To minimize risk by balancing fixed and variable revenues with expenses as appropriate
    - *CRW focuses on keeping these matched to the extent possible while still sending a conservation oriented message with a variable rate.*
- To keep costs at or under budget for capital and operational budgets each year by fund and to continuously strive towards more efficient operations
- To keep our rates and fees competitive with surrounding communities
- To keep adequate reserves and maintain fund balances between minimums and maximums
    - *CRW continues to maintain adequate reserve balances in all funds for operating, catastrophic event, rate revenue stabilization and capital reserve.*
- To keep our rates and fees affordable within various national affordability indices
    - *Last year CRW had Stantec's help in looking at two affordability methods created by Teodoro. The first of these is the Affordability at the 20th Income Percentile (AR20). This method measures the affordability of the average water and wastewater bill to the 20th percentile income. This indicates that of the monthly disposable income for this group, 4.29% is spent on essential water and wastewater usage for CRW assuming the recommended 2023 rates are approved. The average for large cities is 12.4%, which puts CRW well below average, a positive result.*
    - *The second method is the Basic Household Water and Sewer Cost Expressed in Terms of Hours of Labor at Minimum Wage (HM). This metric shows the number of hours required for one to work at minimum wage to pay the monthly water bill. For CRW, the proposed 2023 rates result in an HM value of 8.29 hours. The average for large cities is at 10.1, which puts CRW slightly below average, again a positive result.*
- To develop regional partnerships to provide economies of scale to reduce total costs of infrastructure to our customers
    - *CRW has formed many partnerships with individual water providers like Dominion and Parker and regional organizations such as South Metro Water Supply Authority, WISE Authority, Plum Creek Water Reclamation Authority (PCWRA), and Cherry Creek Project Water Authority (CCPWA), just to name a few.*
- To be an industry leader in the application of financial management benchmarking ourselves against others locally and nationally
    - *Castle Rock Water has thirty different key performance objectives and indicators (KPIs) with measurable outcomes. Many of which are*

benchmarked against other water providers nationally, regionally and locally. More information and results for these KPIs are available in our strategic plan.

Rate Analysis Results

Cost-of-Service Methodology

The basic philosophy behind a cost of service (COS) methodology is that utilities should be self-sustaining enterprises that are adequately financed with rates that are based on sound engineering and economic principles. In addition, rates should be equitable and proportionate to the costs of providing service to a given type of customer.

Once the first four steps are completed, the capital plan is put into the system development fee models along with the projected new single family equivalents that this capital will support. Proposed system development fees from these models are then put into time based financial models otherwise known as the rates and fees models, one for each enterprise fund. These models look at financial data through 2065. For purposes of this year's models, additional debt of approximately $40M was included towards the end of the decade. Castle Rock Water then works to ensure that over the modeling period (out to 2065):

- there are no large rate increases forecasted (greater than 7.5%) to be needed;
- fund balances are maintained within reasonable limits according to upcoming capital needs through 2065;
- Minimum reserves are maintained for all enterprises throughout the study period;
- Debt needed is reasonable with respect to Castle Rock Water's borrowing capacity.

If these conditions are not met, adjustments are made to the capital plan and operating expenses where changes can be made without impacting levels of service to balance these items. Revenue requirements for each enterprise are then determined from the models based on the change in revenue needs for each enterprise according to the forecast capital and operational expenses. Once the total revenue requirements are identified in each enterprise, cost of service models are used to spread those revenue requirements over the different customer classes. The end results are the rates and fees recommendations.

Proposed Rates and Fees for 2023 through 2027

Based on impacts of the revised capital plan and projected system growth by fund as well as the other key changes, the "2022 Study" has resulted in projected required rate revenue increases as shown in Table 7-5 below.

Table 7-5: Rate Required Revenue Increases by Enterprise – 2022 Study

	2023	2024	2025	2026	2027
Water Fund	4.5%	3% to 4.5%	3% to 4.5%	3% to 4.5%	3% to 4.5%
Water Resources	7.5%	3% to 7.5%	3% to 7.5%	3% to 7.5%	3% to 7.5%
Stormwater	4.5%	4.5%	4.5%	4.5%	4.5%
Wastewater	0.0%	0.0%	0.0%	0.0%	0.0%

Table 7-6 summarizes proposed monthly fixed charges for 2023 from this year's study.

Table 7-6: Single Family Residential Monthly Fixed Charges

	2022 Actual Typical Bill	"2022 Study" Proposed 2023 Typical Bill	$ Change	% Change	"2021 Study" Proposed 2023 Typical Bill
Water	$9.54	$9.97	$0.43	4.5%	$9.83
Water Resources	$26.93	$28.95	$2.02	7.5%	$26.93
Wastewater	$8.57	$8.57	$0.0	0.0%	$9.02
Stormwater	$7.30	$7.63	$0.33	4.5%	$7.33
TOTAL	**$52.34**	**$55.12**	**$2.78**	**5.3%**	**$53.11**

System Development Fees

Moreover, is the expectation that growth pays for growth and that system development fees should reflect and support this development model. New customers provide revenues through SDFs to fund growth-related capital projects and the monthly revenues to fund the remaining costs as an existing rate customer. Actual growth in 2021 was strong, however growth has slowed in 2022. Single family home permits issued in 2022 are down forty-two percent from those issued in 2021. Budgets have been adjusted to reflect a lower growth figure, however, if growth falls short of this forecast, revenues are at risk with the severity and service delivery impacts dependent upon the depth of the shortfall. Growth in 2023 and beyond is difficult to predict. As a result, Castle Rock Water uses a conservative approach to estimating future growth. If growth falls short of current forecasts, revenues in 2023 and beyond could fall short of requirements for the current capital plans requiring a delay on some of these projects. Similarly, if growth significantly exceeds current forecasts, capital projects will need to be moved forward. Castle Rock Water uses our water supply and demand model to evaluate the pace of growth as it relates to our capital improvement plans to ensure that we have the ability to react to changes in actual growth relative to the projected growth.

SDFs for Water Fund

On an annual basis, Castle Rock Water conducts a comprehensive rates and fees study for water, water resources, wastewater, and stormwater. The purpose of this study is to provide CRW with a comprehensive and updated review of its System Development Fees (SDFs) and the underlying assumptions that are used to calculate the 2023-2027 fees.

Methodology

For calculating SDFs there are two commonly accepted methodologies. They are the equity buy-in approach and the incremental cost (or improvement) approach. A third approach that is also acknowledged by the American Water Works Association (AWWA) and the Water Environment Federation (WEF) is the combined or hybrid approach. This hybrid method is used to calculate CRW's water, water resources and wastewater SDFs, which is summarized below.

For stormwater, the incremental cost approach is used to identify remaining capacity to serve growth. It is assumed that CRW's existing infrastructure and improvements have no available capacity for new development and capital improvements are available to provide runoff capacity for new customers.

Equity Buy-In Approach
The equity buy-in approach is most appropriate in situations where new customers can be served by the existing system. Under this method, new customers pay a proportionate share of the value of the existing infrastructure. The AWWA recommends that the equity method is best used within systems that have adequate capacity to serve both existing and future customers without major system expansions.

Incremental Cost (Improvement) Approach
The incremental cost approach is most appropriate when the existing system is at or near its maximum capacity and new customers cannot be served without significant investment in infrastructure. Under the incremental cost approach, new customers pay a proportionate share of the expansion related costs of the new infrastructure. The SDF is calculated using the capital improvement plans (CIPs) developed in CRW's master planning process.

Combined Approach
The combined approach can be the most appropriate approach because new customers tend to use capacity available in the existing infrastructure (buy-in), as well as new capacity that the utility must build in order to accommodate growth and the additional units to be served (incremental cost). This method best conforms to "growth pays for growth" policies, which is also CRW's policy.

With the combined approach, the equity method and incremental cost method are essentially combined so that new customers of the utility pay for their share of the existing system equity, as well as their share of the capacity expansion costs. The equity portion of the connection fee is called the buy-in component and the incremental cost portion of the fee is referred to as the improvement component.

The combined approach as follows for water, water resources and wastewater SDFs complies with the criteria for impact fees required in the Colorado Revised Statutes (CRS) 29-20-104.5. This statute requires that SDFs and impact fees are:

- Legislatively adopted
- Applied to a broad class of property
- Recover the costs imposed by proposed development

The incremental cost approach for the stormwater development impact fees also complies with CRS 29-20-104.5.

Capacity Definitions
Defining capacity in both the existing infrastructure and new capital improvements is a critical step in determining SDFs. Moreover, defining capacity required by a single-family equivalent user is required for each of the SDFs and the stormwater development impact fee. For CRW, the following assumptions on capacity definitions apply:

- A single-family equivalent (SFE) is a measure of the amount of water/wastewater flow required to meet potential demand of a single-family detached residence.
- For the water and water resources systems, one SFE is assumed to require 400 gallons per day (GPD).
- For the wastewater systems, one SFE is assumed to require 220 GPD of flow capacity.
- For stormwater capacity, one SFE equals 3,255 square feet (sq. ft.) of impervious area.

Equivalency Schedule

There are two different types of equivalency schedules. The first is the hydraulic capacity method in which is based on the relative capacity of different meter sizes and meter types utilized to deliver water. These can also be based on the relative potential demands of different customers. Based on the characteristic hydraulic demands, a single family meter size of ¾" is designated as the base for one SFE. The maximum flow rate of water through the meter in gallons per minute (gpm) becomes the unit of comparison. The maximum flow rate demanded by new customers is compared to the base demand in order to determine the equivalency ratio. For example, if the base single family residential customer requires 30 gpm and a commercial customer requires 200 gpm, the equivalency ratio equals 6.67.

The second method is the actual use equivalency schedule, which is based on the relative average monthly water usage of CRW's customers. Average monthly use per account by meter size was calculated using a 2014 to 2016 three-year average of monthly consumption data from the customer characteristics memo. The average usage of a single family residential meter size is designated as the base. The average usage of larger meter sizes is divided by the base usage to calculate equivalent ratios. The actual use equivalency schedule is what was used to calculate the SFEs for the water, water resources and wastewater SDFs. These ratios are shown in Table 7-7 below.

Table 7-7 Calculated Meter Equivalency Ratios

Meter Size	Max Flow Rate (GPM)	Equivalent Meter Ratios
5/8" x ¾"	20	0.67
¾"	30	1.00
1"	50	4.40
1.5"	100	9.32
2" C2	200	11.20
2" T2	250	18.31
3" C2	500	18.28
3" T2	650	34.96
4" C2	1,000	132.76
4" T2	1,250	98.20
6" C2	2,000	110.49

System development fees (SDFs) are a function of year-end 2021 fixed assets, 2022 year-end estimates of capital improvement project costs, 2023 through 2065 capital improvement project plans, and system capacity for water, water resources, and wastewater and developable acres for stormwater.

Growth forecasts and increases to the capital plans in the "2022 Study" indicate that total SDFs for a typical SFE will need to increase from the 2022 adopted fees. The "2022 Study" indicates fees will need to increase in 2023. The recommended increase this year is approximately 13.3% as shown in Table 7-8.

Table 7-8: Single Family Equivalent System Development Fee Comparison

PLUM CREEK BASIN

	2022 Actual Fees	"2022 Study" Proposed 2023 Fees	$ Increase (Decrease)	% Change	"2021 Study" Proposed 2023 Fees
Water	$5,700	$6,270	$570	10.0%	$5,700
Water Resources	$26,458	$30,383	$3,925	15.0%	$26,458
Wastewater	$4,909	$5,400	$491	10.0%	$4,909
Stormwater	$2,128	$2,339	$211	10.0%	$2,128
TOTAL	**$39,195**	**$44,392**	**$5,197**	**13.3%**	**$39,195**

CHERRY CREEK BASIN

	2022 Actual Fees	"2022 Study" Proposed 2023 Fees	$ Increase (Decrease)	% Change	"2021 Study" Proposed 2023 Fees
Water	$5,700	$6,270	$570	10.0%	$5,700
Water Resources	$26,458	$30,383	$3,925	15.0%	$26,458
Wastewater	$4,909	$5,400	$491	10.0%	$4,909
Stormwater	$1,116	$1,228	$112	10.0%	$1,116
TOTAL	**$38,183**	**$42,281**	**$5,098**	**13.4%**	**$38,183**

Uses of Funds

The financial plans allow the integration of debt, accumulation/use of reserves, and other assumptions to finance the Town's utility system operations and maintenance (O&M) expenses and capital improvements for each respective utility. Using ratemaking terms, the financial plan calculates for each utility fund the annual user charge revenue requirements. These are based on the cost of providing utility service. The projection period developed for each utility financial plan was driven by the length of the Capital Improvement Program (CIP). The projection period for the water fund is 53 years, from fiscal year 2022 through fiscal year 2065. In the CRW 2022

report, revenue requirements and capital improvement programs are presented only for the 2023 through 2027 study period.

Uses of funds include all expenditures, either operating or capital and any reserve requirement or increase in fund balance CRW plans to achieve. The major assumptions for uses of funds are as follows.

- Operating Expenses – For the water fund most operating costs are fixed; meaning not varying based on the volume of water sold; with the exception of energy, treatment chemicals and certain other supplies, which vary with production.
- Personnel Services – CRW reviews full time equivalent (FTE) needs each year to determine how many new FTEs are projected over the budget period and includes these into the expense projections. The total projected FTEs for all four enterprise funds for the five-year period is 13 new FTEs.
- Supplies – The supplies for the water fund are expected to remain consistent over the five-year study period at about $2.0 million a year.
- Energy Costs – Over the five-year study period these are expected to increase at an average rate of approximately 3%.
- Capital Improvements – Total water system capital improvement costs from 2023-2027 are expected to be $54.5 million in today's dollars. Only improvements and replacements that provide benefits to existing customers are included in revenue requirements. Improvements to serve growth are funded from SDFs.
- Inter-Fund Loans – The water fund does not have an Inter-Fund loan balance that it is paying on at this time as an expense.
- Transfers Out – These include the costs for the vehicle replacement fund which is transferred to the fleet department for about $2.1 million over the five-year period.
- Fund Balances – When fund balances are drawn down from initial balances, the use of those funds is a source of funding to cover water fund expenses. When it is building the fund balance it is a use of funds as cash is added to the water operating fund. These are projected to be kept at an acceptable level of working capital, which is a minimum of 60 days O&M in the operating reserve. This also conforms to the FMP goal to keep adequate reserves and maintain fund balances between minimums and maximums.
- Debt Service – The water fund currently has two outstanding revenue bond issues (2012 and 2015). The 2012 bond issue was a refinancing of 2003 and 2004 bonds and the 2015 bond issue was a refinancing of 2006 bonds. The water fund debt service amounts to approximately $1.7 million in 2023 and then drops down to approximately $687K through 2026.
- Debt Service Coverage – The debt service coverage ratio in the model is set to 1.2 times the total annual debt service amount, which is about $1.3 million. This is a bond covenant requirement.

Revenues and Expenditures Forecast Updates

As in previous year, complete revenue and expenditure forecast updates were prepared along with the budgeting process. Assuming the recommended rates are approved, the combined 2023 revenue budget for the department is $82 million and represents a 26% decrease from the 2022 budget, and a 38% decrease from the 2022 year-end estimates. These decreases are largely driven by the $30 million bond in Water Resources. When comparing 2023 to 2022, without the $30 million in bond revenue, the 2023 budget is up 1% compared to the 2022 budget

and down 20% to the 2022 year-end estimates. These revenue numbers are also being impacted by the reduced revenues projected for SDFs as a result of the proposed changes to the landscape and irrigation criteria (i.e. the 47% reduction in SDF revenue).

The combined 2023 expenditure budget associated with the major functions for the various CRW enterprises is approximately $128 million, a decrease of 14% from the 2022 amended budget and an increase of 35% over the 2022 year-end estimate. These changes are due to large changes in proposed capital spending in 2023 relative to 2022, primarily driven by the fact that many of the projects originally planned for 2022 are carrying over to 2023. Capital budgeting is variable based on long-term project planning and opportunity.

With respect to the operational budgets, the total combined budget for 2023 is approximately $49.1 million. This is a 3% increase to the 2022 Amended Budget and a 15% increase over the 2022 year-end estimate. The increase over the 2022 year-end estimate is due to increases in debt costs as the new water resources loan begins to be paid back, increases in personnel costs, increases in the amount of WISE water that will be taken as WISE ramps up towards full deliveries, increases in energy costs (i.e. CORE is going up 6% across the board for energy), and increased costs for supplies partly as a response to supply chain deficiencies and also cost impact to suppliers. CRW is also requesting five new positions: a Stormwater Inspector, a Water Efficiency Technician, a Collection System Operator, an Office Assistant, and a SCADA Instrument Technician.

The 2023 capital budget across the CRW enterprises is approximately $78.9 million, a 22% decrease over the 2022 Amended Budget and a 52% increase over the 2022 year-end estimates. Revenue and expense forecasts were completed through 2027 and then escalated in the model for years past 2027.

Fund Balances

Based on the revenue and expense forecasts, fund balances are reviewed through 2027 closely and more generally through the entire modeling period out to 2065. Savings in actual costs and the timing of spending on capital costs verses budgets each year have helped to keep fund balances stable throughout the years and projections through 2027 continue this trend except that in 2026 to 2030 timeframe a significant debt issuance is predicted in the Water Resources Enterprise to keep fund balances above minimum levels. Fund balances need to be built up with capital reserves ahead of large capital projects to ensure the money is available to proceed on the projects when the projects are needed to meet growth and other service goals. Fund balances are then drawn down significantly as capital reserves are spent on these projects. Keeping close tabs on the fund balances ensures that there are no negative impacts on the long term financial plan when large projects must be funded.

Fund balance for the Water Fund is projected to dip below average values of $17M through 2026 and then recover in 2027 to above average levels. In the Water Resources Fund, values have increased, partially due to the $30M debt issuance in 2022. Fund balances will remain high and funding is maintained for critical near-term projects. Current modeling indicates that debt issuance may be needed near the end of the five-year planning window to meet full capital needs. Stormwater Fund balance hit a value at the end of 2021 of around $13M and then is

projected to fall to $3.4M by year-end 2027. Wastewater Fund balance increased to around $22M at year-end 2021. The balance will continue to grow in the near-term ahead of large capital requirements in the 2030's.

Rate Revenue

While fixed revenues in the four enterprise fund models are set to generally trend up with the projected growth, variable revenues can be difficult to predict. These variable revenues are subject to two primary drivers, 1) weather and 2) national, state and local pressure to conserve water or at least use it more efficiently. For the 5-year planning period, CRW is forecasting annual increases of about 7% per year through 2027. For new houses and new development, rate revenue is projected to be less than previous estimates due to the proposed changes to landscape and irrigation criteria. As always, Castle Rock Water is aware of the need to be cautious when projecting rate revenues due to the unpredictability of weather, conservation efforts and sustainable growth.

Non-Rate Revenues

Non-rate revenues are generated through charges and fees for miscellaneous or ancillary services not accessed or used by the broader customer base. These special charges should recover the actual cost of service delivery consistent with cost-of-service principles and Town financial policies. Recovering costs directly from customers that access those services also enhances equity. These charges can also help manage demand for those services as well as address customer behavior patterns. In these cases, Caste Rock Water may set a special charge above the cost of service. Two examples of this include the Residential Landscape and Irrigation Inspection Fee and Meter Set Inspection Fees. Castle Rock Water was having issues with home builders failing these inspections multiple times which created resource issues for the department. As such, these fees were set to escalate after each failed inspection starting in 2022. Other special charges include late charges, disconnection charges, service transfer charges and administrative related fees, just to name a few.

Personnel

The 2023 budget includes five new full time equivalents (FTEs). These include a Stormwater Inspector, a Water Efficiency Technician, a Collection System Operator, an Office Assistant, and a SCADA Instrumentation Technician. From 2024 to 2027, Castle Rock Water is projecting to add eight FTEs, including a Customer Service Representative, a Plant Mechanic, and a Field Services Operator in 2024; a Lab Supervisor and a Plant Mechanic in 2025; a Field Services Operator in 2026; a Water Quality Technician and Field Service Operator in 2027. The Study reflects updated personnel cost allocations across the four enterprises to capture cost-of-service impacts on personnel resources, as well as Town-wide changes to the pay and benefits plans. After 2027, costs for personnel are escalated by 1.55% which is consistent with the long-term historical average CPI.

Electricity

The third largest operating cost, electricity, reflects full operation of the Plum Creek Water Purification Facility and other treatment plants, alluvial and groundwater well operations and pumping associated with water and wastewater service. Castle Rock Water has implemented an energy management and system optimization plan to maximize the efficiency of electrical usage. CORE, Castle Rock Water's electricity provider, increased rates in August 2022 by 6%. Electricity costs in 2023 have been adjusted to account for this mid-year increase and rates for the remainder of the five-year period assume an annual increase of 3%. After 2027, electricity costs are escalated by 1.55% consistent with the long-term historical average CPI.

Operations & Maintenance

Cost projections include operating and maintenance costs for CRW. Items impacting operating costs during the five-year planning period include:

- Meter costs under supplies are going up significantly as we transition to advanced metering infrastructure
- Operating costs for WISE will continue to increase as the full quota of Castle Rock's WISE water is delivered with that occurring in 2026
- Personnel costs have risen significantly in response to staffing shortages and competition for labor across the region with Castle Rock Water and the Town as a whole taking action on this issue in 2022
- CORE has increased rates for electricity by 6% across the board
- Stormwater is adding significant operational costs associated with a program for the inspection of aging corrugated metal stormwater pipes

This results in increases of 37% over the five-year period. To ensure only costs needed are included in the budget, line item details are reviewed. After 2027, operations and maintenance costs in the model are increased by 1.55% consistent with the long-term historical average CPI.

Utilization of Rates and Fees

Figure 7.1 summarizes how revenues are used by Castle Rock Water.

From this figure it is clear that the Capital Project Plan is a very significant portion of the rates and fees needed for operation of the funds. The infrastructure intensive nature of the business results in significant fixed costs. Castle Rock Water wants to continue to implement a strategy, to the extent possible within our cost-of-service model, which matches fixed revenues with fixed costs to ensure revenue stability thereby minimizing the potential for future rate shocks. This strategy also takes into account the need to incentivize water conservation and efficiency through variable rates for water use.

Figure 7.1
2021 Costs by Function

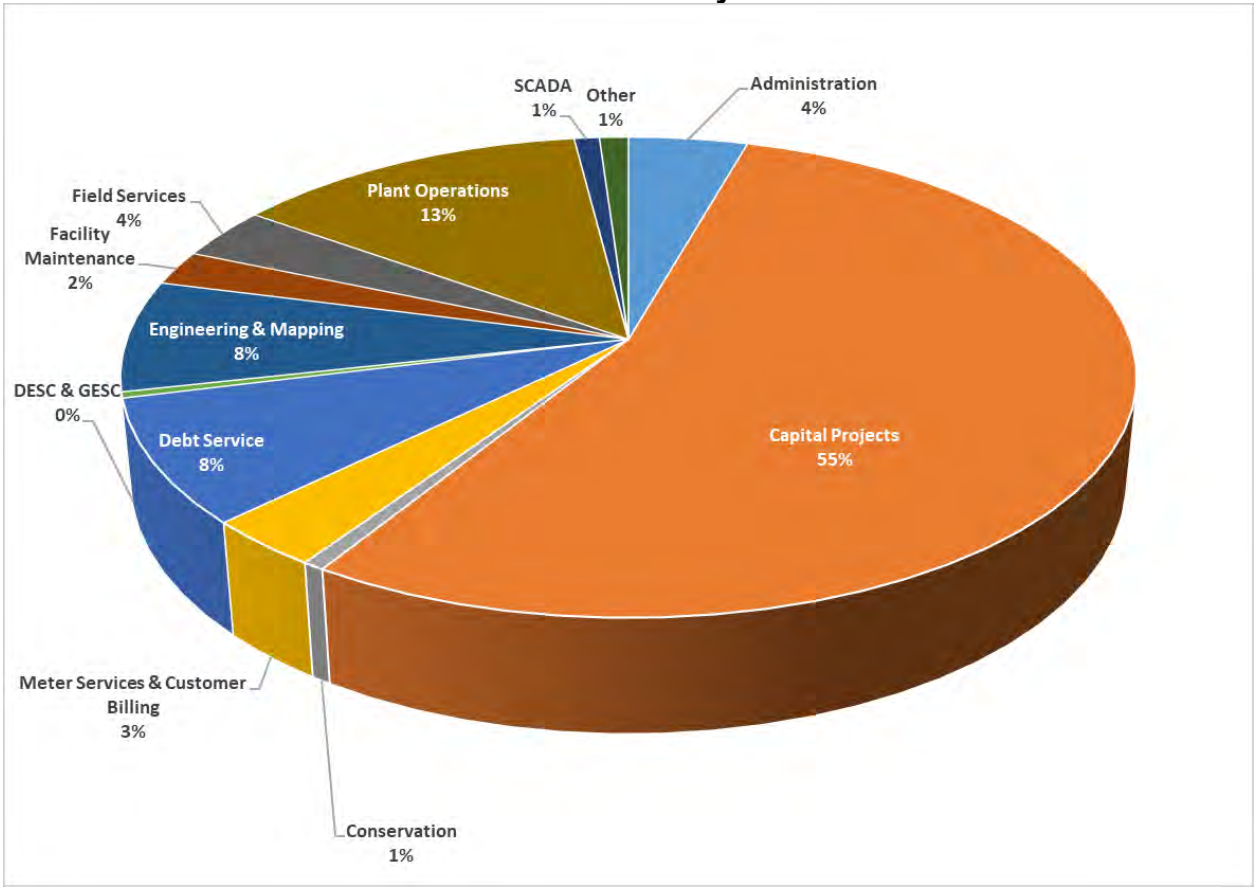
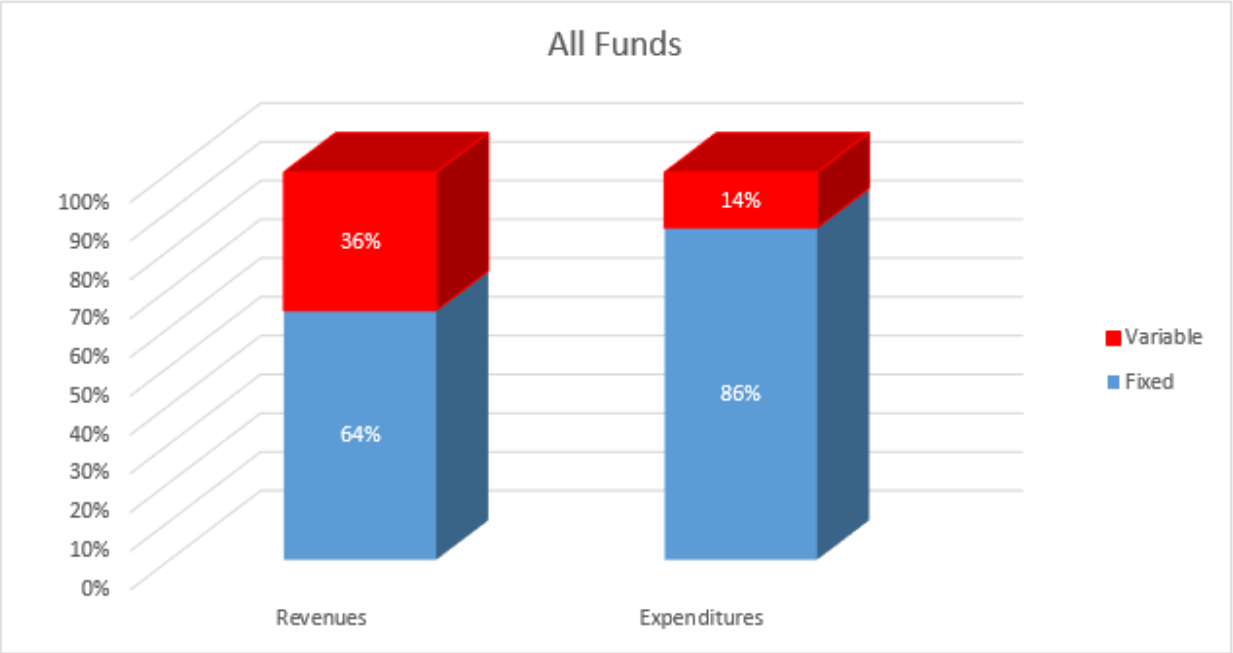


Figure 7.1 shows the breakdown between fixed and variable revenues and expenses for the fiscal year ending 2021. Variable revenues account for 36% of total revenue, with metered water sales being the largest components. The majority of expenditures for CRW are fixed in nature with the largest operational cost being personnel costs.

Figure 7.2
Fixed Versus Variable Revenues & Expenditures



Castle Rock Water compared the 2023 proposed rates and fees with other similar water providers in the South Metro area. Many of the water providers do not provide stormwater services, so we show these separately for accurate comparison purposes. The benchmarking comparisons include all fees related to water, water resources, and wastewater services. These fees have different names across the various water providers including for example water and sewer service fixed and volumetric fees, water resource fees, renewable water fees, capital improvement fees, sewer system replacement fund fees, and groundwater protection fees. The results of this comparison show that CRW remains consistently in the middle of the pack for rates and fees, and is slightly higher than the middle for SDFs.

Community Engagement

For consistency and transparency, there is continual messaging on rates and fees to customers year-round via standard methods including email, newsletter, website and social media. Messaging about rates and fees typically includes information on the annual rates and fees study, how the funds are utilized and that Castle Rock Water is a cost of service entity. Additionally, customers are always notified of rate changes when Town Council approves them and again in January when they go into effect. For the new 2023 rates, notice was placed in the Your Town Talk and in the monthly email.

References

AWWA, Manual M11 – Principles of Water Rates, Fees and Charges

BMC Consultants, Energy Management Master Plan for Town of Castle Rock Utilities Department, Phase 1, 2013.

CH2MHill, Inc., Town of Castle Rock 2006 Water Facilities Master Plan, 2006

Colorado Water Conservation Board, Colorado Water Loss Initiative, Final Report, October 2020

Malcolm Pirnie, Inc. 2009. Ray Waterman Water Treatment Plant Study Report, 2009

Red Oak Consulting, 2015 Utilities Rates and Fees Study – 2011-2015 Rates, 2015

Town of Castle Rock, Water Resources Master Plan, 2010 Update

Browns Hill Engineering, SCADA Master Plan, December 2016

Castle Rock Water, 2013, Energy Management Master Plan (EMMP) – Phase 1

Castle Rock Water, 2015 Water Efficiency Master Plan, Final July 21, 2015, Revised February 2016

Castle Rock Water, Water Resources Strategic Master Plan, 2016

Castle Rock Water, Water Resources Strategic Master Plan, 2021

Castle Rock Water, Business Solutions Group, 2022 Rates and Fees Study Update, Volumes 1 and 2

Castle Rock Water, Rehab and Replacement Plan, Draft, 2022

Jacobs, 2019 SCADA Master Plan, October 2019

Total Water Management, EPA/600/R-12/551; July 2012Utilities

Town of Castle Rock

Agenda Memorandum

Agenda Date: 4/26/2023

Item #: 5. **File #:** WC 2023-043

To: Members of the Castle Rock Water Commission

From: Mark Marlowe, P.E., Director of Castle Rock Water

Resolution Naming the Anderson Blue Zone Pump Station *[1760 Meadows Blvd.]*
Town Council Agenda Date: May 16, 2023

Executive Summary

As outlined in Resolution No. 2013-56, A Resolution Adopting an Amended Town of Castle Rock Facility Naming Policy (***Attachment B***), the goal in selecting names for Town facilities is fostering a sense of community. This includes names that call attention to people who have helped shape the Town. The resolution further specifies that naming nominations can be submitted at any time, and that the Town Manager shall chair a Town staff committee for reviewing nominations for further consideration and/or recommendation.

The Castle Rock Water Department recently submitted a naming rights application (***Attachment C***) to name the Blue Zone Pump Station at 1760 Meadows Blvd. the Anderson Blue Zone Pump Station, in honor of 27-year Castle Rock Water employee Monty Anderson, who recently lost his battle with cancer. A committee consisting of Town Manager's Office and Castle Rock Water staff have reviewed the nomination and recommend approval of a resolution (***Attachment A***) to name the Anderson Blue Zone Pump Station.

The 10 pump stations within Castle Rock Water's system help get water to where it needs to go. The Blue Zone Pump Station is located along Meadows Boulevard near the Watercolor area (***Attachment D***). Rehabilitating the pump motor starter equipment at the station is one of the last projects Monty Anderson was part of at Castle Rock Water. His efforts greatly improved the facility's operation and efficiency, which is the reason the Water Department recommends naming it in his honor. Additional examples of Monty's skills and contributions to the community are in the attached nomination.

Proposed Motion

"I move to recommend to Town Council approval of the Resolution as presented"

Attachments

Item #: 5. **File #:** WC 2023-043

Attachment A:	Resolution (Not Attached)
Attachment B:	Resolution No: 2013-56
Attachment C:	Major Element Naming Rights Application
Attachment D:	Location Map

RESOLUTION NO. 2013-56

A RESOLUTION ADOPTING AN AMENDED TOWN OF CASTLE ROCK FACILITY NAMING POLICY

WHEREAS, the current adopted Town of Castle Rock Facility Naming Policy has a section reserved for Naming Rights for Financial Consideration; and

WHEREAS, the goal is to provide an opportunity for companies and individuals to contribute significant donations to project in exchange for recognition; and

WHEREAS, the desired process for Naming Rights includes review by Town staff, Boards and Commissions and Town Council.

NOW, THEREFORE BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF CASTLE ROCK AS FOLLOWS:

Section 1. **Adoption.** This resolution shall serve as the Town's policy on naming of Town facilities effective upon its adoption by the Town Council and remain in force and effect until amended or rescinded (Facility Naming Policy). The Facility Naming Policy shall read as follows:

TOWN OF CASTLE ROCK
FACILITY NAMING POLICY

1.1. Town facilities for purposes of this Facility Naming Policy include, but are not limited to, public buildings, parks, trails, open space and arterial streets.

1.2. The Facility Naming Policy goal in selecting names for Town facilities shall be primarily to advance fostering a sense of community and small town character. This includes name which heighten the awareness of Town history, celebrate the natural environment and call attention to points of pride in our community, to people, events and geography that have shaped the Town, create our sense of place make our community unique. It is recognized that there will be instances in which name regarding a special tribute, a memorial, a geographic feature of a modern neighborhood may be appropriate.

1.3. Nominations in general or for a specific facility may be submitted at any time by any person utilizing a form provided by the Town to be generally available in Town facilities, communication and web site. The Town Clerk shall be responsible for receiving and maintaining an inventory of nominations. The Town Council and/or the Town Manager also reserve the right to establish a naming contest for a specific Town facility.

1.4. The Town Manager and/or designee shall chair a Town Staff committee responsible for establishing and/or prioritizing Town facilities in need of a name,

for reviewing nominations received and/or generating new nominations, and for selecting nominations for further consideration and/or recommendation (Naming Committee).

1.5. The report of the staff committee on the naming of a Town facility shall first be submitted to the Town Board or Commission most closely involved with the facility to be named. For example, the Parks and Recreation Commission shall review naming reports for parks, recreation, trails and open space facilities; the Utilities Commission for water, sewer and storm water facilities; the Public Works Commission for transportation and street facilities, the Public Safety Commission for police and fire facilities; the Public Art Commission for public art facilities, and the Planning Commission for general government facilities.

1.6. The Board or Commission shall consider the staff report, consider any additional public and Board/Commission input, and by majority vote make a recommendation to the Town Council for the naming of a particular facility. While the Board/Commission may recommend a name not included in the staff report, the Board/Commission is expected to respect the process established herein and adhere to the policy goals established herein.

1.7. The Board/Commission report and staff report shall then be submitted to the Town Council for final action. Final action of the Town Council shall be in the form of a Resolution established the name of the facility and the history, circumstances and reasons for the approved name.

1.8. Following Town Council approval of the name of a facility, Town staff shall be responsible for creating signage, on-site public information, community information and dedication ceremonies as appropriate.

1.9. Naming Rights for Financial Contribution. Companies or individuals wishing to contribute funding to a project or facility may request naming rights if the donation makes a significant impact to the capital construction or long-term operation of the facility. The application for Naming Rights for Financial Contribution will be available at the request of the donor. Each request will be evaluated on its own merits. The Town reserves the right to immediately remove the name of and rename any Town facility if the person/entity for which it is named turns out to be disreputable or subsequently acts in a disreputable way.

1.9.1. Major Elements: A company or individual wishing to have naming rights to a major element of a facility (such as buildings, parks, etc.) shall complete a Major Element Naming Rights application and submit it to the Town Clerk. The completed application will be initially reviewed by the Naming Committee along with the appropriate department head for the facility using the guidelines set forth by the Naming Committee. If the application is agreeable, the process for adopting the name will be the same as any other naming nomination, being approved by Town Council by resolution.

1.9.2. Minor Elements: A company or individual wishing to have naming rights to a minor element of a facility (such as, but not limited to a meeting room, ball field or any element of a facility that is distinguishable) shall complete a Minor Element Naming Rights application which will be submitted to the Town Clerk and reviewed by the appropriate board or commission using the guidelines set forth by the Naming Committee. Such recognition shall be approved by the appropriate department director and Town Manager and/or designee.

1.9.3. Other Recognition Opportunities: Other opportunities for recognition may be established with any facility project or within any department. Such opportunities may include, but are not limited to: recognition bricks or plaques at the facility site; temporary signage in or at a facility; program names, logos on t-shirts or other printed materials. Such opportunities shall be established by the department.

PASSED, APPROVED AND ADOPTED this 1st day of October 2013, by the Town Council of the Town of Castle Rock, Colorado, on first and final reading by a vote of 7 for and 0 against.

ATTEST:

Sally A. Misare Town Clerk

TOWN OF CASTLE ROCK

Paul Donahue, Mayor

Approved as to form:

Robert J. Slentz, Town Attorney

Approved as to content:

for Mark Stevens, Town Manager

TOWN OF CASTLE ROCK COLORADO

Item # 6

Meeting Date: Oct. 1, 2013

AGENDA MEMORANDUM

To: Honorable Mayor and Members of Town Council

From: Kristen Trbovich, Park and Recreation Business Analyst

Title: Resolution No. 2013-56: A Resolution Adopting an Amended Town of Castle Rock Facility Naming Policy

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Executive Summary

The current Town facility naming policy allows for public nominations of potential names that follow the Town's vision for new and unnamed facilities. Nominations are reviewed by a staff committee and submitted to the appropriate Board or Commission and finally approved by Town Council.

The adopted policy has a place holder for naming rights and recognition in exchange for financial contributions. Staff is proposing a resolution adopting an amended naming policy to fill that place holder. The new section in the policy is section 1.9 and it outlines the procedure for recognition (e.g. naming rights) in exchange for contributions toward Town facilities.

The proposed section breaks down procedures based on the type of facility or contribution being made. The three categories are:

1. Major elements: things like parks, recreation centers/field houses, other buildings.
2. Minor elements: things that are a part of a major element like meeting rooms within a building or single ball fields within a complex.
3. Other sponsorship opportunities: these are more temporary opportunities like event or program sponsorship and memorial trees and benches.

The policy only outlines the procedures for requesting recognition in exchange for a contribution. As these types of instances will each be very unique, it is difficult to create a policy that is all-encompassing of every situation that may come up. However, it is important to have some guidelines to help with decisions and to assist those who wish to pursue recognition. Therefore, the Naming Committee has developed a set of guidelines for naming rights and recognition.

The guidelines describe the different types of facilities and types of donations:

1. Major gift
2. Gift
3. Sponsorship

In addition, the guidelines outline general specifications for the types of organizations that will not be considered for naming rights (similar to the electronic sign usage guidelines). No political or religious groups, nor businesses that get a majority of revenue from alcohol, tobacco, firearms or sexually explicit material.

Staff is seeking approval of the resolution to update the naming policy.

Notification and Outreach Efforts

Staff has discussed the naming rights issue with the Castle Rock Parks and Trails Foundation to get feedback regarding how such organizations might reach out to possible donors and the community. They gave positive feedback about the policy and just want to be able to understand the Town's guidelines before soliciting donations for their projects. The Naming Committee reviewed the policy and also developed a set of guidelines to follow when reviewing naming applications.

History of Past Town Council, Boards & Commissions, or Other Discussions

Staff discussed the naming rights policy with the Parks and Recreation Commission at the June 26^{lh} meeting. The commission recommended the policy be presented to Town Council.

Discussion

The current naming policy allows for public nominations of names for Town facilities. Names should meet the following general criteria:

- Foster a sense of community and small town character
- Heighten the awareness of Town history
- Celebrate the natural environment
- Call attention to points of pride in our community
- Call attention to people, events and geography that have shaped the Town of Castle Rock

Nominations are taken in by the Town Clerk and reviewed by a staff committee chaired by the Town Manager. Following the committee selection, the nominations are passed along to the appropriate Board or Commission for review and a final recommendation is submitted to Town Council for approval.

In considering naming rights and other types of recognition for financial contribution, staff had divided the naming rights/sponsorship policy into three sections:

- Major elements
- Minor elements
- Other recognition opportunities.

Major elements include things like parks, municipal buildings, recreation centers/field houses and pools. Minor elements are things that are a part of a major element. Minor elements would be things like ball fields, meeting rooms or anything that is distinguishable in a major element. Other sponsorship opportunities include things like

legacy bricks, benches and trees, event sponsorship, temporary signage in parks and facilities, program names and other forms of temporary recognition.

Each of the three types of naming rights/sponsorships will have its own procedure.

Major Elements
Companies or individuals requesting naming rights for major elements must make a contribution that makes a significant impact on either the capital costs or long-term operations of the facility. Such requests will be taken via application and reviewed by the Naming Committee (chaired by the Town Manager or designee). They will be reviewed by the appropriate Board or Commission and then approved by Town Council. Such naming rights will be accompanied with a legal contract that outlines the donation amount and the naming rights term.

Minor Elements
Companies or individuals wishing to have naming rights for minor elements will submit an application that will be reviewed by the Naming Committee and appropriate board or commission and the name and duration of the naming rights will be approved by the appropriate Department Director.

Other Recognition Opportunities
Other recognition opportunities may be established by any department and approved by the Department Director with donations being approved by the Department Director or Designee. An example of such an opportunity is the athletic division's current t-shirt sponsorship program for youth athletics. The division offers season-long sponsorships, which help fund supplies for youth programs in exchange for recognition on the youth athletic uniforms.

All name submittals will be reviewed against a set of guidelines established by the Naming Committee. This way, the Town can continue to promote its vision even through issuing naming rights and other forms of recognition. Such guidelines include things like not considering companies that receive a majority of their revenues through the sale of alcohol, tobacco, firearms or sexually explicit materials; and names affiliated with religious and political groups will also not be considered. Names should be community and family-friendly and to the best of our ability continue to foster a sense of small town character and history.

The Naming Committee developed a full set of guidelines to assist in reviewing naming and recognition applications. Along with some general provisions for the Town (e.g. the Town retains the right to re-name any facility at any time), the guidelines outlines different types of gifts that can be given:

- Major Gift – is a donation of at least 50% or capital construction costs, all or most of the land for a facility or a significant long-term operational endowment (10 year min).
- Gift – a donation smaller than 50% or capital costs, donation of products or services that aid in the construction of a facility or an operational endowment that lasts less than 10 years.
- Sponsorship – is a donation that will aid in the operation of a program or facility for a short period of time (one year or less).

Naming rights to any facility will only be considered in the case of a major gift. Other recognition opportunities (temporary signs or program advertising) may be available through the other types of giving and will be determined by way of the process outlined in the policy.

Budget Impact

None.

Staff Recommendation

Staff recommends adopting the updated naming policy.

Proposed Motion

"I move to approve Resolution No. 2013 -56: A Resolution Adopting an Amended Town of Castle Rock Facility Naming Policy"

Attachments

Attachment A: Resolution No. 2006-126: A Resolution Adopting A Policy On The Naming Of Town Facilities
Attachment B: Resolution No. 2013-56: A Resolution Adopting an Amended Town of Castle Rock Facility Naming Policy
Attachment C: Naming and Recognition Guidelines

ATTACHMENT A

RESOLUTION NO. 2006 – 126

A RESOLUTION ADOPTING A POLICY ON THE NAMING OF TOWN FACILITIES

WHEREAS, the Castle Rock Town Council desires to adopt a formal policy and procedure for naming new or existing unnamed Town facilities; and

WHEREAS, the overall goal for naming of Town facilities is to continue to foster a sense of community and small town atmosphere; and

WHEREAS, the desired process for naming Town facilities includes opportunity for participation by residents, Boards and Commissions and Town staff with final decisions made by Town Council.

NOW, THEREFORE BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF CASTLE ROCK AS FOLLOWS:

Section 1. Adoption. This resolution shall serve as the Town's policy on naming of Town facilities effective upon adoption by Town Council and remain in force and effect until amended or rescinded (Facility Naming Policy). The Facility Naming Policy shall read as follows:

TOWN OF CASTLE ROCK
FACILITY NAMING POLICY

1.1. Town facilities for purposes of this Facility Naming Policy include, but are not limited to, public buildings, parks, trails, open space and arterial streets.

1.2 The Facility Naming Policy goal in selecting names for Town facilities shall be primarily to advance fostering a sense of community and small town character. This includes names which heighten the awareness of Town history, celebrate the natural environment and call attention to points of pride in our community, to people, events and geography that have shaped the Town, create our sense of place and make our community unique. It is recognized that there will be instances in which names regarding a special tribute, a memorial, a geographic feature or a modern neighborhood name may be appropriate.

1.3. Nominations in general or for a specific facility may be submitted at any time by any person utilizing a form provided by the Town to be generally available in Town facilities, communications and web site. The Town Clerk shall be responsible for receiving and maintaining an inventory of nominations. The Town Council and/or the Town Manager also reserve the right to establish a naming contest for a specific Town facility.

1.4 The Town Manager shall chair a Town Staff committee responsible for establishing and/or prioritizing Town facilities in need of a name, for reviewing nominations received and/or generating new nominations, and for selecting nominations for further consideration and/or recommendation.

1.5. The report of the staff committee on the naming of a Town facility shall first be submitted to the Town Board or Commission most closely involved with the facility to be named. For example, the Parks and Recreation Commission shall review naming reports for parks, recreation, trails and open space facilities; the Utilities Commission for water, sewer and storm water facilities; the Public Works Commission for transportation and street facilities; the Public Safety Commission for police and fire facilities; the Public Art Commission for public art facilities; and the Planning Commission for general government facilities.

1.6. The Board or Commission shall consider the staff report, consider any additional public and Board/ Commission input, and by majority vote make a recommendation to the Town Council for the naming of a particular facility. While the Board/Commission may recommend a name not included in the staff report, the Board/Commission is expected to respect the process established herein and adhere to the policy goal established herein.

1.7. The Board/Commission report and staff report shall then be submitted to the Town Council for final action. Final action of the Town Council shall be in the form of a Resolution establishing the name of the facility and the history, circumstances and reasons for the approved name.

1.8 Following Town Council approval of the name of a facility, Town staff shall be responsible for creating signage, on-site public information, community information and dedication ceremonies as appropriate.

1.9. Naming Rights For Financial Consideration. Reserved.

PASSED, APPROVED AND ADOPTED this 26th day of September, 2006, by the Town Council of the Town of Castle Rock, Colorado, on first and final reading by a vote of 7 for and 0 against.

ATTEST:

Sally A. Misare Town Clerk

TOWN OF CASTLE ROCK

Randy A. Reed, Mayor

Approved as to form:

Robert J. Slentz, Town Attorney

Approved as to content:

Mark Stevens, Town Manager

Name a Town Facility
Nomination Information

The Town of Castle Rock is accepting name nominations for existing and future un-named community assets such as parks, trails, open space, buildings and streets.

Prospective facility names should advance the Town's vision of fostering a sense of community. Name nominations should heighten awareness of Town history, celebrate the natural environment and call attention to points of pride in our community – to the events that have shaped the Town and the people who have helped make Castle Rock the inviting community it is today and will be tomorrow.

Nominations may be general -- applicable to and considered for any unnamed community asset -- or be specific to a particular asset such as a park or street.

The Castle Rock Town Council will make final naming decisions after input and recommendations from Town Boards and Commissions and Town Staff.

An initial round of name recommendations will be forwarded to the Town Council in late summer or early fall.

To suggest a meaningful name for a Town asset, please share the following information:

1. Nomination (suggested name)

_____

2. Is this a general nomination? (Should it be considered for any and all community assets?) Yes No

3. Do you have a specific community asset (park, open space, trail, building, street) in mind for this name? If so, please identify the asset.

4. Please describe how the suggested name meets the nomination criteria outlined above. (Tell us the story behind your recommendation.)

5. If this nomination is specific to an existing or future community asset, please explain why.

Please submit nominations to Sally Misare, Town Clerk, 100 N Wilcox St., Castle Rock, CO, 80104.

TOWN COUNCIL MEMORANDUM

TO: MAYOR AND TOWN COUNCIL MEMBERS

FROM: MARK STEVENS, TOWN MANAGER MS

DATE: SEPTEMBER 13, 2006

RE: PROPOSED RESOLUTION ON NAMING OF TOWN FACILITIES

BACKGROUND

In March, 2006 the Town Council established an interim policy for the naming of Town facilities requiring names to be approved by the Town Council with recommendations forwarded by the Town Manager. The Town Council further requested a formal policy be prepared by Town staff and submitted to the Town Council by September 30, 2006 for Council consideration.

The Town Manager established a staff committee comprised of Fritz Sprague, J.J. McCormack, Sally Misare, Rob Hanna and Lisa Boggie to (a) create and implement a process to solicit an initial round of nominations for naming of Town facilities, (b) develop a proposed policy resolution for Council consideration, and (c) prepare a report with options and recommendations for naming of some park facilities.

The work of this committee has been completed. An initial round of nominations was solicited by July 31 via news releases, web site, The Outlook and the Recreation Guide, among other means. The proposed policy resolution is provided to Council in this report for consideration by the Town Council at its September 26 meeting. A report on potential names for parks being developed/to be developed in Castlewood Ranch (2) and Lanterns is being submitted to the Parks and Recreation Commission for consideration at its September 20 meeting and forwarding of recommendations for Council consideration at the October 10 Council meeting.

SUMMARY OF PROPOSED POLICY RESOLUTION

Attached hereto is the proposed Resolution on Naming of Town Facilities as recommended by the staff committee. Key provisions include:

- Establishment of an overall policy goal for names of Town facilities focused primarily on sense of community and small town character.

- On-going name nomination process with opportunity for facility-specific naming contests.

- Staff committee chaired by the Town Manager to consider nominations and prepare staff reports on proposed names.

- Boards/Commissions to consider staff reports and make naming recommendations to Town Council.

- Town Council to make final naming decisions by Resolution.

The issue of establishing policies for naming rights in return for financial consideration (i.e. an individual, organization or company desiring to make a financial contribution in return for a specific name for a specific facility) has proven more complicated than originally anticipated. Staff continues to work on this issue and will report back with recommendations at a later date. A section of the proposed policy resolution is reserved for future amendment on this issue.

OTHER INFORMATION

Upon Council approval of a policy resolution, work will continue pursuant to the policy on nominations and recommendations for naming of Town facilities. As mentioned above, this process is in progress regarding the naming of several park facilities. The Town Manager will convene the staff committee to work on reports for consideration of naming certain public safety facilities, the new major arterial streets as part of TAP and other Town facilities. Nominations would continue to be accepted. Work will continue on the issue of a policy for naming rights for financial consideration.

RECOMMENDATION

We recommend approval of Resolution 2006 - as presented.

ATTACHMENT C

NAMING AND RECOGNITION GUIDELINES

Each request will be evaluated on its own merits.

The Town reserves the right to rename any Town facility.

All naming rights are issued on a limited time basis. Naming terms will be determined on a case-by-case basis depending on the scope and goals of the project and the size and type of the donation.

Definitions:

Major Element: Any significant facility within the Town of Castle Rock. Examples include but are not limited to buildings, streets, parks or any significant structure (e.g. amphitheater, ball field complex, stand-alone swimming pool) that may or may not reside within a park or other larger facility.

Minor Element: Smaller elements of a facility, park or building. Examples include but are not limited to rooms, individual fields, playgrounds, gymnasiums (anything easily distinguishable that will not create confusion to the public)

Major Gift: A major gift will be considered a donation that significantly impacts the construction or continuing operations/maintenance of a facility. Examples include but are not limited to: 50% or more of the capital costs for construction, donation of all or most of the land for a facility site, significant long-term endowment for continuing operations and/or maintenance of a facility (minimum 10 years).

Gift: A gift will be considered a donation that aids the construction or continuing operations/ maintenance of a facility or programming at that facility. Examples include but are not limited to capital contributions under 50% of the total capital costs, donations of products or services that aid in the construction of the facility, a short-term or small endowment for continuing operations and/or maintenance or programming of a facility.

Sponsorship: A Sponsorship will be considered a donation that aids in the short-term operation of a program, event or facility (one year or less).

Guidelines

General naming considerations

- Historic events, people and places
- Outstanding individuals
- Major Gifts

General re-naming considerations

- Generally not encouraged
- Considered for a Major Gift and/or renovation/expansion or a Major or Minor Element
- Historical names shall be preserved

Donation programs from foundations and fund raising entities

- Fundraising efforts by a non-profit organization for a Town facility should be presented and approved by the Naming Committee before beginning.
- Any recognition opportunities at a Town facility must be approved by the Naming Committee and follow the appropriate procedure as outlined in the Town Facility Naming Policy.

Major Elements

Major Gifts:

- An individual, family, corporation, association or other legally created entity giving a Major Gift to a Major Element may request that the name of that individual, family or entity be associated with the name of the Town Facility which is the subject of the donation.
- Naming Committee will review each application and judge them based on their individual merits.
- The Naming Committee will attempt to select naming options that fit with the Town's Mission and Vision.
- The donor's name is not guaranteed not be the primary name of the facility.
- The Naming Committee will submit a name recommendation to the appropriate department board or commission for review. Then, the board or commission will pass a recommendation along to Town Council for final naming approval.

Gifts:

- Naming of Major Elements in exchange for a Gift will not be considered.
- Recognition programs may be established by a department or supporting foundation to formally recognizing individuals, families or entities giving Gifts. Such programs will be approved by the Naming Committee prior to soliciting Gifts.
- Recognition at the facility is not guaranteed for Gifts.

Sponsorships:

- Sponsorships programs may be established by a department or supporting foundation to formally recognize Sponsorships from individuals or corporations.
- Recognition at the facility is not guaranteed for Sponsorships.

Minor Elements:

Major Gifts:

- Due to the nature of constructing a minor element, they will not be available for Major Gifts. Only Major Elements will be open to Major Gifts.

Gifts:

- Minor Elements of a facility may be available for naming if an operational/ maintenance/ programming Gift is given for a minimum of 5 years.
- Minor Elements of a facility may be available for naming for a certain one-time Gift amount established by the department or supporting foundation and following approval by the Naming Committee.

Sponsorships:

- Sponsorships programs may be established by a department or supporting foundation to formally recognize Sponsorships from individuals or corporations.
- Recognition at the facility is not guaranteed for Sponsorships

Considerations for naming

- Companies, individuals and families giving Major Gifts, Gifts and Sponsorships should:
    - Support the mission of the Town of Castle Rock
    - Provide a positive and desirable image to the community
- Entities that are not eligible for naming privileges include: businesses that get a majority of revenue from alcohol, tobacco, firearms or sexually explicit material; religious or political organizations

Signage allowed

- No specialized signage will be displayed. All signs on Town facilities must meet and not depart from the department's/project's graphic and signage standards.

Major Element
Naming Rights Application

Qualification

Companies or individuals who contribute funding to a project or facility may request naming rights to a major element or facility if the donation makes a significant impact to the capital construction or long-term operation of the element, such as:

- Parks
- Trails
- Open space
- Buildings
- Streets

Prospective Facility Names should:

- Advance fostering a sense of community and small Town character.
- Heighten the awareness of Town history
- Celebrate the natural environment
- Call attention to points of pride in our community:
  - People
  - Events and geography that have shaped the Town
  - Create our sense of place that makes our community unique
  - Special tribute
  - Memorial
  - Geographic feature of a modern neighborhood

Final Decision

The Naming Committee and the appropriate Department Head will forward their recommendation to Town Council for final approval.

Major Element Nomination

Suggested Name: Anderson Blue Zone Pump Station

Nominated by: Castle Rock Water Department

Company or individual who made a significant contribution towards a Major facility element:

Name: Monty Anderson

Company: Castle Rock Water Department

Email: NA Phone: NA

What specific community asset (Park, Trail, Open Space, Building, Street) do you have in mind for this name (existing or future asset)?

The Blue Zone Pump Station located at 1760 Meadows Blvd.

Please describe how the suggested name meets the nomination criteria outlined above. (Tell us the story behind your recommendation.)

In 1996 Monty Anderson was hired by the Town of Castle Rock and continued to work for the town for 27 years. In that time, he served as an Equipment Operator II, Plant Mechanic I and ended his career as a Plant Mechanic II. Monty saw the Town go from a population of 12,494 to 80,637. Along with that, came a tremendous amount of expansion of the water and wastewater facilities and infrastructure of Castle Rock Water (CRW).

Over the many years, Monty helped with everything from the laying of water pipe, repairing mains, fixing pumps, and building industrial electrical control panels for wells, pump stations and lift stations. He not only helped build the infrastructure, but also repaired and maintained it as well, and served as the equipment guru to keep everything running. The Distribution team often looked to him to understand how to maintain and set the 165 or so Pressure Relief Valves (PRVs) located across Town. He was the supreme source for water flow problems and issues in the Distribution system.

Monty was CRW's Lead Industrial electric/electronic expert; he was the expert for all things mechanical and electrical. He built many of the electrical panels used to produce, treat, and distribute water and control wastewater throughout Town. Monty spent much of his time helping other staff understand how the system operated, how to safely make repairs, the importance of what was happening and how it affected downstream infrastructure.

Monty had the genius ability to troubleshoot very complicated processes, develop plans to fix the problem, and to complete the repairs. Following are two great examples of Monty's quick thinking and excellent work.

When the Meadows Water Treatment Plant main power disconnect failed, Monty worked through the night to diagnose the issue. He came up with a way to bypass the failure, bringing the plant temporarily back online. The electrical contractor came out and installed the replacement 480 V switch, a few days later. The Meadows Plant is instrumental in fulfilling production needs during high demand season. His quick thinking and fast work prevented, what could have been a potential restriction on water use, due to reduced treatment capacity. The Meadows plant treats about 5 million gallons per day, which represents almost one quarter of Castle Rock's summer water needs.

Another example of Monty's ingenuity and mechanic ability was the recent discovery of a tear in the liner of the Castle Rock Reservoir #1. The damage was causing erosion in the wall of the reservoir. CRW reached out to the engineering firm that was responsible for making improvements to the pond, for guidance on how to repair the pond lining. The engineering firm could not offer a method for the liner repair. Monty investigated and figured out a way to make repairs and completed them. If the repairs had not been made, the capacity of the reservoir would have been greatly reduced and further erosion would have increased the damage to the liner.

Monty was a shining example of the Town's values. When considering the values and how Monty related to them, staff were able to give several examples of how Monty embodied each and every one. His Commitment to Excellence was noted often. He was very professional, competent, capable, friendly and easy going. He was always willing to help not only teammates, but all staff, residents and customers, as well. He never complained or became upset when asked to help with a difficult task. He was relied on heavily by all for his knowledge and ability to troubleshoot issues and find resolutions.

Monty grew up in Franktown CO, helping on his family's ranch and was always proud of his community and heritage. He was a volunteer for the Douglas County Sheriff's Office and the Franktown Fire Department, for a time. He also spent 20 plus years as a volunteer on the Douglas County Fair board. He supported local youth in both the 4-H and Little Britches programs.

Monty was diagnosed with cancer in 2022 and lost his battle in April 2023. Though he is no longer with us, he has left a small part of himself with each of his teammates and many individuals in the community. The skills and knowledge that he shared are an invaluable asset to CRW and the Town of Castle Rock.

Please explain why this nomination specifically applies to the identified existing or future community asset.

One of the last projects that Monty was a part of, was the recent pump motor starter equipment replacement for the variable frequency drives (VFDs), at the Blue Zone Pump Station. Monty was able to completely rehabilitate the pump motor starter equipment. He gutted the old electrical panels and installed new VFDs. His efforts to update the equipment greatly improved the operation and efficiency of the facility. This is the defining reason that staff are requesting

to rename the Blue Zone Pump Station to the "Anderson Pump Station."

Approvals:

Date of Naming Committee Approval:

Department Head Approval:_____ Date: _____

Date of Town Council meeting to approve Resolution:

Please submit nominations to Lisa Anderson, Town Clerk,
100 N Wilcox St., Castle Rock, CO, 80104, TownClerk@CRgov.com

CASTLE ROCK Qwater
Securing our future drop by drop

0 250 500 1,000 Feet

1 inch = 371 feet

Date: 4/24/2023

Document Path: \\CRSAN1\UTUsers\pthorstenson\Desktop\11x17 LndScp10.6.mxd

Disclaimer: The data presented has been compiled from various sources, each of which introduces varying degrees of inaccuracies or inconsistencies. Such discrepancies in data are inherent and in supplying this product the Town of Castle Rock assumes no liability for it's use or accuracy. Questions or comments regarding the cartographic composition of this map including, but not limited to, errors, omissions, corrections, and/or updates, should be directed to the Utilities Department, Town of Castle Rock, (720) 733-6056. Copyright 2022, Town of Castle Rock Utilities Mapping.

Blue Zone Pump Station

Town of Castle Rock

Agenda Memorandum

Agenda Date: 4/26/2023

Item #: 6. **File #:** WC 2023-044

To: Members of the Castle Rock Water Commission

From: Mark Marlowe, P.E., Director of Castle Rock Water
Nichol Bussey, Business Solutions Manager

Resolution Approving Changes to the Castle Rock Water Grease Interceptor Assistance Program *[Town-wide program]*
Town Council Agenda Date: May 16, 2023

Executive Summary

The purpose of this memorandum is to request Council approval of a Resolution (***Attachment A***) to approve the revised Grease Interceptor Assistance Program offered by Castle Rock Water. Section 13.04 of the Town of Castle Rock Municipal Code requires all connectors to the sewer system to comply with the Code of Rules and Regulations of the Plum Creek Water Reclamation Authority (PCWRA). Grease interceptors are required under PCWRA's rules. The cost to retrofit existing businesses in older buildings with grease interceptors can be costly, placing a burden on small businesses. To this end, in 2021, Castle Rock Water staff developed an assistance program to help mitigate the costs of retrofitting an existing building with a grease interceptor. Castle Rock Water staff is proposing to revise the assistance program to increase the funds available to Castle Rock businesses with total grant opportunities from $7,500 to $15,000 per location and an additional 5-year loan option per location from $7,500 to $20,000 per customer. The total annual budget for this program is proposed to go from $40,000 to $60,000.

Notification and Outreach Efforts

Letters outlining the original grease interceptor assistance program were mailed directly to affected Castle Rock businesses in June and July of 2021. In addition, information about the program has been posted on thecrgov.com/crwatercares <https://crgov.com/2954/Castle-Rock-Water-Cares> web page since June 2021. To date, three local Castle Rock businesses have received funding from the program, and an additional two businesses have been approved for funding but have not yet completed their projects.

If this resolution is approved, staff will mail letters to affected Castle Rock businesses to notify them of the changes to the assistance program. Information on the crgov.com/crwatercares <https://crgov.com/2954/Castle-Rock-Water-Cares> web page will also be updated to reflect the changes.

History of Past Town Council, Boards & Commissions, or Other Discussions

On February 26, 2020, Castle Rock Water Commission recommended approval of a new grease interceptor ordinance, Ordinance 2020-004 to clarify rules regarding Grease Interceptors required through Plum Creek Water Reclamation Authority.

On April 21, 2020, Town Council approved a new grease interceptor ordinance, Ordinance 2020-004 to clarify rules regarding Grease Interceptors required through Plum Creek Water Reclamation Authority.

In June of 2021, CRW Staff identified a grease interceptor assistance program to Council and began to use the program.

Discussion

Outdoor grease interceptors are required for all food service facilities in Castle Rock. The requirements are in the PCWRA Code of Rules and Regulations, and by Town code, sewer service within Castle Rock must be provided in accordance with these regulations. The installation of grease interceptors on existing buildings can be costly, placing a burden on small businesses.

In 2021, Castle Rock Water implemented a grease interceptor assistance program to help defray the costs associated with installing grease interceptors on existing buildings in Castle Rock. This program has provided up to four (4) grants per year up to $7,500 per grant for 50% of the cost and installation of a grease interceptor. This grant could also be supplemented by a loan up to an additional $7,500, for a maximum total town financial assistance of $15,000 or 50% of the cost and installation of the grease interceptor, whichever was less. If used, the loan is paid back on the customer's water bill over five (5) years at an annual percentage rate of 2.54%. Funding of each grant is split between the Town of Castle Rock General Fund for $5,000 and Castle Rock Water for $2,500.

Castle Rock Water is proposing to increase the limits of the assistance to provide up to four (4) grants per year up to $15,000 per grant for 50% of the cost and installation of a grease interceptor. This grant could be supplemented by a loan up to an additional $20,000, for a maximum total town financial assistance of $35,000 or 50% of the cost and installation of the grease interceptor, whichever is less. If taken, the loan will be paid back on the customer's water bill over five (5) years at an annual percentage rate of 2.54%. Funding of the grant would be split between the Town of Castle Rock General Fund for $5,000, and Castle Rock Water for $10,000.

Castle Rock businesses must meet the following criteria to qualify for the assistance program:

1. The property or building where the business is located must be at least 20 years old. Newer buildings have been under the requirement for grease interceptors so property owners had every opportunity and the requirement to install at the time of construction.
2. The business must have a stand-alone physical and publicly accessible location within the Town of Castle Rock and be a Castle Rock Water customer with an active water billing account.
3. The business must be engaged in activities legal under all applicable laws.

4. The business must be registered with the Colorado Secretary of State's Office.

Budget Impact

The current budget includes $40,000 for the assistance program. Castle Rock Water will request a second quarter budget amendment to increase the available funds under GL account 213-4500-445-80-97 for $60,000 to cover up to four grants per year. Castle Rock Water will then fund GL account 213-4500-445-80-97 for $60,000 each year as long as the assistance program is in place. There would be no impact to the Town of Castle Rock General Fund GL account 111-1300-413-80-41 as the funds provided by the General Fund are not changing. Loan funds would be provided from GL account 213-0000-115-25-00 but because this is an accounts receivable account and the loan funds are paid back over time, there is not a budget impact to this account.

Staff Recommendation

Staff recommends Council approval of the Resolution as presented.

Proposed Motion

"I move to recommend to Town Council approval of the Resolution as presented"

Attachments

Attachment A: Resolution (Not Attached)

Town of Castle Rock

Agenda Memorandum

Agenda Date: 4/26/2023

Item #: 7. **File #:** WC 2023-045

To: Members of the Castle Rock Water Commission

From: Mark Marlowe, P.E., Director of Castle Rock Water
Matt Benak, P.E., Water Resources Manager
Lauren Moore, Water Resources Program Analyst

Resolution Approving the 2023 Town of Castle Rock/Sublette Water Lease Agreement *[Rothe/Sublette Recharge Project, Weld County, CO]*
Town Council Agenda Date: May 2, 2023

Executive Summary

Castle Rock Water is seeking Town Council approval of a Resolution (Attachment A) for a water lease with Sublette, Inc. (Sublette). Sublette is interested in leasing a portion of Castle Rock's Recharge Credits associated with the Rothe-Sublette Recharge Project located in eastern Weld County, just north of the South Platte River. Castle Rock is currently leasing 600 acre-feet (AF) of these credits to the Town of Wiggins, Colorado in 2023; however, there are approximately 134 AF of recharge credits that are currently unused. Sublette intends to use a portion of these credits to offset some of their well pumping depletions from crop production.

If Council approves this lease, 134 AF of recharge credits will be leased to Sublette at the rate of $36.50 per AF, which amounts to $4,891 in revenue. This is the current agricultural leasing price that the Town has established with other agricultural entities.

History of Past Town Council, Boards & Commissions, or Other Discussions

On April 28, 2021, Castle Rock Water Commission recommended Town Council approval of the 2021 Spot Water Lease with Sublette, Inc.

On May 4, 2021, Town Council approved the 2021 Spot Water Lease with Sublette, Inc.

On May 25, 2022, Castle Rock Water Commission recommended Town Council approval of the 2022 Spot Water Lease with Sublette, Inc.

On June 7, 2022, Town Council approved the 2022 Spot Water Lease with Sublette, Inc.

Discussion

Castle Rock Water has a strategic goal to strive to maintain sustainable rates and fees, and demonstrate fiscal responsibility, accountability, and transparency. One of the tactics to achieve this goal is to maximize leasing opportunities for idle water rights. Over the past five years, the Town has generated over $1.2 million by leasing idle water rights to downstream users (see **Table 1** below). Until these water rights can be fully utilized by the Town, staff will continue to seek out users that can put these rights to beneficial use.

Table 1. Revenue generated from leasing idle water rights to downstream users over the past five years.

2018	2019	2020	2021	2022
$29,019.13	$30,606.65	$70,699.75	$499,449.73	$531,292.81

The general concept of the Rothe-Sublette Recharge Project is that water can be diverted from the South Platte River at the Riverside Canal, which is located east of Greeley under a water right with an effective 1988 priority date. This water is delivered from the Riverside Canal into several recharge ponds which then makes its way through the alluvial sands as groundwater return flow to the South Platte River. The hydrogeologic transport of this water through the alluvium takes a number of years. The decree in Colorado Water Court Case No. 89CW027 defines the terms and conditions for operation of this project, including the specific timing of the recharge credits.

The Town's portion of the project includes up to the first 770 acre-feet per year of recharge credits. The Town is currently leasing 600 AF to the Town of Wiggins for the augmentation of several municipal supply wells. Approximately 134 AF of additional recharge credits are available for use in 2023 and a partner in the Rothe-Sublette Recharge Project (Sublette, Inc.) has expressed interest in leasing these excess credits for 2023.

Budget Impact

If Council approves the agreement, Castle Rock Water would receive $4,891 in additional revenue in 2023 from Sublette. The revenue will be deposited into the Water Resources Fund Capital Leases account 211-4375-393.70-00.

Proposed Motion

"I move to recommend to Town Council approval of the Resolution as presented"

Attachments

Attachment A: Resolution (Not Attached)
Exhibit 1: Agreement

TOWN OF CASTLE ROCK AND SUBLETTE, INC.
2023 WATER LEASE AGREEMENT

THIS WATER LEASE AGREEMENT ("Agreement") is entered into _____, 2023, by and between the Town of Castle Rock, a home rule municipal corporation, acting by and through the Town the Castle Rock Water Enterprise ("Town"), as Lessor, whose address is 100 N. Wilcox Street, Castle Rock, Colorado 80104 and Sublette, Inc. ("Sublette"), as Lessee, whose address is PO Box 21, Orchard, Colorado 80649, collectively referred to as the Parties.

RECITALS

WHEREAS, pursuant to Case No. 89CW27, the Town and other owners operate the Rothe-Sublette Recharge Project ("Project"), which diverts water from the South Platte River at the Riverside Canal into recharge ponds that accrete water to the South Platte River to generate recharge credits ("Recharge Credits"); and

WHEREAS, the Town owns 60.4 percent of the first 1,275 acre-feet (AF), up to 770 AF annually, of recharge credits decreed in Case No. 89CW27, District Court, Water Division No. 1, ("Town Recharge Credits"); and

WHEREAS, the Town is currently leasing 600 AF of Town Recharge Credits to the Town of Wiggins for augmentation of Wiggins' tributary well pumping pursuant to Case No. 11CW131; and

WHEREAS, Case No. 89CW27 authorizes the lease of excess Recharge Credits to other parties; and

WHEREAS, Sublette seeks to lease from the Town excess Town Recharge Credits.

AGREEMENT

NOW THEREFORE, in consideration of the mutual agreements contained herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Town and Sublette agree as follows:

1. Lease Credits and Price. The Town hereby leases to Sublette one hundred and thirty-four (134) AF in excess Town Recharge Credits in 2023 ("Leased Credits"). Sublette shall pay to the Town four thousand eight hundred and ninety-one dollars ($4,891), which is thirty-six dollars and fifty cents ($36.50) per AF of Leased Credits. Sublette's lease payment shall be due thirty (30) days following the execution of this Agreement.

2. Lease Term. The term of this Agreement shall commence upon its execution and expire December 31, 2023. By mutual written agreement of the Parties, this Agreement may be renewed on the same or on different terms.

3. Sublette's Obligations. It shall be the responsibility of Sublette to obtain any approvals necessary to use the Leased Credits for Sublette's intended purposes, and the Town makes no warranties or guarantees that such approvals can be obtained. Sublette shall provide the Town with accounting showing the monthly volume of the Leased Credits actually used by Sublette.

4. Town's Obligations. The Town shall make the Leased Credits available to Sublette on an "as is" basis.

5. Notice. All notices which may be required to be given by either Party to the other shall be made in writing and either hand delivered or sent by first class United States mail, postage prepaid, addressed as follows, or via email:

If to Town:	Town of Castle Rock (Castle Rock Water) Attn: Water Resources Manager (Matt Benak) mbenak@crgov.com 175 Kellogg Court Castle Rock, CO 80109
with copy to:	Town of Castle Rock Attn: Town Attorney (Mike Hyman) mhyman@crgov.com 100 N. Wilcox Street Castle Rock, CO 80104
If to Sublette:	Sublette, Inc. Attn: Manager (Sheldon Skovgaard) drylakesranch@gmail.com PO Box 21 Orchard, CO 80649

6. Entire Agreement. This Agreement represents the entire Agreement between the Parties on the matters set forth herein and supersedes all prior negotiations, representations or agreements respecting said matters whether written or oral.

7. Binding Effect. The execution of the Agreement by the Town as Lessor and Sublette as Lessee constitutes the execution of a binding lease agreement by the Parties on the terms and conditions contained herein and may not be modified except in writing signed by both Parties. This Agreement shall be binding on the Parties' respective successors and assigns.

8. Enforcement. In the event either Party commences any action to enforce the terms and provisions of this Agreement, the prevailing Party shall be entitled to its reasonable attorneys' fees and all costs incurred in connection with such action, including, but not limited to, expert witness fees.

9. Controlling Law. This Agreement shall be governed under, and construed pursuant to the laws of the State of Colorado.

(signature page to follow)

LESSOR:

ATTEST:

TOWN OF CASTLE ROCK

_____
Lisa Anderson, Town Clerk

_____
Jason Gray, Mayor

Approved as to form:

Approved as to content:

_____
Michael J. Hyman, Town Attorney

_____
Mark Marlowe, Director Castle Rock Water

LESSEE:

Sublette, Inc.

By: _____

Its: _____

STATE OF COLORADO)

) *ss.*

COUNTY OF WELD)

The foregoing instrument as acknowledged before me this ___day of _____, 2023 by _____as _____of the Sublette, Inc.

Witness my official hand and seal.
My commission expires:

_____
Notary Public

Town of Castle Rock

Agenda Memorandum

Agenda Date: 4/26/2023

Item #: 8. **File #:** WC 2023-046

To: Members of the Castle Rock Water Commission

From: Mark Marlowe, P.E., Director of Castle Rock Water
Matt Benak, P.E., Water Resources Manager
Lauren Moore, Water Resources Project Manager

Resolution Approving the 2023 town of Castle Rock/Colorado Parks & Wildlife Spot Water Lease Agreement *[Chatfield Reservoir, Douglas County]*
Town Council Agenda Date: May 2, 2023

Executive Summary

Castle Rock Water is seeking Town Council approval of a resolution (***Attachment A***) for a spot water lease with Colorado Parks & Wildlife (CPW). While the Town currently owns 719 acre-feet (AF) of storage in Chatfield, the Colorado Water Conservation Board (CWCB) allows for rental of the remaining permitted amount, for a total of 2,000 AF of storage. The Town currently has upwards of 430 AF of water stored in the reservoir with additional reusable supplies coming in each day. In anticipation of drought conditions this summer, CPW wishes to lease some of the Town's surplus water stored in Chatfield Reservoir to fill the hatchery settling ponds as well as the Dog Off Leash Area ponds located within Chatfield's recreation area.

Under this agreement, up to 200 AF of water will be released from the Town's Chatfield Reservoir storage account directly into the fish hatchery pond gate and/or a book over to CWP's Chatfield Storage will occur. This release would occur between May 3 and December 31, 2023. The Town will assess a $385 per AF price for the water, with payment due upon total quantity released. The potential revenue for this lease is up to $77,000. The agreement will terminate at the end of 2023.

History of Past Town Council, Boards & Commissions, or Other Discussions

Castle Rock Water Commission will be informed of the project at their March 28, 2021 meeting.

On April 6, 2021 Town Council approved a spot water lease with CPW.

Discussion

Castle Rock Water has a strategic goal to strive to maintain sustainable rates and fees, and demonstrate fiscal responsibility, accountability, and transparency. One of the tactics to achieve this goal is to maximize leasing opportunities for idle water rights. Over the past five years, the Town has

generated over $1.2 million by leasing idle water rights to downstream users (see **Table 1** below). Until these water rights can be fully utilized by the Town, Staff will continue to seek out users that can put these rights to beneficial use.

Table 1. Revenue generated from leasing idle water rights to downstream users over the past five years.

2018	2019	2020	2021	2022
$29,019.13	$30,606.65	$70,699.75	$499,449.73	$531,292.81

The Town currently owns 719 AF of storage space in Chatfield Reservoir and plans to eventually reach 2,000 AF of storage by 2031. As part of the option agreement the Town has with CWCB, the Town will purchase blocks of storage over the next 10 years. The Town recently purchased 129 AF in 2022, bringing the Town's total storage to 719 AF. The Town has one deferral year remaining until the full storage space is realized within the 10-year period.

The Town has been able to store excess supplies in Chatfield Reservoir over the past year, which have exceeded the purchased storage amounts (719 AF). Since the Town does not physically have a way to utilize these excess storage supplies at this point in time, CWCB has developed, and Town Council has approved, a lease agreement with the Town to lease the optioned storage space. With a current annual lease rate of $50/AF for 1,281 AF (2,000 AF minus 719 AF), the Town will pay the State $64,050 in 2023.

This spot lease with CPW will allow the Town to further maximize storage space within the reservoir and in addition to other similar leases, will help to cover the annual lease option of storage space with CWCB.

Budget Impact

Castle Rock Water will receive up to $77,000 of additional revenue in 2023 through this agreement. The revenue will be deposited into the Water Resources Fund Capital Leases account 211-4375-393.70-00.

Proposed Motion

"I move to recommend to Town Council approval of _____ as presented"

Attachments

Attachment A: Resolution (Not Attached)
Exhibit 1: Agreement

TOWN OF CASTLE ROCK/COLORADO PARKS AND WILDLIFE WATER LEASE AGREEMENT

THIS WATER LEASE AGREEMENT ("Agreement") is entered into _____, 2023, by and between the Town of Castle Rock, a home rule municipal corporation, acting by and through the Town the Castle Rock Water Enterprise ("Town"), as Lessor, whose address is 100 N. Wilcox Street, Castle Rock, Colorado 80104 and the Colorado Parks and Wildlife ("CPW"), as Lessee, whose address is: 6060 Broadway, Denver, Colorado 80216, collectively referred to as the Parties.

RECITALS

WHEREAS, the Town owns certain water in the Chatfield Basin that is reusable and fully consumable after its first use for municipal purposes by the Town. From time to time, a certain amount of this water is surplus to the needs and obligations of the Town ("Surplus Water"); and

WHEREAS, the Town anticipates it will have Surplus Water available from time to time in 2023; and

WHEREAS, CPW desires to lease a certain portion of the Surplus Water from the Town in accordance with the terms and conditions of this Agreement for use as a supplemental supply for recreational and piscatorial use at Chatfield State Park and Cherry Creek State Park or other CPW facilities to be released from Chatfield Reservoir through the outlet manifold and Chatfield State Fish Unit.

AGREEMENT

NOW THEREFORE, in consideration of the mutual agreements contained herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Town and CPW agree as follows:

1. Water Rights Lease. The Town hereby leases to CPW up to 200 acre-feet (AF) of the Surplus Water ("Leased Water"), which will be made available as follows:

   A. Between May 3, 2023 and December 31, 2023 with no additional water released thereafter.

2. Deliveries.

   A. Amount. The Town may have water available within its Chatfield Storage Account to lease up to 200 AF to CWP in 2023. If Surplus Water is available, at the discretion of the Town, the Leased Spot Water will be withdrawn from the Town's Storage Account upon coordination with the Colorado Department of Natural Resources – Division of Water Resources, who will make the requested release from Chatfield.

B. Location. Release from Chatfield Reservoir to the reservoir outlet manifold and through the Chatfield State Fish Unit and adjacent settling ponds; Release may also consist of a book-over from Castle Rock's Chatfield Storage Account into CWP's Chatfield Storage Account.

C. Accounting. CPW must provide the Town with a copy of the water accounting showing the date(s) and quantities of the release. This information will also be used to confirm and update the Town's Chatfield accounting forms.

3. Lease Rate. Leased quantities shall be paid at the rate of $385 per acre-foot. Payment for quantities leased shall be made thirty (30) days following the issuance of an invoice from Castle Rock. The Town shall invoice CWP and payment shall be remitted to Castle Rock Water; 175 Kellogg Court; Castle Rock, CO 80129; ATTN: Matt Benak, Water Resources Manager.

4. Quality of Leased Water. Leased Water shall be delivered "as is," but shall be of a quality that meets all standards and effluent limitations specified in Colorado Discharge Permit System Permit No. CO-0038547, as amended, or in any other discharge permit issued by the Water Quality Control Division or by the U.S. EPA authorizing discharges from the Plum Creek Water Reclamation Authority facility, such quality to be measured at the authorized discharge point(s) specified in any such discharge permit. By entering into this Agreement and utilization of the Leased Water, CPW acknowledges that water meeting the requirements of this paragraph is suitable for its purposes and will accept such water as meeting the terms of this Agreement.

5. Lease Term. The term of this Agreement shall commence upon its execution and expire December 31, 2023. By mutual written agreement of the Parties, this Lease Agreement may be renewed on the same or on different terms.

6. Lessee's Obligations. CPW's obligations under this Agreement are limited to making the payments as described in paragraph 3 above.

7. Notice. All notices which may be required to be given by either Party to the other shall be made in writing and either hand delivered or sent by first class United States mail, postage prepaid, addressed as follows, or by facsimile, or via electronic means:

If to Town:	Town of Castle Rock (Castle Rock Water) Attn: Water Resources Manager (Matt Benak) 175 Kellogg Court Castle Rock, CO 80109
with copy to:	Town of Castle Rock Attn: Town Attorney (Mike Hyman) 100 N. Wilcox Street Castle Rock, CO 80104
If to the State:	Colorado Parks and Wildlife Attn: Water Resources Engineer (Jon Erickson)

6060 Broadway
Jon.Erickson@state.co.us
With cc: Donald.Baggus@state.co.us

8. Assignment. Lessee may not assign its rights hereunder without the prior written consent of Lessor, which may be withheld in Lessor's sole discretion. In the event that Lessor consents to an assignment of Lessee's rights hereunder, the assignee shall execute an assumption agreement pursuant to which it shall assume Lessee's obligations hereunder. The terms of such assumption agreement must be approved by Lessor.

9. Entire Agreement. This Agreement represents the entire Agreement between the Parties on the matters set forth herein and supersedes all prior negotiations, representations or agreements respecting said matters whether written or oral.

10. Binding Effect. The execution of the Agreement by the Town as lessor and CPW as lessee constitutes the execution of a binding lease agreement by the Parties on the terms and conditions contained herein and may not be modified except in writing signed by both Parties. This Lease shall be binding on the Parties' respective successors and assigns.

11. Controlling Law. This Lease Agreement shall be governed under, and construed pursuant to the laws of the State of Colorado.

(signature page to follow)

LESSOR:

ATTEST: **TOWN OF CASTLE ROCK**

_____ _____
Lisa Anderson, Town Clerk Jason Gray, Mayor

Approved as to form: **Approved as to content:**

_____ _____
Michael J. Hyman, Town Attorney Mark Marlowe, Dir. of Castle Rock Water

STATE OF COLORADO)
) *ss.*
COUNTY OF DOUGLAS)

The foregoing instrument as acknowledged before me this __ day of _____, 2023 by Lisa Anderson as Town Clerk and Jason Gray as Mayor of the Town of Castle Rock, Colorado.

Witness my official hand and seal.
My commission expires:

_____
Notary Public

LESSEE:

Colorado Parks and Wildlife

By: _____
Kris Wahlers, Chatfield State Park Manager

STATE OF COLORADO)
) *ss.*
COUNTY OF DOUGLAS)

The foregoing instrument as acknowledged before me this __ day of _____, 2023 by _____ as _____ of the State of Colorado.

Witness my official hand and seal.
My commission expires:

_____
Notary Public

Town of Castle Rock

Agenda Memorandum

Agenda Date: 4/26/2023

Item #: 9. **File #:** WC 2023-047

To: Members of the Castle Rock Water Commission

From: Mark Marlowe, P.E., Director of Castle Rock Water
Nichol Bussey, Business Solutions Manager
Paul Rementer, Enterprise Fund Analyst

Update on Customer Characteristics
Town Council Agenda Date: NA

Executive Summary

This will be a presentation item only.

Town of Castle Rock

Agenda Memorandum

Agenda Date: 4/26/2023

Item #: 10. **File #:** WC 2023-048

To: Members of the Castle Rock Water Commission

From: Mark Marlowe, P.E., Director of Castle Rock Water

An Informational Item Pertaining to the Proposed Senate Bill SB23-267 Concerning Protecting Water Quality in Chatfield Reservoir and the Watershed
Town Council Agenda Date: April 18, 2023

Executive Summary

Attached is a copy of the Council Packet for the above referenced project for your information.

Attachments

Attachment A: Info on Proposed Senate Bill SB23-267

STAFF REPORT

To: Honorable Mayor and Members of Town Council

Through: David L. Corliss, Town Manager

From: Mark Marlowe, P.E., Director of Castle Rock Water
J. David Van Dellen, P.E., Assistant Director

Title: **Informational Item Pertaining to the Proposed Senate Bill SB23-267 Concerning Protecting Water Quality in Chatfield Reservoir and the Watershed**

Executive Summary

In November 2022, the Chatfield Watershed Authority contracted with lobbyists Steve Balcerovich and Amy Attwood (Lobbyists) to identify a funding source and introduce a fee bill during the 2023 Colorado Legislative Session to address a $1.2 million shortfall over the next five years in Authority funding needed to address water quality issues at the reservoir and within the watershed. The Lobbyists worked with the Authority to identify that a water quality fee which mimics that which is applied through state statute at Cherry Creek State Park would cover the funding shortfall needed over the five-year term. A late bill was authorized and introduced on the senate floor on April 4, 2023 (***Attachment A***) proposing the water quality fee to be paid by visitors of Chatfield State Park in the amount of $1 per vehicle per day or $3 per annual pass, collected by Colorado Parks and Wildlife and distributed to the Authority on a quarterly basis. The proposed bill is anticipated to generate approximately $250,000 annually and includes a repeal date of January 1, 2029 on the basis of the currently justified needs of the Authority.

The bill would allow for the Authority to apply funds from the water quality fee toward nutrient and nonpoint source pollution controls, construct, operate and maintain nonpoint source projects and enhanced water quality monitoring, stormwater runoff mitigation and erosion control within the Chatfield Watershed.

The Authority currently relies exclusively on voluntary member dues and has an annual budget of approximately $200,000 to cover basic responsibilities according to Water Quality Control Regulation No. 73 including water quality monitoring, annual reporting of water quality compliance with the nutrient and chlorophyll-a standards and baseline modeling efforts. The Authority is charged with implementing nonpoint source pollution controls within the Watershed and implementing a Total Maximum Annual Load (TMAL) for phosphorus according to the

Control Regulation. The proposed funding source will allow for the Authority to begin addressing these issues in partnership with member entities.

A factsheet has been developed for this proposed fee bill and is included as Attachment B for reference.

On April 12th, 2023, the Agriculture and Water Resources Committee (Committee) heard the bill and voted to support the bill out of committee 4-3. They then referred the bill to the Finance Committee. Castle Rock is working with the Chatfield Watershed Authority on a white paper to answer some additional questions from the Committee. Douglas County, Jefferson County, Roxborough Water, Colorado Agricultural Leadership Foundation, and Castle Rock Water spoke in favor of the bill. Colorado Water Congress and South Metro Water Supply Authority are also supporting the bill.

Attachments

Attachment A: Draft Water Quality Fee Bill SB23-267
Attachment B: Factsheet

First Regular Session
Seventy-fourth General Assembly
STATE OF COLORADO

INTRODUCED

LLS NO. 23-0994.01 Richard Sweetman x4333 **SENATE BILL 23-267**

SENATE SPONSORSHIP

Van Winkle and Cutter,

HOUSE SPONSORSHIP

Titone and Bradley,

Senate Committees
Agriculture & Natural Resources

House Committees

A BILL FOR AN ACT

CONCERNING A WATER QUALITY FEE TO BE PAID FOR ADMISSION TO CHATFIELD STATE PARK, AND, IN CONNECTION THEREWITH, REQUIRING THE DIVISION OF PARKS AND WILDLIFE TO COLLECT THE FEE AND TRANSFER THE AMOUNT OF THE FEE TO THE CHATFIELD WATERSHED AUTHORITY.

Bill Summary

(Note: This summary applies to this bill as introduced and does not reflect any amendments that may be subsequently adopted. If this bill passes third reading in the house of introduction, a bill summary that applies to the reengrossed version of this bill will be available at http://leg.colorado.gov.)

The bill requires the division of parks and wildlife (division) to require each visitor to Chatfield state park to pay, in addition to any other

fee that the division charges for admission to the park, a water quality fee in the following amount:

- For a person who pays the daily fee to enter the park, the amount of the water quality fee is $1, to be paid for each visit; and
- For a person who uses an annual parks pass or a keep Colorado wild pass to enter the park, the amount of the water quality fee is $3, to be paid once annually.

Beginning April 1, 2024, and every 3 months thereafter, the division shall pay the total amount of money collected during the preceding 3 months as water quality fees to the Chatfield watershed authority (authority); except that the division may retain up to 3% of the money to pay the division's administrative expenses. The authority is required to expend the money to provide for a regional, coordinated approach to phosphorous and other nonpoint source pollution control in the Chatfield watershed, including providing for the construction, operation, and maintenance of nonpoint source projects, water quality monitoring, and urban runoff and erosion management and control.

The water quality fee and associated requirements are repealed, effective January 1, 2029.

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. Legislative declaration. (1) The general assembly finds that:

(a) Chatfield state park is situated in the lower foothills of the front range on the southwestern edge of Denver, and Chatfield reservoir, located in Chatfield state park, is a 1,400 surface acre water body at the confluence of Plum creek and the South Platte river;

(b) Chatfield reservoir was constructed in 1970 for the purpose of providing regional flood control for the Denver metropolitan area and is a regional water supply source for multiple local and regional water producers;

(c) Chatfield state park is one of the most popular recreation areas in the Denver metropolitan region and in all of Colorado and offers numerous recreational activities, including swimming, boating,

paddleboarding, fishing, wildlife viewing, biking, camping, and horseback riding;

(d) The Chatfield watershed authority (authority) was established in 1984 when the governor designated the authority as a 208 management agency, in accordance with section 208 of the "Federal Water Pollution Control Act", also known as the federal "Clean Water Act", 33 U.S.C. sec. 1251 et seq.;

(e) The authority includes Jefferson county, Douglas county, the town of Castle Rock, the city of Littleton, the town of Larkspur, and water and wastewater providers in the Chatfield watershed;

(f) The authority's mission is to promote protection of water quality in the Chatfield watershed for drinking water supplies, recreation, fisheries, and other beneficial uses;

(g) The authority preserves these beneficial uses in Chatfield reservoir and in the watershed through the promotion of point source, nonpoint source, and storm water controls;

(h) Under regulation 73 of the water quality control commission, the authority is required to limit the total maximum annual load of total phosphorus entering the Chatfield reservoir;

(i) The authority continues to implement regulation 73 and coordinate with state and federal agencies regarding water quality control measures;

(j) The authority is also required to maintain compliance with chlorophyll-a and phosphorous standards imposed by regulation 38 of the water quality control commission;

(k) Since 1984, the authority and its members have monitored water quality in the Chatfield reservoir and upstream in the Chatfield

watershed and have undertaken measures to protect water quality in the watershed through voluntary funding contributions and grants;

(l) The Chatfield watershed plan identifies opportunities within the watershed to address the chemical, physical, and biological pollutants that impact the watershed, including controlling runoff from wildfire burn areas, reducing phosphorus quantities by stabilizing degraded streambanks, mitigating runoff from agricultural lands, minimizing leachate from septic systems, and providing public education for reducing contamination from the actions of people;

(m) The effects of increased floods and wildfires threaten to increase pollutant loadings to Chatfield reservoir; and

(n) The authority is unable to qualify for grant programs, which typically require a certain level of matching funds.

(2) The general assembly declares that it is in the best interests of the state to:

(a) Create a water quality fee to be imposed with the entrance fee that visitors pay to visit Chatfield state park;

(b) Require the division of parks and wildlife to collect the water quality fee and pay the amounts collected as water quality fees to the authority; and

(c) Require the authority to expend the money to provide for a regional, coordinated approach to phosphorous and other nonpoint source pollution control in the Chatfield watershed, including providing for the construction, operation, and maintenance of nonpoint source projects, water quality monitoring, and urban runoff and erosion management and control.

SECTION 2. In Colorado Revised Statutes, **add** 33-9-114 as

follows:

33-9-114. Chatfield state park - water quality fee - Chatfield watershed authority - definition - repeal. (1) AS USED IN THIS SECTION, "CHATFIELD WATERSHED AUTHORITY", OR "AUTHORITY", MEANS THE CHATFIELD WATERSHED AUTHORITY ESTABLISHED BY AN INTERGOVERNMENTAL AGREEMENT EXECUTED PURSUANT TO SECTIONS 29-1-203 AND 29-1-204.2 AND INCLUDING THE FOLLOWING MEMBERS:

(a) JEFFERSON COUNTY;

(b) DOUGLAS COUNTY;

(c) THE CITY OF LITTLETON;

(d) THE TOWN OF CASTLE ROCK;

(e) THE TOWN OF LARKSPUR;

(f) CASTLE PINES METROPOLITAN DISTRICT;

(g) CENTENNNIAL WATER AND SANITATION DISTRICT;

(h) DOMINION WATER AND SANITATION DISTRICT;

(i) LOUVIERS WATER AND SANITATION DISTRICT;

(j) PERRY PARK WATER AND SANITATION DISTRICT;

(k) ROXBOROUGH WATER AND SANITATION DISTRICT;

(l) THE CITY AND COUNTY OF DENVER, ACTING BY AND THROUGH ITS BOARD OF WATER COMMISSIONERS; AND

(m) THE PLUM CREEK WATER RECLAMATION AUTHORITY.

(2) ON AND AFTER JANUARY 1, 2024, IN ADDITION TO ANY OTHER FEE THAT THE DIVISION MAY CHARGE VISITORS FOR ADMISSION TO CHATFIELD STATE PARK, THE DIVISION SHALL REQUIRE EACH VISITOR TO PAY A WATER QUALITY FEE IN THE FOLLOWING AMOUNT:

(a) FOR A PERSON WHO PAYS THE DAILY FEE TO ENTER THE PARK, THE AMOUNT OF THE WATER QUALITY FEE IS ONE DOLLAR, TO BE PAID FOR

EACH VISIT; AND

(b) FOR A PERSON WHO USES AN ANNUAL PARKS PASS OR A KEEP COLORADO WILD PASS, AS DESCRIBED IN SECTION 33-12-108, TO ENTER THE PARK, THE AMOUNT OF THE WATER QUALITY FEE IS THREE DOLLARS, TO BE PAID ONCE ANNUALLY.

(3) BEGINNING APRIL 1, 2024, AND EVERY THREE MONTHS THEREAFTER, THE DIVISION SHALL PAY THE TOTAL AMOUNT OF MONEY COLLECTED DURING THE PRECEDING THREE MONTHS AS WATER QUALITY FEES PURSUANT TO SUBSECTION (2) OF THIS SECTION TO THE CHATFIELD WATERSHED AUTHORITY; EXCEPT THAT THE DIVISION MAY RETAIN UP TO THREE PERCENT OF THE MONEY TO PAY THE DIVISION'S ADMINISTRATIVE EXPENSES.

(4) THE AUTHORITY SHALL EXPEND THE MONEY RECEIVED PURSUANT TO SUBSECTION (3) OF THIS SECTION TO PROVIDE FOR A REGIONAL, COORDINATED APPROACH TO PHOSPHOROUS AND OTHER NONPOINT SOURCE POLLUTION CONTROL IN THE CHATFIELD WATERSHED, INCLUDING PROVIDING FOR THE CONSTRUCTION, OPERATION, AND MAINTENANCE OF NONPOINT SOURCE PROJECTS, WATER QUALITY MONITORING, AND URBAN RUNOFF AND EROSION MANAGEMENT AND CONTROL.

(5) THIS SECTION IS REPEALED, EFFECTIVE JANUARY 1, 2029.

SECTION 3. Act subject to petition - effective date. This act takes effect at 12:01 a.m. on the day following the expiration of the ninety-day period after final adjournment of the general assembly; except that, if a referendum petition is filed pursuant to section 1 (3) of article V of the state constitution against this act or an item, section, or part of this act within such period, then the act, item, section, or part will not take

effect unless approved by the people at the general election to be held in November 2024 and, in such case, will take effect on the date of the official declaration of the vote thereon by the governor.

Please Support SB23-267

Concerning Protecting Water Quality in Chatfield Reservoir & Watershed

Senators Lisa Cutter & Kevin Van Winkle

BACKGROUND

*Chatfield Reservoir is a 1,400-acre reservoir in Chatfield State Park and the third most intensely utilized State Park in Colorado, with over **two-million visitors** annually. The reservoir offers public swimming, boating, camping, paddleboarding, fishing, wildlife viewing, biking, camping, horseback riding, and other recreational opportunities. Most importantly, Chatfield Reservoir is an essential water-storage facility for water providers throughout the metro region.*

To protect and improve water quality in Chatfield Reservoir & Watershed, in accordance with Section 208 of the "Federal Water Pollution Control Act," Governor Roy Romer designated The Chatfield Watershed Authority (Authority) as a 208-management agency in 1984. To date, the Authority relies on voluntary dues from local governments and water and wastewater providers (Authority members) to:

- *Monitor water quality.*
- *Perform watershed modeling.*
- *Execute 208 management activities.*
- *Fund non-point source projects and protections.*
- *Prepare water quality reports for the Colorado Water Quality Control Commission.*

The Authority has identified $1.2 million in essential funding needs over the next five years for regionally coordinated water-quality planning and implementation, including:

- *Phosphorous and nonpoint source pollution control in the Chatfield watershed.*
- *Construct, operate, and maintain nonpoint source projects.*
- *Enhanced water quality monitoring, stormwater runoff mitigation, and erosion control.*

To help pay for essential water quality projects, SB23-267 establishes a user fee for Chatfield Park visitors. The proposed user-fee structure is intended to distribute water-quality-protection costs more fairly between Authority members and Chatfield Reservoir users.

- ✓ ***The proposed user fee is a flat $1.00 per one-day admission and $3.00 per annual pass.***
- ✓ ***The user fee would sunset on January 1, 2029.***
- ✓ ***The funding is identical to the water-quality fee visitors pay at Cherry Creek State Park.***

For more info, please contact Steve Balcerovich at 720-351-2007 and/or Amy Attwood at 720-840-4912.

WORKING DRAFT

Town of Castle Rock

Agenda Memorandum

Agenda Date: 4/26/2023

Item #: 11. **File #:** WC 2023-050

To: Members of the Castle Rock Water Commission

From: Mark Marlowe, P.E., Director of Castle Rock Water

Update on Drought Conditions
Town Council Agenda Date: May 2, 2023

Executive Summary

This will be a presentation item only.

Town of Castle Rock

Agenda Memorandum

Agenda Date: 4/26/2023

Item #: 12. **File #:** WC 2023-049

To: Members of the Castle Rock Water Commission

From: Mark Marlowe, P.E., Director of Castle Rock Water

Upcoming Town Council Items
Town Council Agenda Date: NA

Executive Summary

This item is an informational update only, and is designed to give Commission a preview of time critical items that may need to go to Council prior to review at a Commission Meeting.

Items for this month include:

Resolution Approving the Alternate Board Member for the Cherry Creek Project Water Authority