



**EL DORADO CITY COMMISSION - WORK SESSION AGENDA  
CITY HALL – 220 E. FIRST AVENUE  
June 10, 2026 - 5:00 PM**

**Work Session Discussion Items:**

- a. Social Media for Local Officials
- b. Code of Ethics
- c. NE Pressure Zone Study

**Regular Agenda Preview:**

- a. Items to be Placed on the Consent Agenda
  - i. Meeting Minutes
- b. Items to be Placed on the Regular Agenda

**Reports:**

- a. City Commission Reports
- b. City Manager Report



## **A Conversation About Social Media for Local Leaders**

## Why Local Governments Use Social Media

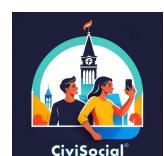
You've probably noticed that many of the places people once turned to for local information have changed. Local newspapers have closed or reduced coverage. Local radio and television no longer cover day-to-day local issues the way they once did. For better or worse, social media has stepped in to fill part of that void as we transition from one medium to another.

Today, social media helps local governments keep residents informed and connected. It can share service alerts, promote community events, recruit new employees, remind residents about programs and benefits, explain policy decisions, support economic development, and highlight the work happening across the organization.

It also provides something communities have always needed: a way for residents to see what their local government is doing and to share what matters to them.

When used well, social media can strengthen communication between local government and the people it serves. But as these platforms have grown, they have also created new challenges that many local leaders are still learning to navigate.

The following pages are designed to guide a conversation about those challenges. How can we approach social media in a way that supports effective leadership and strong communities?



## Your Goals

Which of the following do you believe should be the goals of our social media?

- Explaining policy decisions and the work of our elected officials
- Keeping residents informed about services, programs, and community events
- Providing emergency alerts and important service updates
- Listening to community concerns and feedback
- Promoting the community and supporting economic development
- Helping residents understand the work their government does and the people behind it
- Recruiting new employees and building interest in public service
- Other: \_\_\_\_\_

How important is effective social media to you in achieving these goals?

- Mission Critical
- Important
- Moderately Important
- Not a Priority



## The Reality Of Social Media

Social media platforms operate in a very different environment from traditional public engagement. Understanding these dynamics can help local leaders respond thoughtfully rather than react to the loudest voices online.

Some key realities of social media include:

- Attention drives visibility. Posts that trigger strong reactions (outrage, conflict, or highly relatable content like cute animals) are more likely to spread widely.
- Every post (initially) carries the same weight. Unlike traditional media, social platforms have no editors or gatekeepers. A rumor, opinion, or fact can appear equally credible.
- Most people watch but rarely post. Studies consistently show that the majority of social media users simply observe rather than comment or create posts.
- The instinct to respond is real. Elected officials and staff alike often feel pressure to address visible criticism quickly.
- The attention economy favors people over institutions. Social media users tend to embrace authentic content from individuals and creators more than crafted messaging from organizations.
- Trust in the messenger often outweighs the message itself. People are more likely to believe information shared by someone they know or follow, even when the information is incomplete or incorrect.

## The STPs: The Same Ten People

Let's start with a thought experiment.

Imagine our community is about to get a Costco.

For most residents, this is good news. Affordable groceries. Good paying new jobs. A reason to stay local instead of driving to the next town over, and the tax revenue that comes with it supporting our local services. If you asked almost any family in our community, they'd probably say: great, when does it open?

Now think about what happens on social media.

Within hours of the announcement, the comments arrive. Traffic concerns. Environmental objections. Worries about what it means for local businesses. The thread grows. The same names appear, some familiar, some hiding behind a username. The noise keeps building until it can start to feel like the people we serve are adamantly opposed.

This is the STP problem in a nutshell.

The people who can't wait for that Costco to open? They're not in the comments section. They're at work. They're picking up their kids. They heard the news, shared it with a neighbor over text, and as busy people do, moved on with their day.

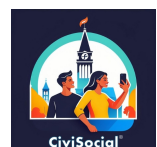
Meanwhile, a small vocal group is getting inside our heads. Feverishly pounding their keyboards, creating the impression of broad opposition when the reality is something very different.

You might ask: why doesn't the quieter majority just speak up?

It's simple. They're not seeing the noise. Less than 7% of Americans have ever joined a Facebook Community Group. The average active Facebook user skews significantly older than our median resident. The silent majority isn't engaging because they aren't even in the room where the argument is happening.

The challenge isn't that these voices exist. Every community has them. The challenge is when local government begins making decisions based on a small, loud, non-representative subset rather than the broader sentiment of the community it actually serves.

Guarantee that when that Costco opens, the lines will be around the block. And they'll probably include a majority of the STPs.



<b>The Silent Majority</b>	<b>The STPs</b>
Are active across a broad range of social media platforms. Facebook is not primary for them.	Live their online lives primarily on Facebook.
Are busy with their lives but do pay attention to the broad direction of their community and the work of local government.	Read every agenda. Attend every meeting. Address council during public comment. Take satisfaction in the attention they receive online. And remain myopically focused on minutia rather than the bigger picture.



## Reflection Questions

Take a moment to consider these individually, then discuss together. These are deliberately difficult questions, and answering honestly is important to recognizing the effects of problematic social media.

When you think about criticism on social media directed at us, how would you characterize the source?

- It feels broadly representative of our community
- It tends to come from a recognizable, recurring group
- I honestly can't tell who is behind most of it
- I try not to pay attention to it

How much do online comments and community groups currently influence policy decisions?

- More than they probably should
- We reference them but keep them in perspective
- Rarely as we have other ways of gauging sentiment
- This is something we haven't formally discussed as a team

When weighing an important decision, how deliberately do you consider the Silent Majority alongside the voices you're actually hearing?

- We actively discuss who isn't in the room and what they might need
- We try to, but the loudest voices tend to dominate the conversation
- We rely mostly on what feedback we see rather than seeking broader input
- This is a gap we recognize but haven't found a good way to address yet



# Why Do We Share

## Where the Real Conversation Is Happening

Picture a working parent in your community. Late thirties, maybe early forties. Two kids, a full schedule, and a phone that never seems to leave their hand.

They saw a neighbor's Instagram post about the new park breaking ground. They shared it to their story with a string of emojis and tagged three friends who also live in the neighborhood. It didn't arrive as an official announcement from their local government. It arrived as a recommendation from someone they trust, a neighbor who was genuinely excited about something good happening in their community.

When the fire broke out at Fred's place, they were capturing video of the flames as your fire crew arrived and saved his home. It wasn't drafted, approved, or scheduled. It was raw, emotional, and real — unfolding in real time for everyone who followed them.

These are the people you serve, communicating in the language of modern social media. They are engaged and paying attention. They are already telling your story, reacting to your decisions, and forming opinions about the direction of your work. They're just doing it in places that feel invisible to anyone whose primary frame of reference is a Facebook comment section.

While the STPs are dissecting the choice of parcel for the new park, or debating response time statistics in a thread fewer than fifty people will ever read, these organic stories have already reached deep pockets of your community without ever touching a Facebook feed.

## Comments vs. Shares

There is a simple way to think about the difference between comments and shares.

Comments tell you who is loud. Shares tell you who is listening.

A post that generates hundreds of comments but few shares is largely staying in one place. The same people, the same conversation, the same room. It may feel like engagement, but it is mostly noise cycling within an existing audience.

A post that gets shared travels. It moves through DMs, text messages, and in the feeds of people who have never visited your Facebook page or a community group. Every share is a neighbor telling another neighbor something worth knowing.

Think about the last post your organization put out that you genuinely felt proud of. Something that reflected your community well. Do you know if it was shared? Do you know where it went or who it reached?

If the answer is no, that's not unusual. Most local governments are measuring the wrong things. Comments are easy to see. Shares feel invisible. But invisible doesn't mean unimportant.

Creating content worth sharing isn't about going viral. It's about giving the Silent Majority something they'd want to pass along to someone they care about. That's a very achievable bar. And it starts with understanding what they actually value.

## Reflection Questions

Take a moment to consider these individually, then discuss together.

What do you believe average residents are most likely to share with someone they know?

- Policy announcements and council decisions?
- Alerts and service updates?
- Stories about people in our community and the work they do?
- Visible examples of our work in action?
- Detailed information to help them get up-to-speed on complex issues?

If you had to honestly assess your current social media content, how much of it feels like it is something akin to a compelling story, versus a piece of information?

- We are mostly sharing information.
- We share 50% information and 50% compelling stories.
- We are sharing mostly compelling human led stories.
- We have a lot of flyers and walls of text that probably don't reach a lot of people.



# Our Platforms

## What You Think You Know, and What's Actually True

Most local government social media strategy is built around a single assumption: that Facebook is social media. It's where your page lives. It's where residents comment. It's where the STPs hold court. And for a long time, that assumption was close enough to be useful.

It isn't anymore.

## YouTube

The most widely used social media platform in America isn't Facebook. It's YouTube. 84% of U.S. adults use it, crossing every age group, income level, and demographic line.

You probably use YouTube yourself, but don't think of it as social media. That's the problem.

YouTube is where your residents go to understand things. How their government works. What a new development means for their neighborhood. It is arguably the most powerful social media platform available to local government.

## Facebook

Time spent on Facebook rises consistently with age. Users between 55 and 64 spend an average of 45 minutes a day on the platform. Younger residents check in, scan, and move on to wherever they actually live online. Facebook is a specific slice of social media; older, more likely to be retired, with more time to engage and a platform that rewards their engagement.

Your working parent in their late thirties isn't in that comment section. They were there for four minutes this morning before the kids woke up to check in on their own mom-and-dad.

The people you're hearing from the most are not the same people you need to reach the most.

## Instagram

Millennials are 30-46 years old, and likely the majority adult age cohort in your community. Two thirds of U.S. adults between 30 and 49 are on Instagram. These aren't just young people. They are homeowners. Parents. People raising families in your community. This is where the Silent Majority spend a meaningful part of their day.

If you want to reach the people most likely to line up for that Costco on opening day, Instagram is where the conversation is happening.



## TikTok

In 2019, before TikTok became dominant in the U.S., Americans spent about 33% of their social media time watching video. Today that number is 61%. Every platform you use has fundamentally restructured itself to chase the short-form video format that TikTok pioneered.

The video your older community watches on Facebook? It was more-often-than-not created on TikTok first, shared to Instagram Reels, then made its way to Facebook weeks later. TikTok is where social media creativity is born. Everything else is downstream from it.

## Reflection Questions

Take a moment to consider these individually, then discuss together.

When a constituent raises a concern about something they saw on “social media”, which platform are they almost always referring to?

- Facebook (90%+ of the time)
- It varies depending on the issue
- A mix of platforms (outside of just Facebook and Next Door)

Where does your team spend the majority of its social media time and energy today (excluding the posting of meetings and live-streams on YouTube)?

- Facebook, almost exclusively
- Facebook and Instagram (we share mostly the same content on each)
- We use a mix of platforms to communicate and each has a specific content strategy

The goal of our current social media presence is to:

- Connect with our existing audience of concerned and engaged citizens
- Reach the broadest possible cross section of our community
- We haven't formally defined a goal
- This conversation is making us rethink what our goal should be



# Our Storytelling

## Social Media Didn't Add Video, It Became Video

Laura lives in your district. She's 42, has two kids, one in middle school, one in third grade, and her day doesn't slow down until well after dinner.

When it finally does, Laura doesn't reach for a newspaper. She doesn't open Facebook. She opens Instagram, and she scrolls. Not to stay informed. Not to participate in anything. To decompress. She's watching someone pipe buttercream roses onto a six-layer cake she will never attempt to make. She's saving a reel about a ten-minute evening skincare routine. She's half-watching, half-present, and genuinely relaxed for the first time since 7am.

In the morning, before the house wakes up, she rolls out a yoga mat and pulls up YouTube. This is different. She chose this. She has 30 minutes and she knows exactly what she came for. A familiar instructor, a flow she's done before, something that belongs entirely to her before the day takes over.

This is what integrated social media use actually looks like. Not a civic act. Not a political one. A deeply personal one, woven into the margins of a life that doesn't have many margins left.

Now consider what you are putting in front of her:

- A Canva flyer announcing the next council meeting.
- A paragraph explaining the new stormwater fee.
- A graphic with your logo in the corner and a date in bold.

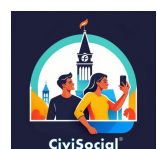
On Instagram, these don't read as information. They read as ads. And she has spent years training her thumb to swipe past ads before her brain has fully registered what they were selling.

It isn't that she doesn't care about her community. She filmed the fire at Fred's place. She shared the park groundbreaking to her story and tagged three neighbors. She is paying attention. She just isn't paying attention to content that looks like it was designed for a bulletin board.

Earlier we noted that Americans went from spending 33% of their social media time watching video to 61% in just a few years. That shift didn't happen because people suddenly became passive. It happened because video meets people where they already are. It speaks the language of the moment.

Now imagine this.

Laura is scrolling Instagram on a Tuesday night and a 45-second clip appears from a member of staff, the City Manager or Elected Official.



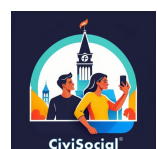
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No studio. No lower-third graphic. Just someone sitting in their car talking directly to the camera about what they're working on and why. It took three minutes to record.

She watches it to the end. Not because she was looking for it, but because she is invested in her community.

She doesn't comment. She watched it, and might share it with a friend. And the next time her local government appears in her feed, she'll recognize it.

She isn't expecting production value. She's craving authenticity and connection, something only organic video content can provide.



## Reflection Questions

Take a moment to consider these individually, then discuss together.

How would you describe your organization's current use of video on social media?

- We produce regular video content across multiple platforms
- We post video occasionally but it isn't a consistent part of our strategy
- Video is largely absent from what we do

Thinking about the content we currently post, and thinking about Laura scrolling Instagram on a Tuesday night, how much of what we produce would stop her thumb?

- Most of it! We're creating content that feels human and authentic
- Some of it. We have moments but they're inconsistent
- Honestly, very little. Most of what we post would scroll right past her
- We're not sure. We've never thought about our content through that lens

What do you believe is the biggest barrier to producing more video?

- We don't have the staff capacity or technical skills to produce it
- There are concerns about message control and staying on script
- We haven't prioritized it but there isn't a specific obstacle
- We've tried video but it doesn't seem to resonate. We don't have confidence in our approach



## What This Means For Us

If there's one thing to take from this conversation, it isn't that anything we've been doing is wrong. It's that the environment around us has changed.

For a long time, it made sense to focus on what we could see. Comments. Meetings. Public feedback. Those were the clearest signals available, and responding to them was the responsible thing to do.

Those signals still matter. But they are no longer the full picture. And in most cases, they are not representative of our whole community. The way residents consume information has changed faster than most local governments have been able to adapt. That isn't a failure of leadership. It's the reality of operating inside institutions that move deliberately while the platforms around them move constantly.

But awareness without a response is just a more informed version of the status quo.

The question in front of us isn't whether to change. It's what we're willing to agree on together before we decide how.

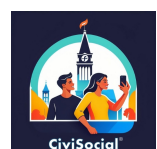
A few principles worth aligning on:

(1) Can we agree to measure reach, not just noise? Comments and public comment periods will always have a place. But they are not a reliable measure of what our community thinks or needs. This requires looking for signals beyond the loudest voices to ground our decisions and operations, even / especially when Facebook erupts?

(2) Will we create content for the people who aren't engaging, not just the ones who are? Laura isn't in the comment section. She isn't at the meeting. She is paying attention in her own way, and she deserves content that meets her there. This may require additional learning and resources.

(3) Can we strive to make our work visible in ways that feel human? Not every post needs to be polished. Some of the most effective communication we can do is a real person, talking plainly, about something that matters. This requires a degree of collective courage and trust between us.

(4) How will we define what success looks like before we measure it. Likes and follower counts are easy to track and largely meaningless. Reach, shares, and whether residents feel informed are harder to measure and worth pursuing. This requires mutual patience and an agreed upon data-set.



## Final Reflections

Take a moment to consider these individually, then discuss together.

Which of these principles feels aligned with where we see our social media? (select all that apply)

- Seeking reach beyond visible engagement
- Creating content for residents who aren't actively participating
- Making our work visible in a more human way
- Defining success before measuring it
- Building shared data-set that we agree to measure our progress with

Which feels furthest from where we are today, and most important to address first?

- Measuring reach beyond visible engagement
- Creating video content for residents who aren't actively participating
- Making our work visible in a more human way
- Defining success before measuring it
- Building shared data-set that we agree to measure our progress with

Other \_\_\_\_\_

Given everything we've discussed, where do you land on the question of prioritization of social media?

- Modern communications should be a top priority. We need to get this right.
- We are doing fine on social media and could optimize to get better.
- We should not change our approach based on this conversation.

Where do you land on the question of investment — in time, resources, and leadership attention?

- We should look at a more significant investment to expand our team and add resources.
- See what can be done with existing resources and perhaps a small investment to improve.
- We need to spend money elsewhere and this is not a priority.



## One Final Reflection

This conversation was designed to be uncomfortable in places. Not to assign blame, but because the communities you serve deserve leaders who are willing to sit with hard questions together.

You've just done that.

Before you close this guide, take a moment. No agendas, just turn to one another and answer this honestly:

What struck you most? And what do you want to be different a year from now?

Not for the organization. Not for the next council meeting. For the residents who are out there right now, paying attention in ways you may not have fully seen before today.

That's where this conversation was always headed. Not to a plan. To a shared commitment to the people who depend on you, including the ones who will never show up to tell you so.



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# EL DORADO

## KANSAS

TO: City Commission  
FROM: David Dillner, City Manager  
SUBJ: Code of Ethics  
DATE: June 10, 2026

### **Background:**

Given recent controversy, it makes sense to step back and assess opportunities for the municipal government to improve its relationship with the public. Many comments have been made by the public that point to the need for more transparency and accountability, especially as it relates to economic development decisions. The City Commission should review its Code of Ethics to determine if any changes are warranted to address issues raised by members of the public. The code should define acceptable behaviors for the governing body, staff, advisory boards, and even vendors and contractors working with the City. A code of ethics, with proper enforcement, can prevent unethical behavior and provide the public with assurance that decisions and actions by the municipal government are aligned with the public's interests.

The purpose of a Code of Ethics is to establish a clear framework for ethical decision-making, public transparency, conflicts of interest, respectful conduct, and responsible stewardship of public resources. Municipal government depends on public trust. Residents expect City officials and employees to make decisions fairly, disclose conflicts when they exist, use public resources responsibly, protect confidential information when required, and conduct public business as openly as the law allows. A written Code of Ethics places those expectations in one document and provides a common reference point for the City Commission, appointed officials, City employees, and the public. The Code does not replace Kansas law, City ordinances, personnel policies, purchasing policies, the Kansas Open Meetings Act, the Kansas Open Records Act, or legal advice from the City Attorney. Rather, it serves as a practical guide for conduct and decision-making within the City organization.

### **Attachments:**

1. Code of Ethics for the City of El Dorado, Kansas
2. Legal Opinion - Conflict of Interest Law vs Ethical Standards

### **Advisory Board Recommendation:**

Not Applicable

### **Policy Issue:**

**Should the City revisit its Code of Ethics for elected and appointed officials, employees, and vendors, contractors, and others associated with the City?** A Code of Ethics provide value to municipal governments in several ways.

First, it can clarify expectations for the governing body and communicate these expectations to the public. The City Commission operates in a public environment where policy disagreements, competing community priorities, and financial trade-offs are part of the job. A Code of Ethics can help establish shared standards for how members interact with one another, staff, residents, applicants, vendors, and community partners.

Second, it reinforces the distinction between governance and administration. In the commission-manager form of government, the governing body sets policy direction, while the City Manager

administers City operations and directs staff. A Code of Ethics helps protect that structure by clarifying communication expectations, staff interaction boundaries, and appropriate channels for operational concerns.

Third, it supports consistency across the organization. Although the initial request relates to the City Commission, ethical expectations also affect employees, appointed boards, advisory committees, purchasing, service delivery, enforcement, permitting, personnel matters, and public communication. A broader Code of Ethics applicable across the organization aligns elected leadership and administrative operations under the same general principles.

Finally, it provides a proactive tool for public confidence. Ethics policies are most useful when they are adopted before a controversy occurs. Unfortunately, the City may not have the luxury of timing, given the adversarial environment arising from the recent controversy. The City Commission should take a step back and assess the opportunity from the perspective of improvement. This will enable the governing body and staff to reframe the municipal government's relationship with the public by articulating and focusing on behaviors that facilitate good governance. It is important to note that the City Commission and staff have not taken any actions beyond standard practices and legal boundaries. Even so, it is appropriate to define ethical behaviors that the municipal government will hold itself accountable to and to create a means of facilitating compliance.

A Code of Ethics should address the following areas:

- **Public Service and Integrity:** Expectations that City officials and employees place the public interest above personal, political, financial, or private interests when conducting City business.
- **Transparency and Open Government:** Commitment to conducting public business openly and complying with applicable open meetings, open records, and records retention requirements.
- **Conflicts of Interest:** Standards for identifying, disclosing, and managing actual or potential conflicts of interest, including financial interests, business relationships, employment relationships, family interests, and matters involving close personal associations.
- **Use of Public Resources:** Expectations regarding the use of City funds, equipment, vehicles, facilities, supplies, technology, staff time, and official authority.
- **Gifts, Favors, and Special Treatment:** Guidance on accepting gifts, meals, entertainment, discounts, services, or other items of value that could influence, or appear to influence, official action.
- **Confidential Information:** Standards for protecting legally confidential information, including executive session matters, attorney-client communications, personnel information, law enforcement information, economic development information, and other protected records.
- **Respectful Conduct:** Expectations for professional interaction among Commissioners, employees, residents, applicants, vendors, board members, and community partners.
- **Commission-Staff Relations:** Clarification that individual Commissioners should not direct City employees or interfere with administrative operations, except through the City Manager or as otherwise authorized by law or policy.
- **Public Communication and Social Media:** Guidance for distinguishing personal opinions from official City positions and avoiding communications that may create open meetings, records, confidentiality, or public trust concerns.
- **Reporting, Guidance, and Review:** A process for seeking guidance, reporting concerns, avoiding retaliation, and periodically reviewing the Code.

**Fiscal Impact:**

Not Applicable

**Trade-Offs:**

Not Applicable

**Staff Recommendation:**

The City Manager recommends the City Commission provide direction to staff regarding the development of a Code of Ethics and authorize the preparation of a draft policy for future consideration by the City Commission. A Code of Ethics should apply to the following municipal groups, with role-specific expectations where appropriate:

- Members of the City Commission;
- Members of appointed boards, commissions, committees, and advisory bodies;
- City Manager, department directors, supervisors, and all City employees; and
- Contractors, consultants, volunteers, or others acting on behalf of the City, where applicable by contract, policy, or law.

Because elected officials, appointed officials, and employees are accountable through different mechanisms, the Code should distinguish between guidance for the governing body and employment-related requirements for City staff. Employees would remain subject to the City's personnel policies and disciplinary procedures.

**Commission Action:**

This item is for discussion purposes only. The item will be scheduled for consideration at a regular meeting pending direction to do so by the City Commission.

## Code of Ethics

### A. Declaration of Policy

The proper operation of our government requires that public officials and employees be independent, impartial and responsible to the people; that governmental decisions and policy be made in the proper channels and that the public have confidence in the integrity of its government. In recognition of those goals, there is hereby established a code of ethics for all officials and employees, whether elected or appointed, paid or unpaid. The purpose of this code is to establish ethical standards by setting forth those acts or actions that are incompatible with the best interests of the city.

### B. Responsibilities of Public Office

Public officials and employees are agents of public purpose and hold office for the benefit of the public. They are bound to uphold the Constitution of the United States and the Constitution of this State and to carry out impartially the laws of the nation, state, and city and thus to foster respect for all government. They are bound to observe in their official acts the highest standards of morality and to discharge faithfully the duties of their office regardless of personal considerations, recognizing that the long term public interest must be their primary concern. Their conduct in both their official and private affairs should be above reproach.

### C. Dedicated Service

All officials and employees of the city should be responsive to the political objectives expressed by the electorate and the programs developed to attain those objectives. Appointive officials and employees should adhere to the rule of work and performance established as the standard for their positions by the appropriate authority.

Officials and employees should not exceed their authority or breach the law or ask others to do so, and they should work in full cooperation with other public officials and employees unless prohibited from so doing by law or by officially recognized confidentiality of their work.

### D. Fair and Equal Treatment

- (1) Interest in Appointments. Canvassing of members of the city commission, directly or indirectly, in order to obtain preferential consideration in connection with any appointment to the municipal service shall disqualify the candidate for appointment except with reference to positions filled by appointment by the city commission.
- (2) Use of Public Property. No official or employee shall request or permit the use of city-owned vehicles, equipment, materials or property for personal convenience or profit, except when such services are available to the public

generally or are provided as city policy for the use of such official or employee in the conduct of official business.

- (3) **Obligations to Citizens.** No official or employee shall grant any special consideration, treatment, or advantage to any citizen beyond that which is available to every other citizen.

#### E. Conflict of Interest


No elected or appointive city official or employee, whether paid or unpaid, shall engage in any business or transaction or shall have a financial or other personal interest, direct or indirect, which is incompatible with the proper discharge of his or her duties in the public interest or would tend to impair his or her independence of judgment or action in the performance of his or her official duties. Personal as distinguished from financial interest includes an interest arising from blood or marriage relationships or close business or political association.

Specific conflicts of interest are enumerated below for the guidance of officials and employees:

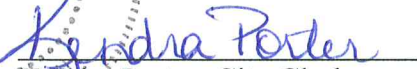
- (1) **Incompatible Employment.** No elected or appointive city official or employee shall engage in or accept private employment or render services for private interests when such employment or service is incompatible with the proper discharge of his or her official duties or would tend to impair his or her independence of judgment or action in the performance of his or her official duties.
- (2) **Disclosure of Confidential Information.** No elected or appointive city official or employee, shall, without proper legal authorization, disclose confidential information concerning the property, government or affairs of the city. Nor shall he or she use such information to advance the financial or other private interest of himself, herself or others.
- (3) **Gifts and Favors.** No elected or appointive city official or employee shall accept any valuable gift, whether in the form of service, loan, thing or promise, from any person, firm, or corporation which to his or her knowledge is interested directly or indirectly in any manner whatsoever in business dealings with the city; nor shall any such official or employee (a) accept any gift, favor or thing of value that may tend to influence him or her in the discharge of his or her duties or (b) grant in the discharge of his or her duties any improper favor, service or thing of value. The prohibition against gifts or favors shall not apply to: (a) an occasional nonpecuniary gift, of only nominal value or (b) an award publicly presented in the recognition of public service or (c) any gift which would have been offered or given to him or her if not an official or employee.

- (4) Representing Private Interest before City Agencies or Courts. No elected or appointive city official or employee whose salary is paid in whole or in part by the city shall appear in behalf of private interest before any agency of this city. He or she shall not represent private interests in any action or proceeding against the interest of the city in any litigation to which the city is a party.
- (5) No city officer or employee shall be signatory upon, discuss in an official capacity, vote on any issue concerning or otherwise participate in his or her capacity as a public official or employee in the making of any contract with any person or business:
- a. In which the officer or employee owns a legal or equitable interest exceeding \$5,000 or five percent, whichever is less, individually or collectively with his or her spouse; or
  - b. From which the officer or employee receives, in the current or immediately preceding or succeeding calendar year, any salary, gratuity, other compensation or a contract for or promise or expectation of any such salary, gratuity or other compensation or remuneration having a dollar value of \$1,000 or more; or
  - c. In which he or she shall hold the position of officer or director, irrespective of the amount of compensation received from or ownership held in the business.

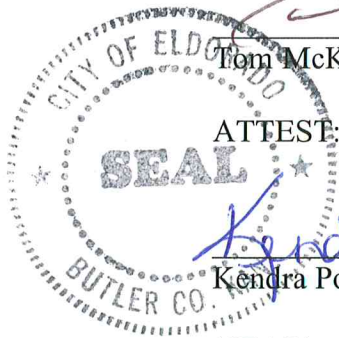
PASSED AND APPROVED BY THE GOVERNING BODY OF THE CITY OF EL DORADO, KANSAS THIS 7th DAY OF JULY, 2008.

  
Tom McKibban, Mayor

ATTEST:

  
Kendra Porter, City Clerk

(SEAL)





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**May 27, 2026**

**To: City Manager David Dillner  
City of El Dorado  
220 East 1st Avenue  
El Dorado, Kansas 67042**

**From: Ashlyn Brianne Lindskog**

**RE: Conflict of Interest Law vs. Ethical Standards for City Commissioners**

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## Overview

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Following recent public commentary and the concerns historically raised in my time serving as City Attorney related to conflict of interest issues, I met with David and we discussed how, as typically happens, two distinct issues are being conflated in the public conversation regarding these issues. (1) What Kansas law actually requires regarding conflicts of interest; and (2) What this Commission could voluntarily adopt as ethical standards that go beyond the legal requirements.

These are different things, and the distinction matters enormously both legally and politically. The central weakness in most municipal ethics frameworks is that a policy that the Commission will not enforce against its own members is not a policy. **It is theater, and it will make things worse.**

---

## What the Public Is Saying vs. What the Law Requires

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The comments circulating on social media and in Commission meetings have raised conflict of interest claims tied to several specific situations: Commissioner Wilkinson's vote on a rezoning matter in which her son is the developer, questions about Commissioner Scribner's relationship as Commissioner Wilkinson's daughter-in-law, and suggestions that other Commissioners' professional or family ties to various entities disqualify them from certain votes. These claims deserve a serious legal response rather than silence, because silence reads as confirmation.

Under K.S.A. 75-4304, a local elected official is prohibited from making or participating in the making of a contract with any person or business in which the official holds a substantial interest.

A "substantial interest" under Kansas law means a direct or indirect ownership interest of more than two percent of the total assets or capital stock, or a position as officer, director, or partner in the relevant entity. The statute does not extend to familial relationships alone. A Commissioner voting on a matter that financially benefits an adult child does not automatically hold a "substantial interest" in that child's business, and Kansas advisory opinions have consistently



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drawn this line. One community commenter in the circulating comments correctly noted this: voting for a family member's project may be ethically questionable, but it is not legally a conflict of interest unless the Commissioner directly benefits financially.

---

## The Difference Between Legal Compliance and Ethical Standards

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Kansas law sets a minimum. It requires elected officials to file a Statement of Substantial Interests, to abstain from participating in contracts in which they hold a substantial interest as defined above, and to leave the room when such matters are being discussed. The Kansas Public Disclosure Commission has advisory jurisdiction over local officials but cannot adjudicate complaints, and violations of the local conflict statutes are handled through the county or district attorney by criminal complaint. In other words, the state framework is largely self-executing and self-reporting, with enforcement that is reactive rather than proactive.

Many municipalities have recognized this gap and adopted local codes of ethics that set higher standards, clearer disclosure procedures, and defined processes for raising and resolving concerns. The City of Wichita, for example, adopted a formal Code of Ethics for City Officials by ordinance and established a separate Ethics Board with authority to receive complaints, censure officials, and impose fines of up to \$1,000 per violation. Critically, the Wichita Ethics Board is composed entirely of individuals who may not be City Council members, city employees, or their spouses, who may not hold elected office, and who may not be active members of any political party. That independence is what gives the body credibility.

The lesson from Wichita, however, is also cautionary. After adopting the ethics policy in 2021, the Ethics Board went seven months without meeting and failed to review any of the four complaints filed against it, largely because the City could not fill the required ethics officer position. Four complaints sat unaddressed and obviously, the public noticed. The takeaway is not that ethics policies are futile; it is that a policy without a functional enforcement mechanism produces exactly the outcome it was meant to prevent: the appearance that officials have no accountability.

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## The Accountability Problem

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The next step starts with an honest assessment: the City of El Dorado does not currently have a local Code of Ethics, a conflict of interest disclosure procedure beyond the state minimum, a recusal protocol requiring Commissioners to state their reasoning on the record, or any mechanism by which a fellow Commissioner is required to raise a concern about a peer's participation in a matter. What exists is a Public Comment Policy from 2005, a Code of Procedure adopted in January 2023 that governs meeting process, and the state-required Statement of Substantial Interests filing, which goes to the Butler County Election Officer and is not proactively published anywhere on the City's own website. That is the full inventory.

The state framework fills some of this space, but not the part that matters most here. Under K.S.A. 75-4304, it is up to each individual Commissioner to determine whether a conflict of interest exists and to act accordingly. There is no external body that makes this call for them at the local level. The Kansas Public Disclosure Commission has advisory jurisdiction only over local officials and explicitly cannot adjudicate complaints. Violations of the local conflict statutes



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are handled through the county or district attorney by criminal complaint, which means the enforcement mechanism is reactive, slow, and reserved for conduct that rises to a criminal threshold. Everything below that threshold is governed entirely by individual judgment and individual integrity.

This is the structural gap the public is reacting to, even if they are not articulating it in those terms. When a Commissioner votes on a matter that appears to benefit a family member, and no other Commissioner says anything, and no policy requires anyone to say anything, and the only recourse is a criminal complaint to the district attorney, the public draws the reasonable inference that the Commission is not holding itself accountable. That inference may be legally unfair. It is politically real, and the current situation demonstrates exactly how quickly it compounds.

The lesson from other municipalities that have tried to address this gap is worth understanding clearly, because it cuts both ways. A policy the Commission will not deploy against its own members is not accountability. It is the illusion of accountability, and in a moment like this one, the illusion is more damaging than the absence of a policy would have been.

Whatever framework the Commission adopts, the central design question is not what the policy says. It is who enforces it when a Commissioner does not self-report, and whether the remaining Commissioners are willing to act on that mechanism when it is a colleague sitting across the dais. That question has to be answered honestly before any policy is worth adopting, because the community will be watching not for what is written but for whether it is used.

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## What I Recommend

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Given the current environment, and after discussing the idea with David, I believe the Commission has an opportunity to get ahead of this in a way that is both substantive and credible. The steps I would recommend, in order of priority, are as follows.

- First, adopt a formal written Code of Ethics by resolution or ordinance that goes beyond the K.S.A. 75-4304 floor.
  - At minimum it should define the categories of relationship, including family members with financial interests in matters before the Commission, that trigger a duty to disclose and consider recusal.
  - It should establish a clear, public recusal procedure that requires the Commissioner to state on the record the nature of the potential conflict and their decision, rather than simply leaving the room without explanation.
  - Transparency in the moment is itself a form of accountability.
- Second, and I understand that this is a harder conversation, the Commission must decide in advance how it will respond when a fellow Commissioner does not self-report an apparent conflict.
  - The code is meaningless without a defined process by which any Commissioner can raise a concern, have it reviewed, and receive a documented response.
  - That process does not require a standing ethics board here, but it does require that someone other than the individual Commissioner makes the final call when a conflict is contested.



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- One workable model for a smaller city is to designate the City Attorney to receive and evaluate conflict concerns from any Commissioner or from the public, issue a written advisory opinion, and present that opinion at a public meeting. The Commission then acts on the record. This is not perfect, but it is transparent.
- Third, the Commission should hold an annual public session at which it reviews its ethics policy, acknowledges any situations where the policy was invoked or should have been, and evaluates whether the current standards are adequate. This accomplishes something that no written policy alone can: it signals to the community that accountability is ongoing rather than reactive.

---

## The Disclosures Already Exist

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One of the most effective responses available to the Commission right now costs nothing and requires no new policy: proactively publishing the Statements of Substantial Interests already on file with the Butler County Election Officer for each sitting Commissioner.

Under K.S.A. 75-4301 et seq., every elected local official in Kansas is required to file a Statement of Substantial Interests disclosing financial holdings, business relationships, and other interests that could bear on their official duties. These statements are public records. They are already filed. They are already available for inspection. The Commission did not hide these interests, and the public has always had the right to see them. What is missing is the proactive step of surfacing them in a moment when the community is actively questioning whether Commissioners have undisclosed conflicts.

The community conversation reflected in the social media comments suggests that many residents believe Commissioners voted on matters without disclosing relevant interests. The factual answer to that narrative is not a defensive statement, but the documents themselves. Publishing the Statements of Substantial Interests for each Commissioner, alongside a plain-language explanation of what the disclosure requirement covers and what it does not may accomplish several things at once.

It demonstrates that the interests now being characterized as hidden were disclosed before the relevant Commissioners were ever elected. The voters of El Dorado had access to this information and elected these individuals anyway. That is not a minor point. It is the democratic record. The public chose these Commissioners with knowledge, or at minimum with available access to knowledge, of their financial interests and relationships.

It also draws the distinction, clearly and factually, between a disclosed interest and a legal conflict of interest. The comment thread reflects genuine confusion about this difference, with multiple residents treating family relationships and business ties as automatic disqualifiers. Publishing the disclosures, paired with a brief factual explanation of what Kansas law actually requires and prohibits, lets the documents do the work rather than requiring the Commissioners individually to make that argument where it will be dismissed as self-serving.



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## A Final Note on the Current Situation

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Nothing in the above is an admission that any Commissioner has violated Kansas law. The legal standard for conflict of interest is specific and was likely not met in the situations being cited publicly. But the legal standard and the public trust standard are different things, and right now the Commission has a public trust problem. Adopting a serious, enforced ethics framework is one of the few tools available that demonstrates the Commission heard the community's concern and responded substantively rather than defensively. That is worth doing regardless of whether any specific prior vote was legally improper.

Final Report

# CITY OF EL DORADO

## NORTHEAST PRESSURE ZONE EVALUATION

PEC PROJECT NO. 250458-000

APRIL 2026



PREPARED BY  
PROFESSIONAL ENGINEERING CONSULTANTS PA  
303 S. Topeka Wichita, KS 67202 316-262-2691 [www.pec1.com](http://www.pec1.com)

# El Dorado Northeast Pressure Zone Evaluation

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## **El Dorado Northeast Pressure Zone Evaluation**

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# El Dorado Northeast Pressure Zone Evaluation

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# **El Dorado Northeast Pressure Zone Evaluation**

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## **1.0 Introduction**

The City of El Dorado retained the services of Professional Engineering Consultants (PEC) to develop an updated working computer model of the City's water distribution system and perform a detailed analysis of the system's capabilities in order to prepare a plan for the creation of a northeast pressure zone. This report presents the information utilized to prepare the hydraulic water model, evaluation of the model to determine system deficiencies, alternatives to address identified system deficiencies, and a summary of recommended system improvements.

### **1.1 Study Objective**

The primary objective of this study is to determine water distribution system improvements needed to address current system deficiencies and develop the proposed northeast pressure zone. This objective included analyzing current system demands, distribution system piping, pumping capabilities, and storage volumes.

The computerized model of the distribution system was developed using the Bentley WaterGEMS software. The model was analyzed to determine if there were adequate system pressures, available fire flows, water storage, and conveyance infrastructure for current flows. The model was also analyzed to determine these metrics for the proposed NE pressure zone.

### **1.2 Scope of Study**

This study includes the following elements:

- Description of the existing water distribution system.
- Development of a computerized water model of the existing distribution system with 4-inch piping and larger, and smaller piping as necessary.
- Calibration of the water model based on field flow testing information.
- Evaluation of the water model for current average day, maximum day, and peak hour demands to determine distribution system deficiencies.
- Evaluation of the water model for fire flow scenarios to determine available fire flow with existing infrastructure.
- Evaluation of the water model to determine water age throughout the distribution system.
- Development of system improvement recommendations to address system deficiencies and establish a northeast pressure zone
- Development of budget level construction cost estimates for recommended improvements.

## El Dorado Northeast Pressure Zone Evaluation

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### 2.0 Water Demands

Current water demands must be determined to accurately analyze current system performance and identify improvements needed for future growth. Average daily demand (ADD) usage is typically utilized as the base demand for a water system. In addition to the average daily use, the distribution system must also be able to supply adequate flow and pressure for the maximum daily demand (MDD) and peak hour demand (PHD) conditions.

The MDD accounts for seasonal and annual fluctuations in flow while PHD accounts for typical daily usage patterns. Water usage is typically higher in dry years and during the summer months. The increase in demand in summer months is mainly due to the increase in irrigation and water recreation (pools, splashpads, etc.). Water usage also typically follows a diurnal pattern during the day with low usage at night and peak usage in the early morning and early evening hours. The high-water use during the early morning and early evening is due to the normal daily pattern of typical residential customer water use activities (showering, cooking, laundry, etc.).

#### 2.1 Historical Water Demands

The City provided historical monthly water use reports from 2020 to 2024. The ADD was calculated by dividing the total water usage for each year by 365 days. The MDD was calculated by taking the maximum amount of raw water diverted in one month for each year and dividing it by 31 days. The MDD ratio was determined from this data by dividing the MDD by the ADD over the 5 years. The City’s historical demand data is summarized in Table 2-1.

**Table 2-1: Historical Water Demands**

Year	Total Annual Usage (MGY)	Average Day Demand (MGD)	Maximum Day Demand (MGD)	MDD Ratio
2020	1,104	3.03	3.82	1.26
2021	1,107	3.03	3.99	1.32
2022	1,269	3.48	5.54	1.59
2023	1,172	3.21	4.21	1.31
2024	1,121	3.07	4.38	1.43
<b>Average</b>	<b>1,155</b>	<b>3.16</b>	<b>4.39</b>	<b>1.39</b>

The average annual usage over this period was 1,155 million gallons per year (MGY) or 3.16 million gallons per day (MGD). The maximum day demand was 4.39 MGD which resulted in an MDD ratio of 1.39. Based on the data summarized in Table 2-1, the approximate annual water usage rate over this period increased by 0.4%.

## **El Dorado Northeast Pressure Zone Evaluation**

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The total average annual usage of 1,155 MGY divided by the City's population of 12,870 people (per 2020 US Census Bureau data) equates to an average per capita water demand of approximately 246 gallons per capita per day (gpcd). However, it is important to note that the top 11 water users in the system, which include wholesale customers and a large industrial user, account for over 50% of total system use (reference section 2.2). As these are abnormally large users and contribute to demand outside of El Dorado's population, it is beneficial to review the per capita demand with these users excluded. When the demand of these users are removed, the remaining average total annual usage is approximately 526 MGY. This total equates to a per capita demand of approximately 112 gpcd. For comparison, the City of Derby and the City of Haysville currently have an average water demand per capita of approximately 87 gpd and 84 gpd, respectively.

### **2.2 Top Water Users**

The City provided metered usage rates from 2022 to 2024 for the top 20 users in the system. The evaluation of the billing reports showed that these users account for approximately 57.8% of the total demand. The City's top water user is Rural Water District #5, which accounts for 10.5% of the total demand in the system. Water demands for the top users are summarized in Table 2-2. A map showing the location of the top 20 users in the City is shown in Figure 1.

## El Dorado Northeast Pressure Zone Evaluation

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**Table 2-2: Top 20 Water Users**

User	Average Day Demand (GPD)	Maximum Day Demand (GPD)	% of Total City Demand
Rural Water Dist. #5	342,101	508,097	10.5%
Rural Water Dist. #6	323,788	489,113	9.9%
Public Whlse Wtr #8	222,786	337,703	6.8%
Department of Corrections	218,113	266,216	6.7%
Rural Water Dist. #4	111,808	140,221	3.4%
Holly Frontier Refining LLC	105,918	160,345	3.3%
Rural Water Dist. #2	103,804	145,477	3.2%
City of Potwin	83,417	106,297	2.6%
Rural Water Dist. #7	82,998	148,245	2.6%
Rural Water #1	71,193	103,806	2.2%
Rural Water Dist. #3	57,406	264,108	1.8%
Silverwood Apartments	29,693	46,229	0.9%
Butler Co Community College	26,850	70,442	0.8%
Susan B Allen	17,313	28,432	0.5%
City (Legion Golf)	14,751	205,368	0.5%
Butler Co Community College	14,324	85,881	0.4%
Walnut River Residence	13,052	24,813	0.4%
Ergon Asphalt & Emulsions	12,212	25,368	0.4%
Mitchell, Larry	10,811	33,723	0.3%
City (Swimming Pool)	10,424	51,800	0.3%
<b>Total</b>	<b>1,882,521</b>	<b>3,241,685</b>	<b>57.8%</b>

### 2.3 Northeast Pressure Zone Projected Water Demands & Growth Areas

Projections for future water demands for the northeast pressure zone were calculated based on residential and commercial development within the proposed development area. The Water Treatment and System Master Plan completed by Black & Veatch in 2022 determined that development of the 700-acre growth area would result in an additional demand of 700,000 gallons per day (gpd) in the northeast zone.

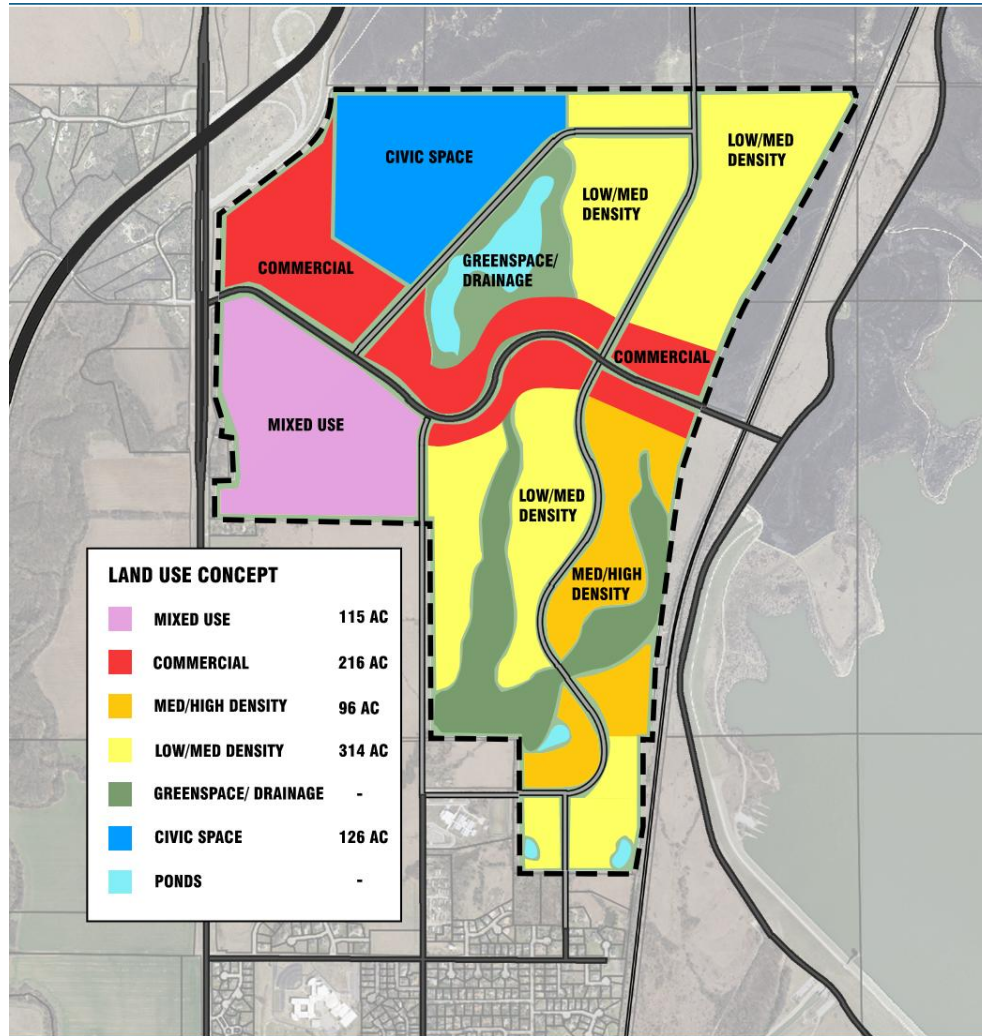
## **El Dorado Northeast Pressure Zone Evaluation**

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Since the 2022 report, additional concepts for land use in the northeast pressure zone have been created. These latest maps include approximately 860 acres of development with a mixture of residential, commercial, and civic uses. Projected demands for these areas were calculated based on Kansas Department of Health and Environment (KDHE) recommended values for each usage type. KDHE recommended values for calculating demand in residential areas assume 3 units per acre, 3 people per unit, 100 gpd per person and a peaking factor of 3. Commercial areas are assumed to have a peak demand of 5,000 gallons per day. Outside of the development acres outlined in the concept mapping, there are additional residential areas expected to contribute demand to the northeast pressure zone. One of these areas is known as the “Banks Property” located near E 30<sup>th</sup> St and Highway 77 and is expected to add approximately 105 residential units to the zone. As the zone is created, the intent is to incorporate some of the existing residential areas near McCollum Rd and east of Country Club Rd into the new northeast pressure zone. These areas include approximately 300 existing residential units that would contribute to the zone’s demand and also benefit from an increase in pressure due to being in a low-pressure area. A summary of the total projected northeast pressure zone demand is shown in Table 2-3.

## El Dorado Northeast Pressure Zone Evaluation

**Figure A: Meyers Development Land Use Concept**



**Table 2-3: Projected Northeast Zone Demands**

Area #	Land Use Type	Area (ac)	# of Units	Average Demand (gpd)	Peak Demand (gpd)
1	Low / Med Density Residential	314	628	188,400	565,200
2	Med / High Density Residential	96	288	86,400	259,200
3	Commercial	216	-	360,000	1,080,000
4	Mixed Use	115	172.5	147,583	442,750
5	Civic Space	126	-	147,000	441,000
6	Residential (Banks Property)	-	105	31,500	94,500
7	Residential (Existing)	-	300	90,000	270,000
<b>Total Demands</b>				<b>1,050,883</b>	<b>3,152,650</b>

## **El Dorado Northeast Pressure Zone Evaluation**

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### **3.0 Existing Water Distribution System**

The City's water is sourced from the El Dorado Reservoir and is treated at the El Dorado Water Treatment Plant (WTP). The treated water is pumped into the distribution system from the high service pump station (HSPS) located at the treatment plant. The City provides treated water for several wholesale customers that account for the majority of the City's top users including Rural Water Districts, the City of Potwin, Holly Frontier Refinery, and the El Dorado Department of Corrections. The distribution system includes approximately 125 miles of water mains, 600 fire hydrants, one booster pump station, and three water towers. An overview of the water distribution system is presented in Figure 2.

#### **3.1 Water Mains**

Distribution system hydraulics are influenced by waterline material and age. As waterlines age, buildup may occur within the pipe that reduces the effective inner diameter and creates poor hydraulic flow characteristics. Roughness coefficients are assigned to pipes in the model to represent the anticipated hydraulic conditions within the pipe.

Most pipes in the system are polyvinyl chloride (PVC), ductile iron (DI), or cast iron (CIP). The City's geographic information system (GIS) mapping does not distinguish between ductile and cast-iron pipes, with all types of metal pipes being labeled Steel Pipe (SP). The distribution system piping materials are shown in Figure 3.

Waterline sizes in the distribution system also greatly affect the amount of water that can be distributed throughout the system. Generally, larger diameter water mains provide flow to each major service area with smaller service lines branching off as required. Current waterline sizes are shown in Figure 4.

#### **3.2 Fire Hydrant Coverage Area**

The distribution system was evaluated to determine current fire hydrant coverage assuming each hydrant covers a 400-foot radius based on standard fire department hose lengths. In general, the system has adequate fire hydrant coverage for existing structures in the event of a fire. The only areas that appear to lack adequate fire hydrant coverage are the structures along Douglas Rd between SW Traffic Way and Park Ave. Fire Hydrant Coverage is shown in Figure 5.

## El Dorado Northeast Pressure Zone Evaluation

### 3.4 Storage

The City currently has three elevated storage tanks with a total storage volume of 1.25 MG. The locations of the existing water towers are shown in Figure 2. The attributes of the towers are shown in Table 3-1.

**Table 3-1: Water Storage Tanks**

Tank Name	Volume (MG)	Overflow Elevation (ft)	Diameter (ft)
Industrial Tower	0.5	1446.10	55
6 <sup>th</sup> Ave Tower	0.25	1446.10	40
McCullum Tower	0.5	1446.10	50

### 3.5 Pump Stations

The distribution system pressure is supplied and maintained by the WTP high service pump station, one booster pump station, and the water towers. The WTP has four high service pumps with the design points summarized in Table 3-2. The pumps have variable frequency drives. Current operation of these pumps includes manual controls by plant staff. A full description of current pump operation is in Section 3.7.

**Table 3-2: WTP High Service Pumps**

Pump Name	Design Flow (gpm)	Design Head (ft)
HSPS -1	3,000	250
HSPS- 2	1,000	250
HSPS- 3	2,000	250
HSPS- 4	3,000	250

The booster pump station is located near the industrial tower and supplies water to the west high-pressure zone. The station consists of 5 pumps with the design points summarized in Table 3-3. Controls for the booster pump station are described in section 3.7.

**Table 3-3: Booster Pump Station Design Points**

Pump Name	Design Flow (gpm)	Design Head (ft)
NW Pump-1	400	95
NW Pump-2	800	95
NW Pump-3	800	95
NW Pump-4	2000	95
NW Pump-5	3000	95

## El Dorado Northeast Pressure Zone Evaluation

### 3.7 Existing System Controls

The City has a remote Supervisory Control and Data Acquisition (SCADA) system that is utilized to implement their system controls. The control set points for the high service and booster pumps are based on either downstream pressures or water tower levels. The HSPS operates in a lead-lag sequence based on the setpoints of the Industrial Tower. The booster pump station will operate based on maintaining downstream pressures. Both the 6<sup>th</sup> Ave and McCollum Towers include altitude valves that open and close at specified levels. In addition to the automatic SCADA controls, the City manually operates the pumps at the HSPS to assist in water tower cycling. City staff turn pumps off in the morning to manually draw tower levels down before kicking the system back to automated controls. A summary of current system controls is provided in Table 3-4.

**Table 3-4: Existing System Control Set Points**

Element / Pump Station	Operation	Parameter	Level (Hydraulic Grade) /Downstream Pressure
WTP High Service Pump Station	Lead Pump On	Industrial Tower	$\leq 60.70$ (1427.1 ft)
	Lead Pump Off	Industrial Tower	$\geq 77.70$ (1444.1 ft)
	Lag Pump On	Industrial Tower	$\leq 58.70$ (1425.1 ft)
	Lag Pump Off	Industrial Tower	$\geq 69.70$ (1436.1 ft)
McCollum Altitude Valve	Valve Closed	McCollum Tower Level	$\geq 89.6$ (1431.6 ft)
6 <sup>th</sup> Ave Altitude Valve	Valve Closed	6 <sup>th</sup> Ave Tower Level	$\geq 109.25$ (1428.2 ft)
NW Booster Pump Station		Downstream Pressure	53 psi

## **El Dorado Northeast Pressure Zone Evaluation**

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### **4.0 Distribution System Model**

A computer model of the City's existing distribution system was developed utilizing the WaterGEMS software program from Bentley Systems, Incorporated. The WaterGEMS program is a network model that allows the user to construct a graphical water distribution system and analyze the hydraulics with the program's algorithms. The program calculates theoretical system pressures at pipe junctions (nodes) for specific water demands and can estimate how a system operates over an extended period. The user can manipulate demands and other input parameters to model different usage conditions or improvements that are planned for the system. The water model is utilized as a tool to run complex hydraulic calculations, but engineers who are qualified and knowledgeable about the hydraulic system must provide proper judgment and critical thinking skills to verify the results of the model.

#### **4.1 Information Required**

The WaterGEMS model operates based on characteristics of each pipe, pump, and storage unit that is entered into the computer program. Parameters required for each pipe section include the diameter, length, and roughness coefficient. The roughness coefficient, or "C" value, is a measure of the relative roughness of the pipe. The rougher the interior of the pipe is, the more pressure loss that will occur as water travels through the pipe. The values are initially estimated during model development based on the type and age of the pipe and are modified during calibration.

Storage structures can include below grade reservoirs, at grade tanks or standpipes, or elevated tanks. Each storage structure is included in the model as a tank of a known diameter (or cross-sectional area) with a maximum water surface elevation, a minimum water surface elevation, and an assumed starting water surface elevation for model analysis. The head and flow conditions for each pump are modeled based on the manufacturer's pump curve. Additional system elements that can be analyzed by WaterGEMS include system isolation, pressure reducing, or flow control valves; fire hydrants; and system operational controls. The water model mimics the water distribution systems SCADA operational setpoints to operate pumps and monitor water tower/tank levels based on the controls outlined in Table 3-4.

#### **4.2 Model Development**

The computer model was developed utilizing GIS files and mapping information provided by the City. All pipes, hydrants, and valves were added to the model. All distribution system pumps were specified with design flow and head conditions, and the water towers were dimensionally specified.

## **El Dorado Northeast Pressure Zone Evaluation**

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### **4.3 Demand Distribution**

Demands are modeled by applying an outlet flow load to junctions (nodes) in the system. The total demand established for the current system and projected northeast pressure zone growth must be distributed among the model nodes to reasonably represent the actual allocation of demand throughout the City's system.

Concentrations of high demand were modeled as closely as possible to their actual location. Demands associated with the top 20 water users were included in the model on a single node near each user's meter. The remaining demand was evenly distributed throughout the system.

### **4.4 Model Calibration**

The model was calibrated using data collected from field flow testing to confirm that the model represents actual system conditions. PEC conducted field flow testing with City staff in November 2025 at the eleven locations shown in Figure 6.

There are two tests that can be performed at each location. The first test isolates a single water line from the system and measures the pressure loss through that section of pipe. This information is utilized to calculate the "C" value of that specific pipe. The first test is most effective for older pipe materials such as cast iron where there is significant pressure loss. It is not as effective at determining "C" values for newer plastic pipes because the pressure loss is low and challenging to accurately capture with field testing. Due to this, the first test was performed at only one of the flow testing locations.

The second test simply captures flow and pressure information, without any isolation, to be utilized during calibration. The water tower levels and booster pump flowrates were obtained for each location at the exact time of each test location.

Initial "C" values were defined to be universally accepted values for the various materials. Using the flow and tower level information, the pressure readings from the second test were then compared to the modeled pressure result to adjust the initial "C" values.

Through the calibration process, it was determined that the "C" values for all PVC pipe in the system should be 130, all ductile iron pipe should be 120, and all non-specified metal pipe (labeled SP in the model) should be 100. It should be noted that during calibration it was discovered that multiple valves in the system were closed. These closed valves were field verified by City staff. There may be additional closed valves in the system that were not located.

## El Dorado Northeast Pressure Zone Evaluation

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### 5.0 System Analysis

The model was evaluated under two operational conditions, Steady State Simulation (SSS) and Extended Period Simulation (EPS). The SSS is a snapshot evaluation of the system at a specific point in time. The model was analyzed for average day, maximum day, and peak hour demand conditions to assess the performance of the existing system. Available fire flows were evaluated under the MDD SSS.

An EPS was used to model how the system operates and behaves over a specified time frame. The EPS was conducted for a 72-hour time frame and 240-hour time frame with current demands using a standard American Water Works Association (AWWA) diurnal curve. This evaluates when the water storage tanks drain and fill, if there is sufficient storage provided, how often pumps operate to supply adequate flow and pressure, pump capacity, and water age.

Pumping system and water storage analyses were subsequently performed to determine if the system's existing pump capacity and storage capacity are adequate for current and projected northeast pressure zone demands.

#### 5.1 Existing Distribution System

The model was evaluated under the existing system conditions using current demands to determine existing deficiencies and problem areas.

##### 15.1.1 System Pressures – Existing Controls

Under ADD demands and current operational controls, system pressures range from approximately 27 psi (near Country Club Ln) to 65 psi (near Wetlands Dr) in the main pressure zone. In the west pressure zone pressures range from 48 psi (near W 6<sup>th</sup> Ave and NW Parallel St) to 73 psi (near W Central Ave and S Haverhill Rd).

Under MDD the pressure range drops slightly (by 1-2 psi) when compared to the ADD demand pressure range. Under PHD the lowest observed pressure drops to 22 psi. The ADD, MDD, and PHD pressure distributions are similar. The MDD pressure distribution is shown in Figure 7.

All observed pressures are above KDHE's minimum system pressure requirement of 20 psi. The lowest observed pressure for all demand conditions is above or equal to 22 psi. While the pressures meet the minimum requirements, pressures less than 40 psi often result in "low pressure" complaints from the system users.

## El Dorado Northeast Pressure Zone Evaluation

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### 5.1.2 Fire Flow Analysis – Existing Controls

The most strenuous demands on a distribution system are the flows required for fire suppression. Fire flows are applied in the model in addition to the MDD to simulate the worst-case scenario of a fire on a high water demand day. The maximum available fire flow is found at each hydrant to correspond with the minimum pressure at any location in the distribution system being equal to 20 psi per KDHE. The existing system was analyzed to determine the available fire flow at each system hydrant.

Typical fire flow requirements are 1,000 to 1,500 gpm for residential development, 1,500 to 2,000 gpm for commercial development, and 2,500 to 3,000 gpm for industrial development. Higher fire flows may be required on a case-by-case basis. For the purposes of this model analysis, the minimum fire flow required varies between 1,200 gpm and 3,000 gpm depending on the associated type of development.

Analysis of the model indicates that approximately 75% of the system hydrants can provide at least 1,200 gpm, 54% can provide at least 2,000 gpm, and 28% can provide at least 3,000 gpm under the current MDD. Only 1 hydrant in the system can provide less than 500 gpm of fire flow. Fire hydrants that did not meet flow requirements in the model are generally located on dead end lines or on small diameter pipes. The available fire flow based on current demands and controls is shown in Figure 8.

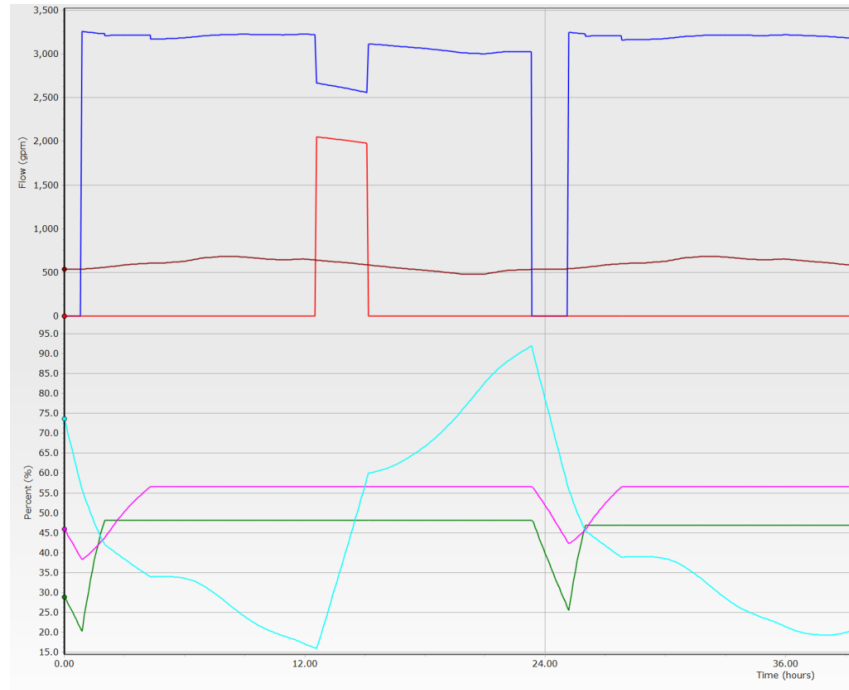
### 5.1.3 Extended Period Simulation

The model was evaluated under an Extended Period Simulation (EPS) for 72 hours using the current ADD and MDD. This simulation used the actual system controls to mimic how the system typically operates throughout the day. On a day-to-day basis, the system controls can be changed to meet the needs of the distribution system at any given time. Therefore, it is important to note that the controls used for the EPS do not account for this day-to-day variability and only utilize typical system controls.

The lowest and highest pressures in the system remained the same between MDD SSS and MDD EPS. Graph 5.1 shows the MDD EPS results for the system. The results show that the 6<sup>th</sup> Ave and McCollum towers fill to the altitude valve set points (between 45 – 60 % full) in the morning, and do not drain until the pumps are manually turned off at 6 am. Model controls struggle to mimic this manual operation for more than one day cycle, therefore Graph 5.1 only shows one 24 hr cycle of the EPS. The industrial tower drains to approx. 15% full during peak usage hours. Operating with the water towers at this low of levels has negative effects on system pressures, available fire flow, and overall system storage volume.

## El Dorado Northeast Pressure Zone Evaluation

**Figure B: Existing System MDD EPS Results**



- HSPS 1 - MDD EPS - Flow (Total)
- NW BPS - MDD EPS - Flow (Total)
- T-Industrial - MDD EPS - Percent Full
- HSPS 3 - MDD EPS - Flow (Total)
- T-6th Ave - MDD EPS - Percent Full
- T-McCollum - MDD EPS - Percent Full

### 5.1.4 Water Age

Water age refers to the length of time water has been in the system. Typically, the oldest water in the distribution system contains the highest levels of disinfection byproducts (DBPs) and the lowest chlorine residuals. DBPs are formed through naturally occurring reactions of the treated water with organic matter. DBPs can include Chloroform, Bromodichloromethane, Dibromochloromethane, and Bromoform which have been linked to adverse health effects. Analyzing water age is important so that system operation can be adjusted to reduce the levels of DBPs while maintaining an adequate chlorine residual.

Water age was evaluated using an EPS at the ADD for ten consecutive days (240 hours). As Figure 9 illustrates, the current water age is relatively high (168- 240 hours) in the areas surrounding 6<sup>th</sup> Ave and McCollum Towers. This high water age is likely due to the current operation of the towers only cycling 1-2 times per day.

## El Dorado Northeast Pressure Zone Evaluation

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### 5.3 Pumping System Analysis

The distribution system needs to have the ability to pump or otherwise supply water at adequate pressure to meet the MDD. The firm capacity of the City's pumps at the HSPS and the west pressure zone pump station was utilized to review the system's ability to pump water into the distribution system. Firm capacity typically assumes the largest pump is out of service.

The City's high service pumps at the WTP are able to adequately supply the overall current MDD (4.39 MGD) as they have a firm capacity of 8.64 MGD. The MDD of the west pressure zone is approximately 0.65 MGD. The west pressure zone booster pump station is able to adequately supply the zone MDD as they have a firm capacity of 5.76 MGD.

### 5.4 Water Storage Analysis

Adequate water storage can help regulate pressures in a distribution system. The water storage volume also provides flow equalization and storage for emergency use and fire flows. The existing water towers serve as the City's primary pump-independent storage unit for the system with a total volume of 1.25 MG, as previously shown in Table 3-1. With current controls, the towers are often operating at only partially full, so available storage volume at any given time may be significantly less.

#### 5.4.1 Flow Equalization Volume

Pump stations are designed to deliver the volume of water required to meet the MDD into the system. System storage provides the difference between the MDD volume and the peak hourly demand volume, which is the maximum quantity of water utilized during one hour of the day. Supplying this peak hour demand from source water pumping significantly increases the pump capacity needed for only a few hours a day. This operation is not efficient; thus, storage is utilized to provide this peak flow volume.

The required flow equalization volume can be determined through multiple methods. One method is to take the difference between water demand in the system and the water being supplied to the system. This method produces a volume specific to the system but requires hourly flow data from the time period with the highest demand. An alternative method is to assume an equalization volume based on a percentage of the MDD. Most water systems require a volume equal to 10% to 15% of the MDD. For this study, the volume required for equalization was calculated as 15% of the MDD to provide a conservative estimate.

## **El Dorado Northeast Pressure Zone Evaluation**

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### **5.4.2 Emergency Volume**

Emergency water storage may be required for a loss of water supply due to a water supply main failure, a power failure at the source water wells, or other catastrophic failures. The amount of water volume needed depends on the reliability of the distribution system and how quickly repairs can be made to place the system back into normal operation. The emergency storage volume is typically calculated as the volume corresponding to anywhere from 8 to 24 hours of MDD, depending on the estimated time to restore water supply. The existing system's WTP and HSPS has a backup power system which provides some reduction in rise. Therefore, for this study, a period of 8 hours was utilized to calculate the emergency storage volume.

### **5.4.3 Fire Protection Volume**

Fire protection volume is the amount of water storage needed to meet the desired fire demand flow for the system. The City mainly consists of residential users and a few prominent commercial user / industrial users. Based on current and future development, a fire flow of 2,000 gallons per minute (gpm) for a duration of 3 hours was utilized for the total system analysis, resulting in a required fire flow storage volume of 0.36 MG.

### **5.4.4 System Storage Analysis**

Two methods are commonly utilized to calculate the total elevated, or pump-independent, water storage volume recommended for a system. The first method is to assume a worst-case scenario by adding the flow equalization, emergency storage, and fire protection volumes together for the total needed volume. This method provides a very conservative estimate but also increases water age in the system since a much higher demand is needed for turnover.

The second and more common method is to add the emergency storage volume to the flow equalization volume and the fire protection volume to the flow equalization volume and utilize the higher resulting volume. This method is still conservative but reduces the amount of storage volume required while still providing an adequate volume in case of emergency. These two volume sums for the total system are shown in Table 5-1 and can be used to make storage capacity decisions for the overall system. Based on this analysis, the recommended storage for the system to meet 2025 demands is 2.12 MG. The largest contributor to this volume is the emergency volume. The existing total storage volume in the water towers of 1.25 MG does not provide this volume.

## El Dorado Northeast Pressure Zone Evaluation

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**Table 5-1: Recommended Total System Storage Volumes**

Year	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Equalization Volume (MG)	Emergency Volume (MG)	Fire Protection Volume (MG)	Sum of Equalization and Emergency Volume (MG)	Sum of Equalization and Fire Protection Volume (MG)
2025	3.16	4.39	0.66	1.46	0.36	2.12	1.02

## **El Dorado Northeast Pressure Zone Evaluation**

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### **6.0 Water Distribution System Recommended Improvements**

Recommendations for improvements to the existing system were made based on the current assessment of conditions.

One system deficiency identified was the operational controls of the pumps and elevated storage tanks. The low set points of the altitude valves at the McCollum and 6<sup>th</sup> Ave towers limits available storage capacity, lowers pressures in the surrounding areas, and limits available fire flow. It also limits the amount of water turnover in the towers. It is recommended that the City modify operations to the proposed controls identified in Section 6.1. The City has identified historical issues with water age and water quality within the 6<sup>th</sup> Ave tower when utilizing the full storage capacity. To address these concerns, it is recommended that an active or passive mixing system is installed. The mixing system will prevent stratification in the tank and the overall water age in the tank will be regulated by the control system.

Another system deficiency identified was from the water storage analysis. As shown in Section 5.4.4, 2.12 MG of total storage is recommended for the system based on the sum of Equalization and Emergency Volumes. In order to meet this volume, it is recommended to add a total of 1 MG of elevated storage to the system. It is recommended that 0.5 MG of the proposed storage is constructed in the west pressures zone to provide emergency / fire flow volumes to the zone and prepare for industrial growth. The remaining 0.5 MG is recommended to be constructed in the main / low pressure zone to help needed storage volumes in the main residential areas of the City.

The City has several 4-inch or smaller waterlines that are connected to fire hydrants. KDHE requires any waterlines connected to hydrant be a minimum of 6-inch in diameter. It is recommended to replace these 4-inch lines with 8-inch pipe to increase available fire flow and meet KDHE requirements. The area south of Central Ave between Poplar St and Washington St has the highest concentration of 4-inch lines and low available fire flows. It is recommended to start with replacing the 4-inch lines in this region. The City should consider main break history as high priority when evaluating which pipes to replace.

#### **6.1 System Analysis with Proposed Controls**

In order to avoid manual operation of the pumps, increase system pressures, and increase the available storage volume of the distribution system, it is recommended to implement new operational system controls. These controls will maintain the lead lag sequence of the HSPS pumps but increase the level of the McCollum and 6<sup>th</sup> Ave Towers altitude valve settings to allow more water into and out of those storage tanks to better facilitate tower cycling. The set points for the proposed controls are provided in Table 3-3.

## El Dorado Northeast Pressure Zone Evaluation

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**Table 6-1: Proposed System Control Set Points**

Element / Pump Station	Operation	Parameter	Level (Hydraulic Grade) /Downstream Pressure
WTP High Service Pump Station	Lead Pump On	Industrial Tower	<= 68.70 (1435.1 ft)
	Lead Pump Off	Industrial Tower	>= 77.70 (1444.1 ft)
	Lag Pump On	Industrial Tower	<= 62.70 (1429.1 ft)
	Lag Pump Off	Industrial Tower	>= 69.70 (1436.1 ft)
McCollum Altitude Valve	Valve Closed	McCollum Tower Level	>= 101.0 (1443.1 ft)
6 <sup>th</sup> Ave Altitude Valve	Valve Closed	6 <sup>th</sup> Ave Tower Level	>= 124.15 (1443.1 ft)
NW Booster Pump Station		Downstream Pressure	53 psi

### 6.1.1 System Pressures – Proposed Controls

The system pressures while utilizing proposed controls (see Section 3.7) were evaluated for existing ADD, MDD, and PHD demands. When utilizing the proposed controls, ADD system pressures ranged from 30 – 73 psi. Under PHD the lowest observed pressure drops to 28 psi. Overall, the proposed controls help maintain higher pressures throughout the system.

### 6.1.2 Fire Flow Analysis – Proposed Controls

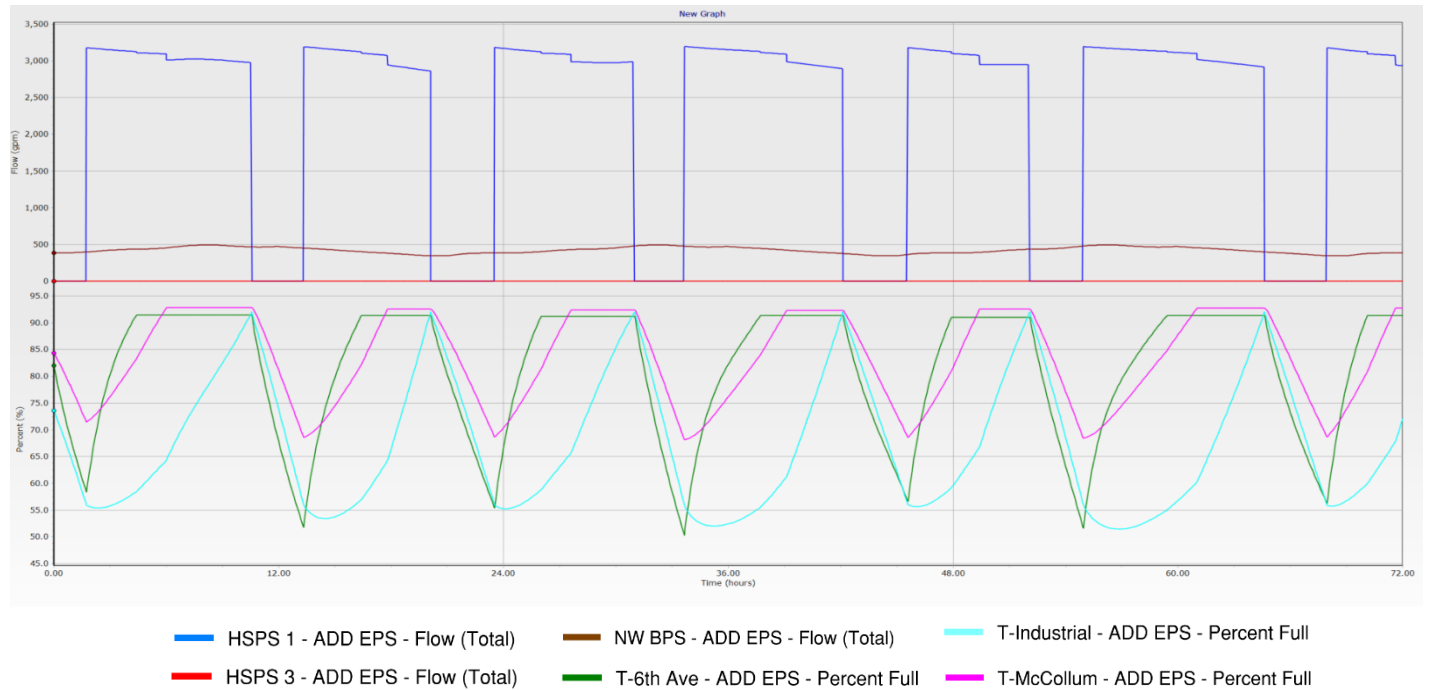
The existing system was analyzed to determine the available fire flow at each system hydrant utilizing the proposed system controls. Analysis of the model indicates that approximately 76% of the system hydrants can provide at least 1,200 gpm, 61% can provide at least 2,000 gpm, and 33% can provide at least 3,000 gpm under the current MDD. Only 1 hydrant in the system can provide less than 500 gpm of fire flow. Overall, the proposed controls increased available fire flows for hydrants throughout the system.

### 6.1.3 Extended Period Simulation – Proposed Controls

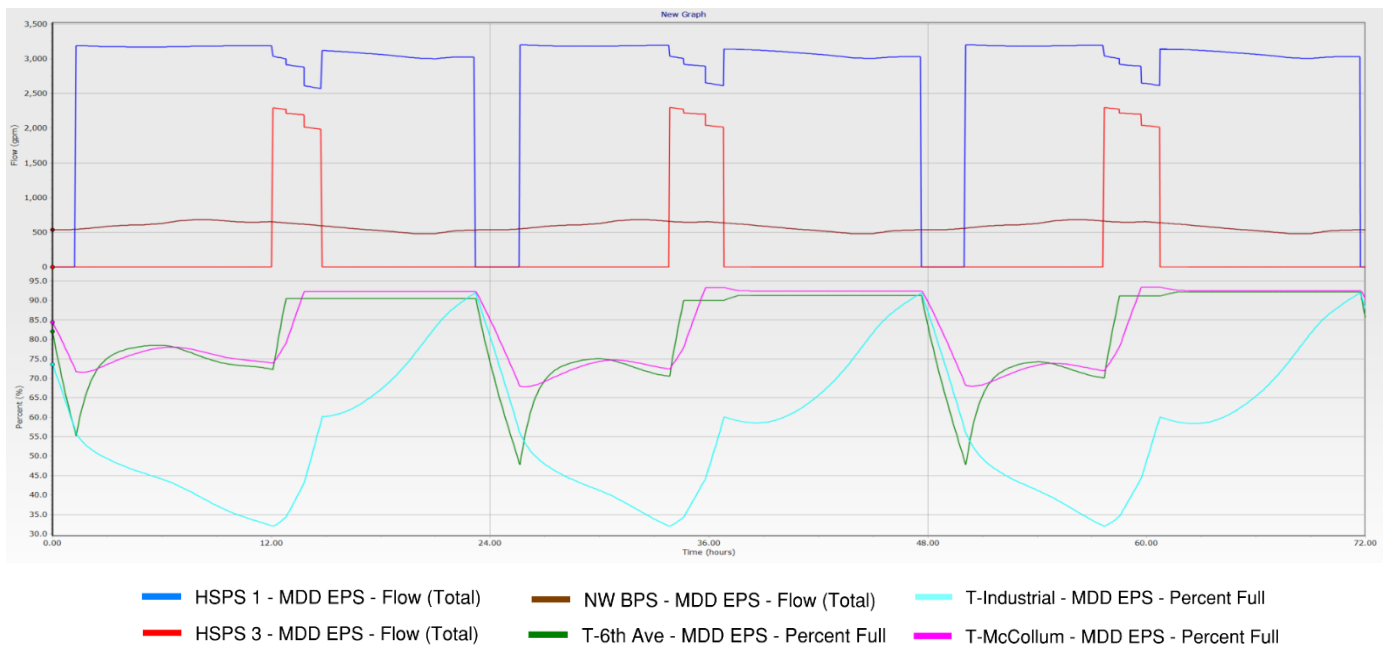
The model was evaluated under an Extended Period Simulation (EPS) for 72 hours using the current ADD and MDD with the proposed controls. The results for the ADD EPS and MDD EPS are shown in Figure C and D, respectively. As shown in Graph C, the water towers cycle 2-3 times per day between approximately 52-92% full under ADD.

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**Figure C: System ADD EPS Results with Proposed Controls**



**Figure D: System MDD EPS Results with Proposed Controls**



## **El Dorado Northeast Pressure Zone Evaluation**

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### **7.0 Northeast Pressure Zone Evaluation and Recommendations**

Projected development in the northeast region of the City will require the development of a Northeast Pressure zone to maintain adequate pressures and available fire flows in the system as the development occurs. In order to develop this pressure zone, a boundary must be established that separates service of this zone from the rest of the system. Pressures in the new zone will be maintained by a proposed booster pump station located near McCollum Tower.

#### **7.1 Zone Boundary Improvements**

The proposed boundary for the northeast pressure zone includes projected growth areas between McCollum Rd and NE 36<sup>th</sup> St, east of N Main St. The proposed boundary will also be drawn to include some existing residential areas. This area will include units east of Country Club Rd and north of Country Club Ln. The proposed boundary line for the northeast pressure zone is shown in Figure 10.

Piping improvements along McCollum Rd will be required to separate existing infrastructure from the proposed pressure zone. A 12-inch line should be installed from the booster pump station and connected to the existing 12-inch waterline at the NE corner of McCollum and Country Club Rd. The existing pipes crossing McCollum Rd at Bridgette D and Belmont Pkway intersections should be closed. A second new 12-inch line should also be connected to the 8" line crossing McCollum Rd to maintain flow to McCollum tower from the main pressure zone. Zone boundary improvements near McCollum Rd are shown in Figure 10.

Additional piping improvements along Country Club Rd will be needed to incorporate the existing residential area into the proposed zone. A new 8-inch waterline should be constructed along the east side of Country Club Rd between Rim Rock Rd and Country Club Ln. As this new line is constructed, connections should be made to the existing lines serving the areas east of Country Club Rd. Once the connections to the new 8-inch line are made, the waterlines crossing Country Club Rd should be closed.

The valve on the existing 12-inch east of Prairie Trails Golf and Country Club should also be closed to complete the isolation of the proposed zone. Closing this valve does convert the 12" line from the south into a dead-end line. To eliminate water age issues on this pipe and to utilize the hydraulic advantage this pipe provides, it is recommended to extend this 12" line north along the east side of the golf course and then west along McCollum Road all the way to the tower. Zone boundary improvements along Country Club Rd are shown in Figure 10.

## El Dorado Northeast Pressure Zone Evaluation

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A pressure relief/reduction valve is also recommended to be installed to allow flow to go from the NE Pressure Zone back into the Main Pressure Zone. Until a new tower in the NE Zone is constructed, this valve would help prevent pressure surges in the NE Zone. Once a new tower in the NE zone is constructed the valve would allow the storage to feed the Main Zone if needed in a fire or pipe break event.

### 7.2 Booster Pump Station

The northeast pressure zone booster pump station needs to have the ability to pump and supply water at adequate pressure to meet the projected MDD of the zone. As outlined in Table 2-3, the development of the northeast zone is projected to add a total average day demand of 1.05 MGD and a max day demand of 3.15 MGD.

Based on the projected zone demands it is recommended to install a booster pump station with five pumps. Pump 1 and 2 should be jockey pumps capable of providing the MDD of the existing residential areas in the zone. The existing residential area has an assumed flow of 0.27 MGD. The design flow of the jockey pump is recommended to be 190 gpm or 0.27 MGD to provide the needed flow. Two domestic pumps are recommended to meet the full projected average day demands of the northeast zone. The pumps are recommended to have a design flowrate of 750 gpm (1.08 MGD) to meet the projected ADD of 1.05 MGD for the zone. It is recommended to leave space in the pump station for a future third domestic pump. This would provide redundancy once the zone is fully developed. A fire flow pump is recommended to be able to provide commercial fire flows. The pump is recommended to have a design flowrate of 2,500 gpm (3.60 MGD) to provide adequate flow during max day fire flow scenarios.

The proposed pumps in the northeast zone are intended to operate with VFD's to maintain a set pressure of 70 psi at point just downstream of the pump station. It is recommended to include a pressure relief valve in the pump station design, so the jockey pumps do not have to operate below 70% speed. A summary of the proposed pumps for the northeast pressure zone booster station is summarized in Table 7-1.

**Table 7-1: Northeast Zone Booster Pump Station Design Points**

Pump Name	Design Flow (gpm)
NE Pump-1	190
NE Pump-2	190
NE Pump-3	750
NE Pump-4	750
NE Pump-5	2500

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### 7.3 Northeast Zone Storage Improvements

Storage analysis for the northeast zone was completed to determine the need for improvements. The recommended storage volume for the northeast zone is shown in Table 7-2. Based on the analysis it would be recommended to construct an additional 1.0 MG elevated storage tank in the northeast zone. Since additional storage without additional demand has a negative impact on water age, it is recommended to construct this tower when the average demand in the northeast pressure zone approaches 0.5 MGD.

**Table 7-2: Recommended Northeast Pressure Zone Storage Volumes**

Year	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Equalization Volume (MG)	Emergency Volume (MG)	Fire Protection Volume (MG)	Sum of Equalization and Emergency Volume (MG)	Sum of Equalization and Fire Protection Volume (MG)
2026	1.05	3.15	0.47	1.05	0.36	1.52	0.83

### 7.4 System Analysis with Northeast Zone Improvements

The system was analyzed for the effect of the northeast zone improvements on pressures, available fire flow, and EPS cycling of water towers and pumps. Demand was distributed to nodes throughout the northeast pressure zone to represent the projected additional 1.05 MGD to the ADD. Due to the additional demand, Pump 2 at the high service pump station was turned on. For simplicity, the pump was set to run constantly, but controls can be applied to the pump. The proposed piping improvements outlined in Section 7.1 were modeled for this analysis. The recommended additional storage in the northeast zone was not represented in the model.

Under ADD SSS operation system pressures ranged from 30 – 93 psi. The lowest observed pressures were near Industrial Tower, within the main pressure zone. The highest observed pressures were located along near N Main Street and E 30<sup>th</sup> Street in the NE pressure zone. Pressures in the existing residential area near McCollum Rd and Country Club Rd ranged between 60-75 psi with the northeast zone improvements. Under current conditions, the majority of pressures in this area are less than 40 psi.

Under MDD and PHD the pressure range drops slightly (by 1-2 psi) when compared to the ADD demand pressure range. The lowest observed pressure under PHD in the northeast zone was 43 psi, located in the far northeast corner of the zone. The ADD, MDD, and PHD pressure distributions are similar.

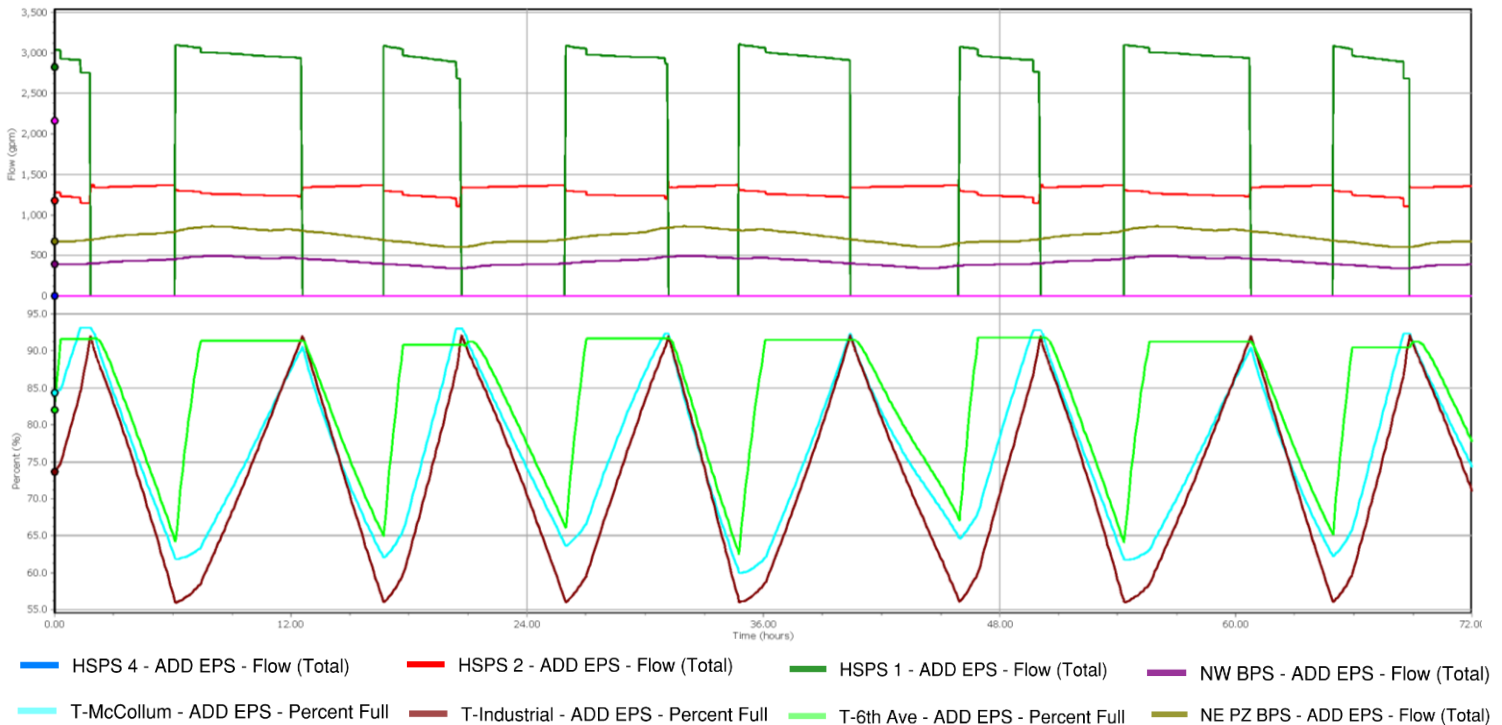
The system was analyzed to determine the available fire flow at each system hydrant. Analysis of the model indicates that approximately 92% of the system hydrants can provide at least 1,200

## El Dorado Northeast Pressure Zone Evaluation

gpm, 75% can provide at least 2,000 gpm, and 38% can provide at least 3,000 gpm under the current MDD. Only 1 hydrant in the system can provide less than 500 gpm of fire flow.

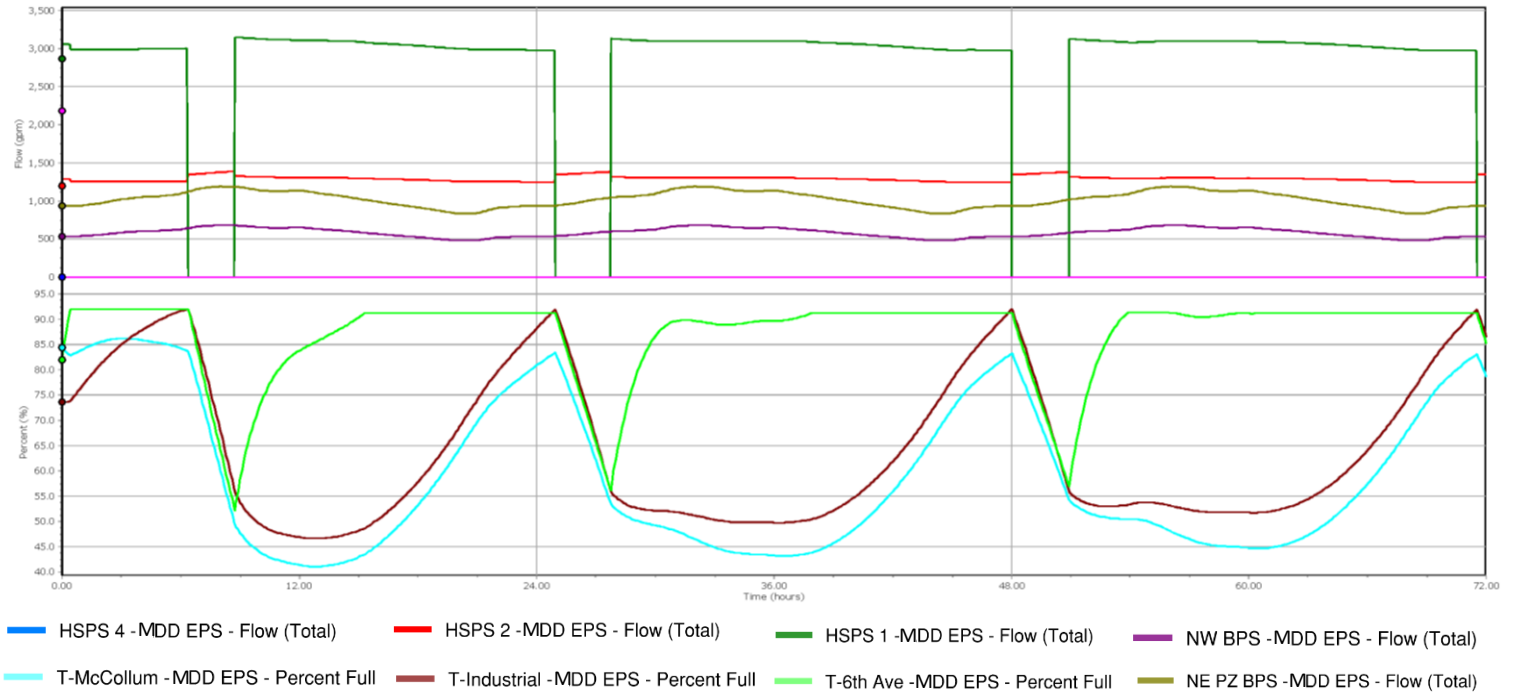
The model was evaluated under an EPS for 72 hours using the current ADD and MDD with the proposed controls. The results for the ADD EPS and MDD EPS are shown in Graphs 7.1 and 7.2, respectively. As shown in Graph 7.1, the water towers cycle 2-3 times per day under ADD conditions. Under MDD conditions McCollum tower operates between 40 – 80%. The pumping capacity of the HSPS is the limiting factor in allowing the McCollum tower to fully recover.

**Figure E: System ADD EPS Results with Proposed Controls**



## El Dorado Northeast Pressure Zone Evaluation

**Figure F: System MDD EPS Results with Proposed Controls**



## **El Dorado Northeast Pressure Zone Evaluation**

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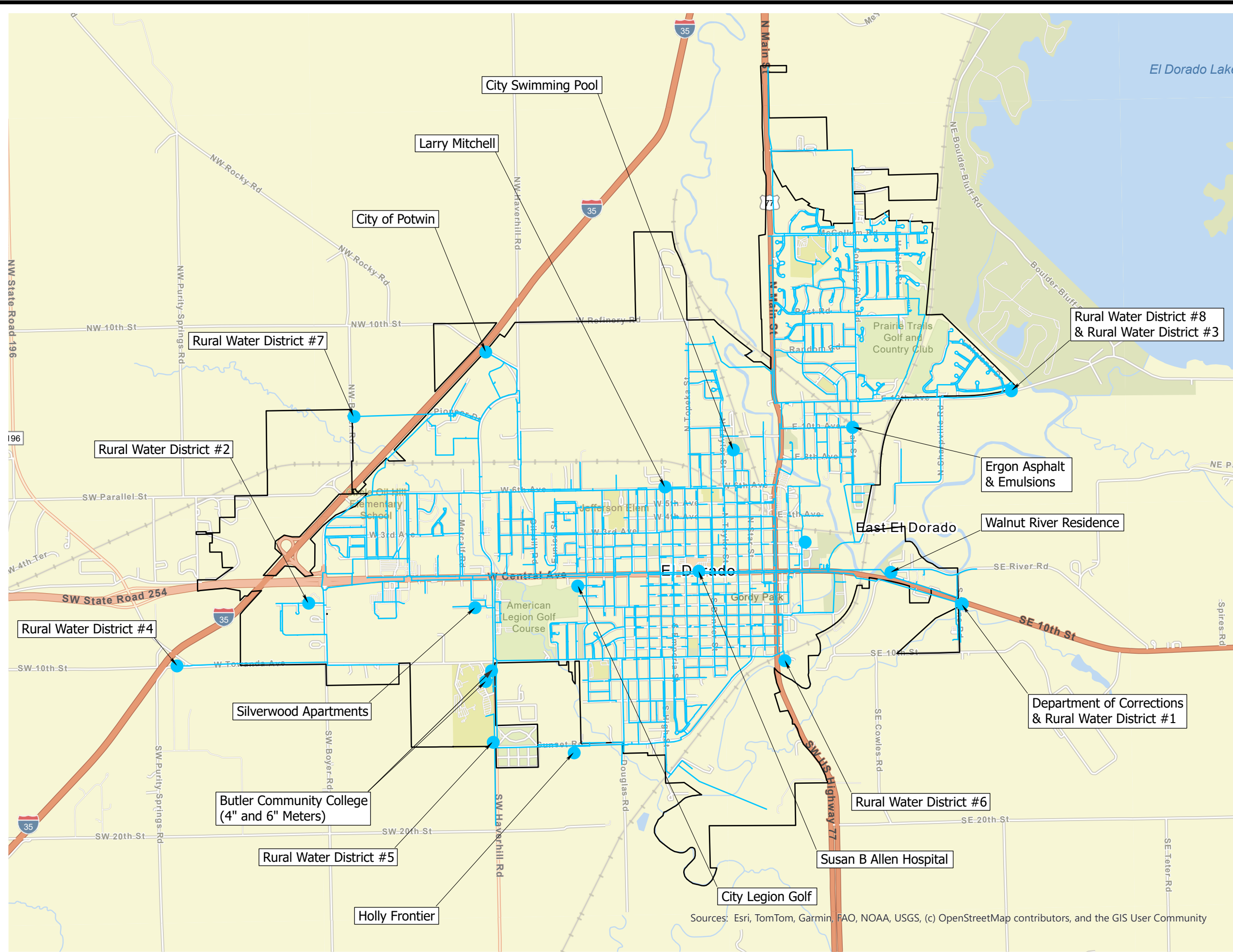
### **8.0 Water Distribution System Cost Estimates**

The estimated project costs for the existing system and NE pressure zone improvements are summarized in Table 8-1. The estimated costs are typical costs based on the type of work and on the engineer's opinion of probable cost. Actual cost will vary based on contractor availability and market conditions at the time of construction, outside of the control of PEC. A detailed cost estimate should be developed for each recommended project based on specific evaluation and site visits. To see a cost estimate breakdown of the recommended NE zone piping and pumps station improvements, refer to Appendix A.

**Table 8-1: Cost Estimates of Recommended Improvements**

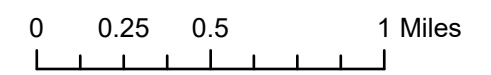
<b>Project Description</b>	<b>Project Cost</b>
NE Zone Piping and Pump Station Improvements	\$4,044,300.00
Future NE Zone 1.0 MG Elevated Storage Tank	\$7,000,000.00
0.5 MG Elevated Storage Tank – NW Zone	\$3,500,000.00
0.5 MG Elevated Storage Tank – Main Zone	\$3,500,000.00
6 <sup>th</sup> Ave Tower – Passive Mixing System	\$75,000.00

# Figures



### Legend

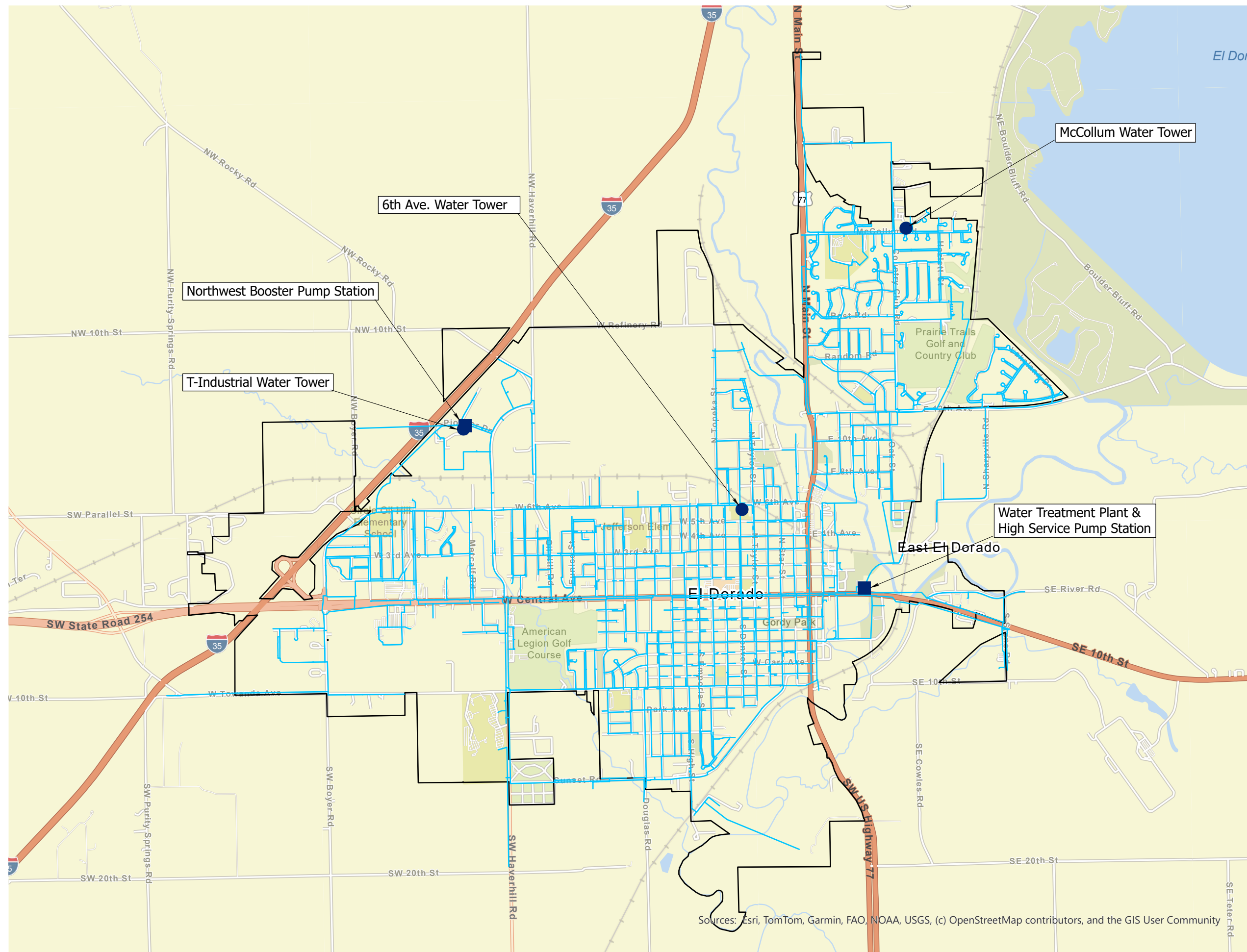
- Top 20 Water Users
- Existing Waterline
- City Limits



CITY OF EL DORADO  
**Figure 1 -  
 Top 20 Water Users**  
 El Dorado NE Pressure Zone Evaluation

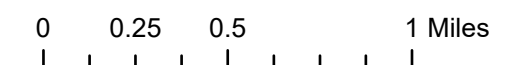
February 2026  
 Sht. 1 of 12

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community



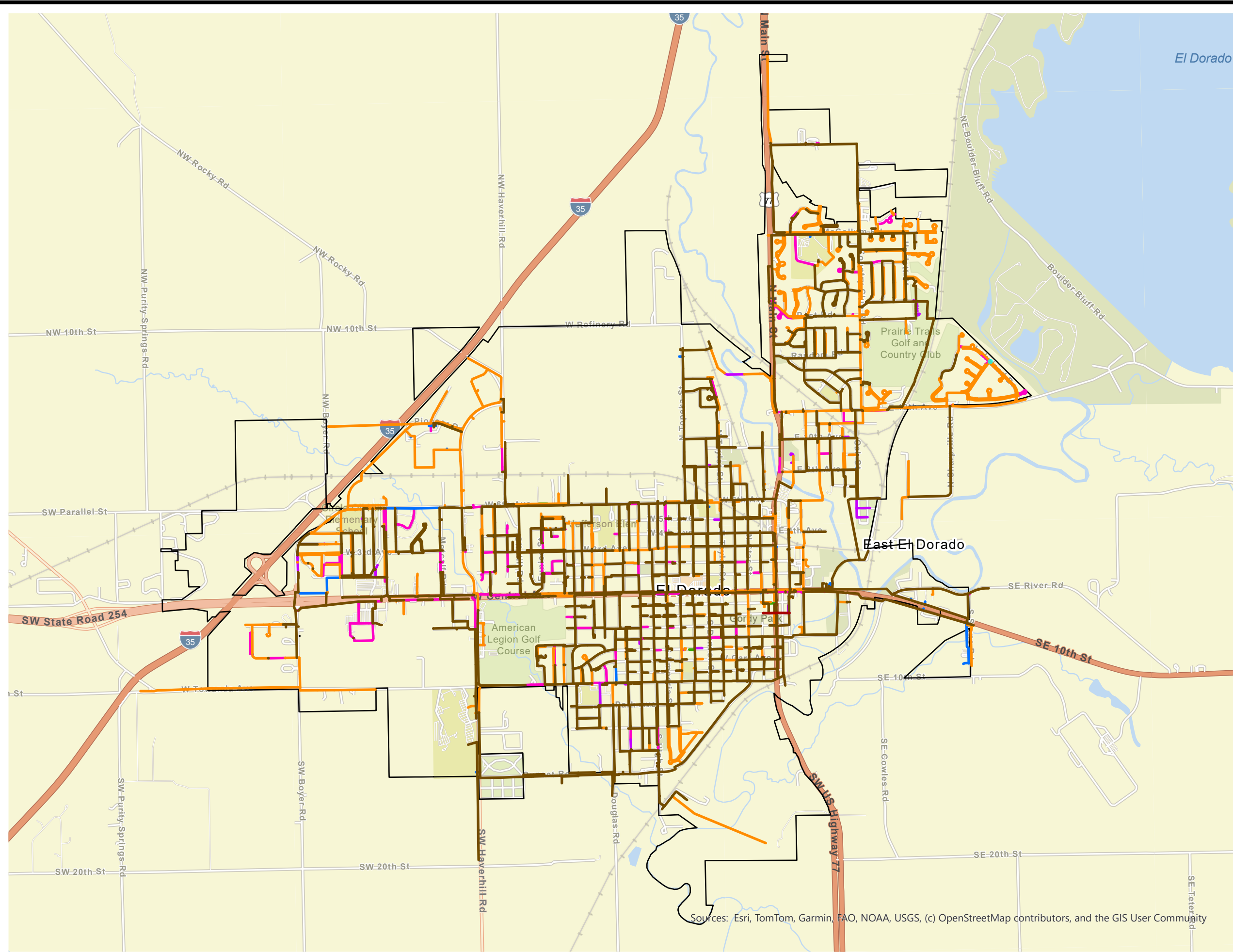
### Legend

- Booster Pump Station
- Storage Tank
- Existing Waterline
- City Limits



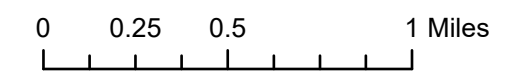
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

CITY OF EL DORADO	
<b>Figure 2 -</b>	
<b>Existing Water Distribution System</b>	
El Dorado NE Pressure Zone Evaluation	
	February 2026
Sht. 2 of 12	



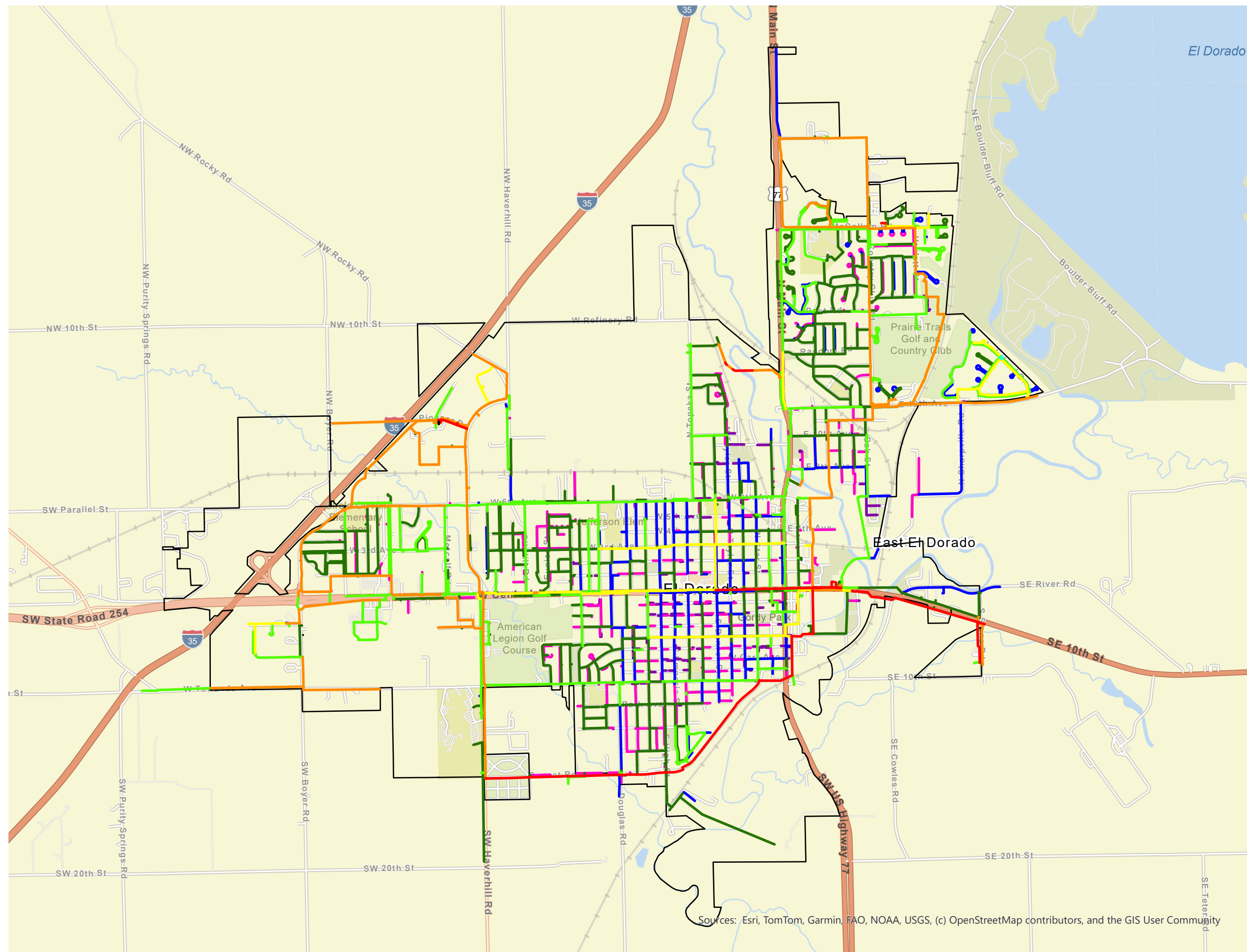
### Legend

- COP
- Ductile Iron
- PCCP
- PE
- PVC
- SB
- SP
- TTE
- City Limits



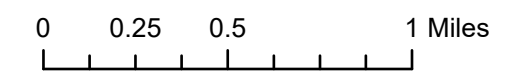
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

CITY OF EL DORADO	
<b>Figure 3 - Pipe Material</b>	
El Dorado NE Pressure Zone Evaluation	
	February 2026
Sht. 3 of 12	



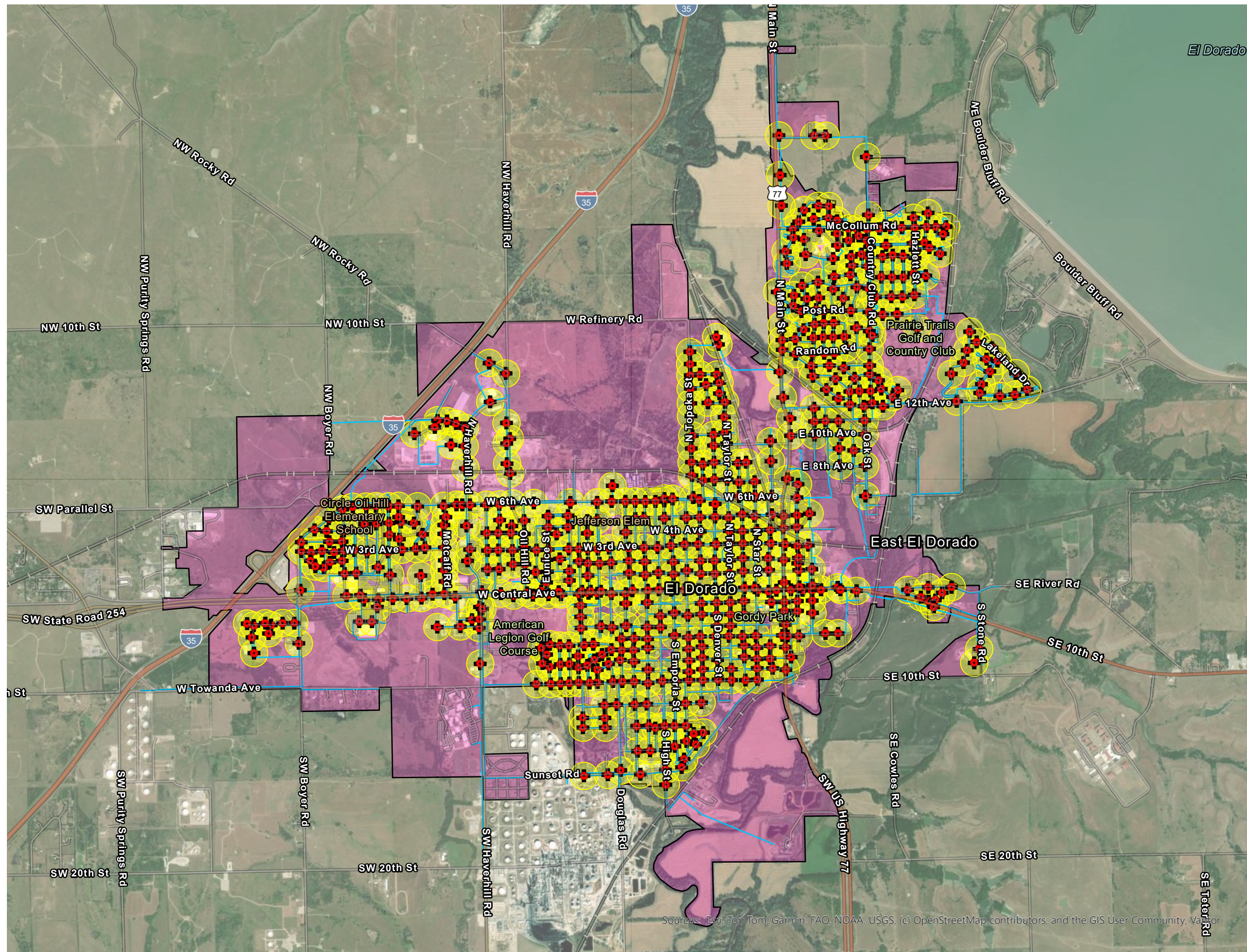
### Legend

- 1"
- 2"
- 4"
- 6"
- 8"
- 10"
- 12"
- 16"
- 24"
- City Limits

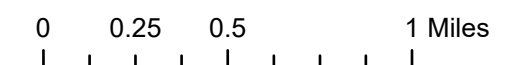


Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

CITY OF EL DORADO	
<b>Figure 4 - Pipe Size</b>	
El Dorado NE Pressure Zone Evaluation	
<b>EL DORADO</b> KANSAS	<b>PEC</b> PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
February 2026	Sht. 4 of 12



- Legend**
- + Hydrants
  - Existing Waterline
  - 400' (Radius) Fire Hydrant Coverage
  - City Limits
  - No Fire Hydrant Coverage Area within City Limits



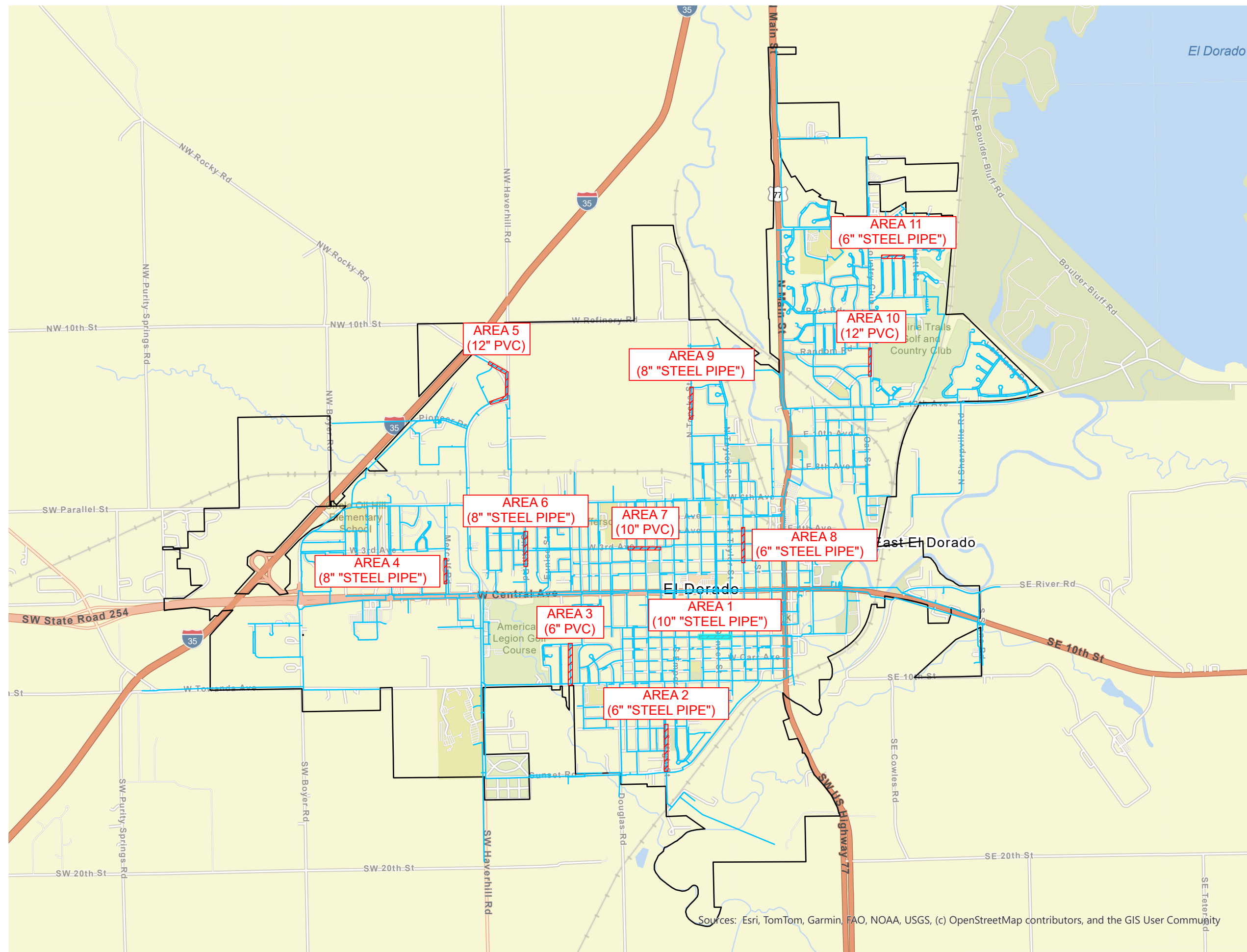
CITY OF EL DORADO

### Figure 5 - Fire Hydrant Coverage

El Dorado NE Pressure Zone Evaluation

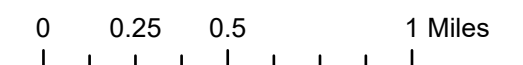
February 2026

Sht. 5 of 12



**Legend**

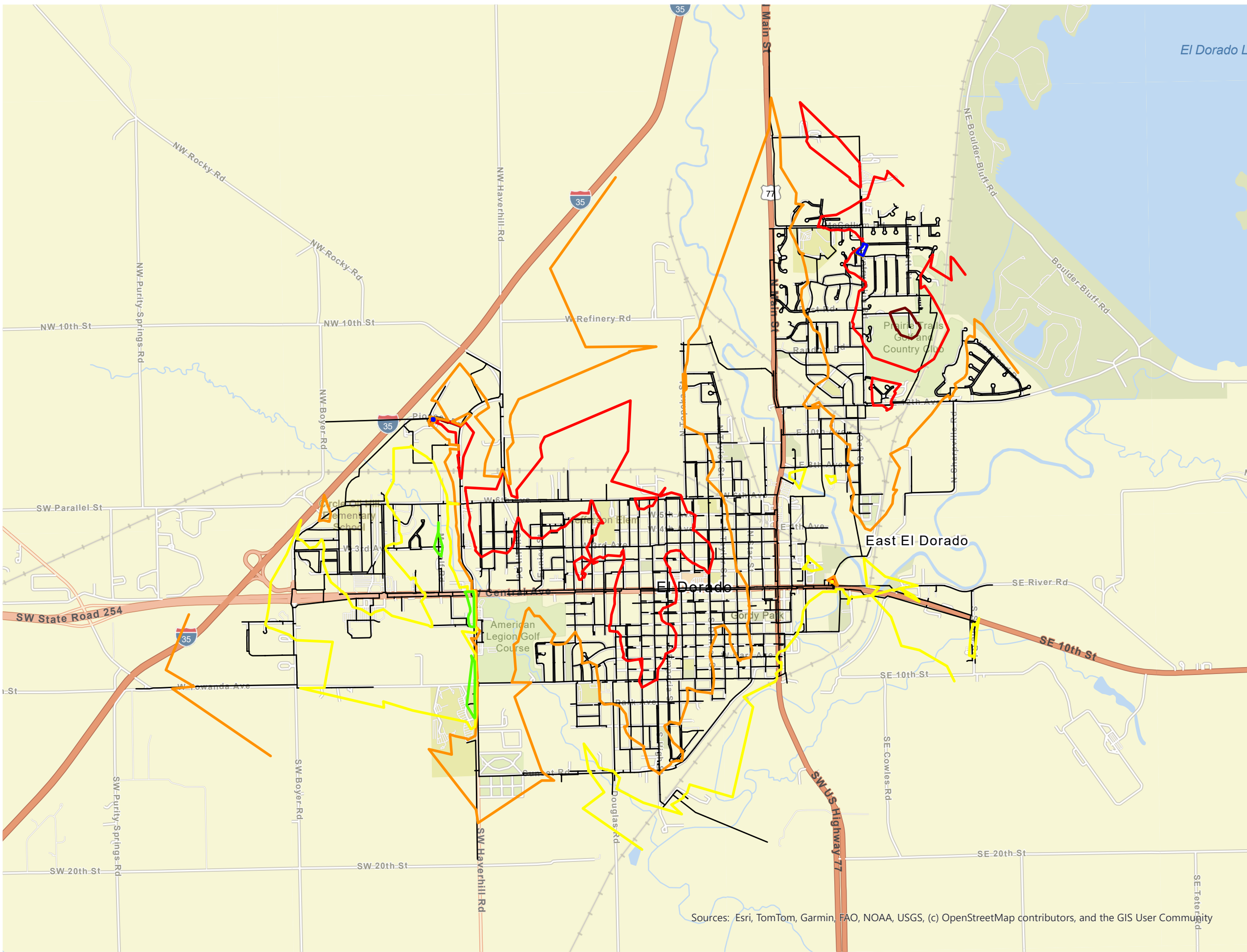
- City Limits
- Existing\_Waterlines
- Fire Hydrant Flow Test Location w/ ID



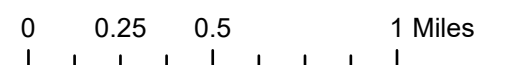
CITY OF EL DORADO  
**Figure 6 -**  
**Fire Hydrant Flow Test Locations**  
 El Dorado NE Pressure Zone Evaluation

	February 2026 Sht. 6 of 12
--	-------------------------------

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community



- ### Legend
- 30 PSI
  - 40 PSI
  - 50 PSI
  - 60 PSI
  - 70 PSI
  - 80 PSI
  - 90 PSI
  - Existing Waterline



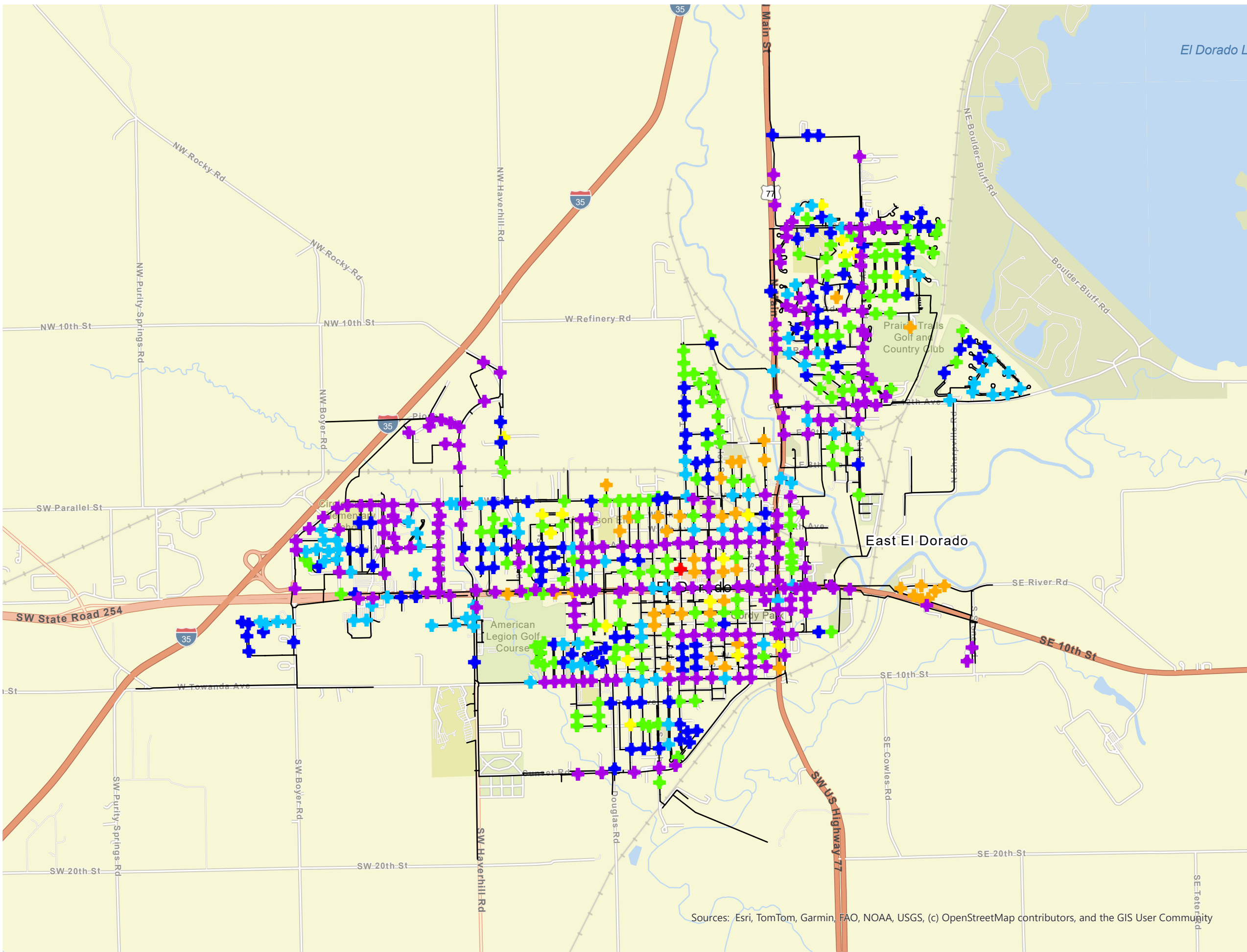
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

CITY OF EL DORADO

### Figure 7 - Existing 2026 Max Day Pressures

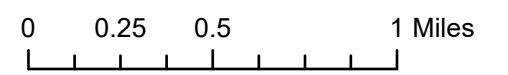
El Dorado NE Pressure Zone Evaluation

	February 2026 Sht. 7 of 12
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### Legend

- ★ <= 500 GPM
- ★ 501 - 1,000 GPM
- ★ 1,001 - 1,200 GPM
- ★ 1,201 - 2,000 GPM
- ★ 2,001 - 2,500 GPM
- ★ 2,501 - 3,000 GPM
- ★ >= 3,001 GPM
- Existing Waterline



CITY OF EL DORADO

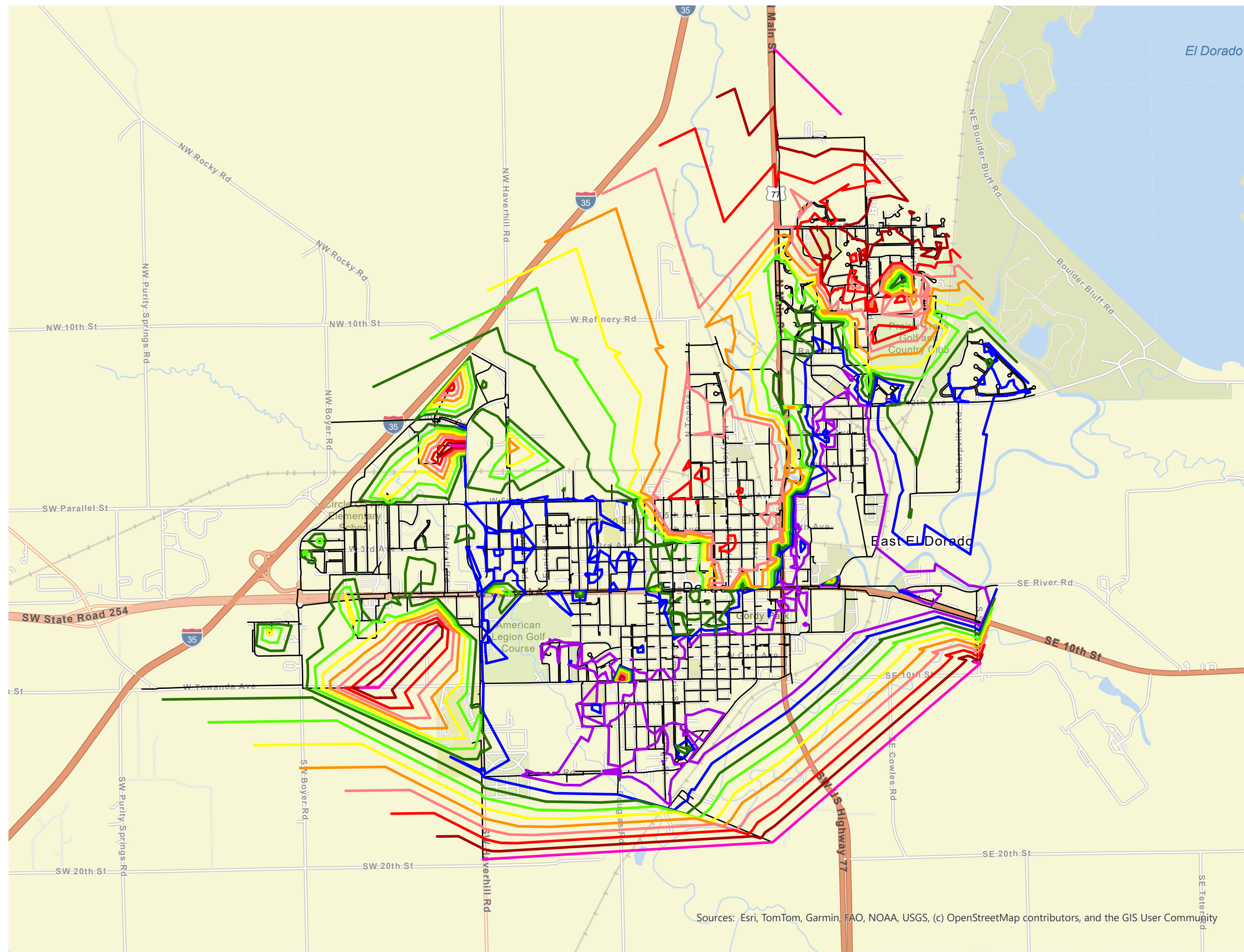
### Figure 8 - Existing 2026 Available Fire Flow

El Dorado NE Pressure Zone Evaluation

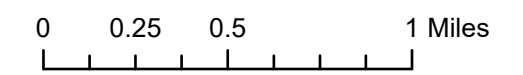
February 2026

Sht. 8 of 12

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community



- ### Legend
- 24 Hours
  - 48 Hours
  - 72 Hours
  - 96 Hours
  - 120 Hours
  - 144 Hours
  - 168 Hours
  - 192 Hours
  - 216 Hours
  - 240 Hours
  - Existing Waterline

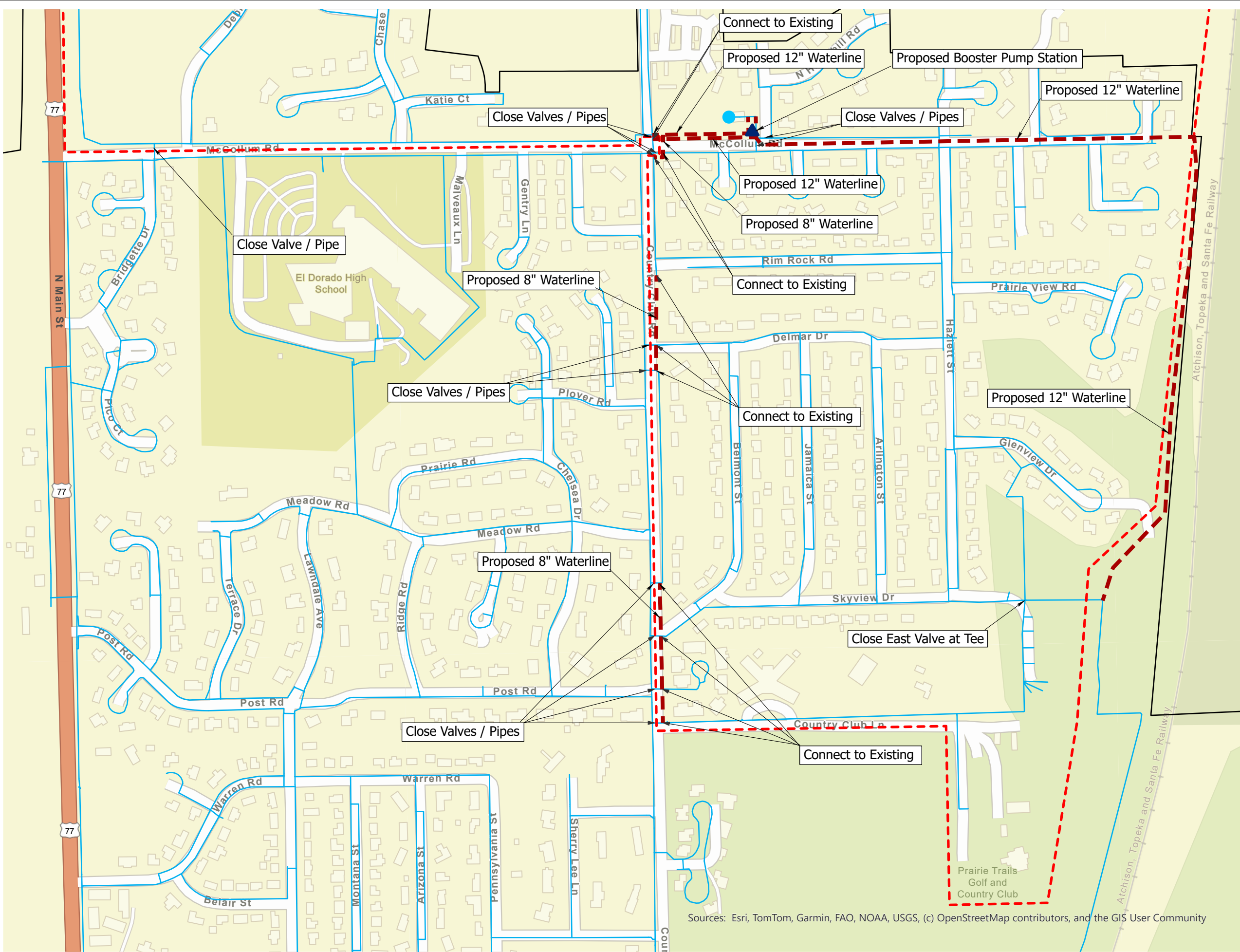


CITY OF EL DORADO  
**Figure 9 -**  
**Existing 2026 Water Age**  
 El Dorado NE Pressure Zone Evaluation

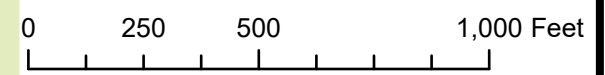
February 2026

Sht. 9 of 12

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community



- ### Legend
- ▲ Proposed Booster Pump Station
  - Proposed Waterlines
  - Proposed Pressure Zone Boundary
  - Existing Water Tower
  - Existing Waterline
  - City Limits

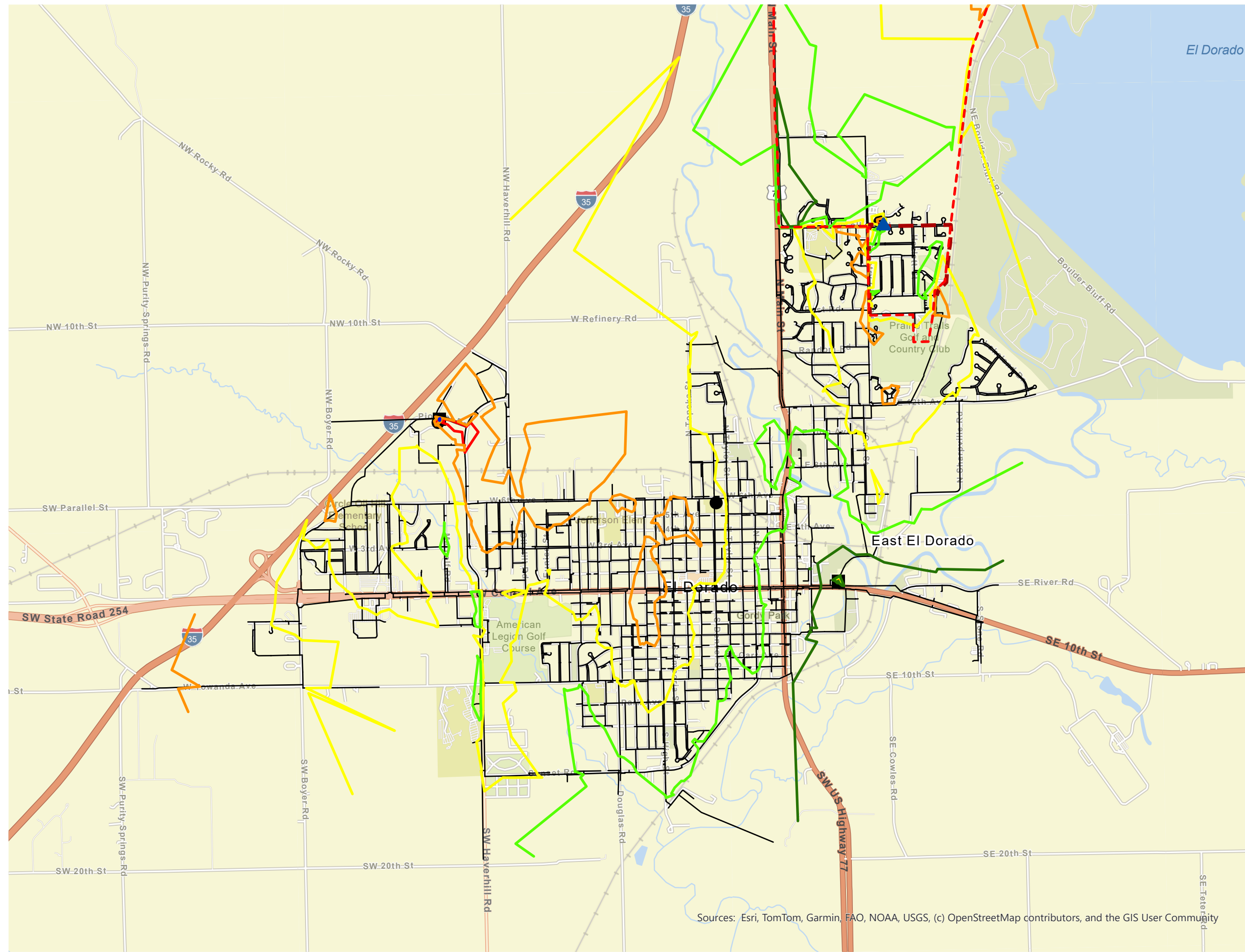


CITY OF EL DORADO  
**Figure 10 -**  
**Proposed Improvements**  
 El Dorado NE Pressure Zone Evaluation

February 2026

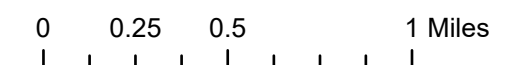
Sht. 10 of 12

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community



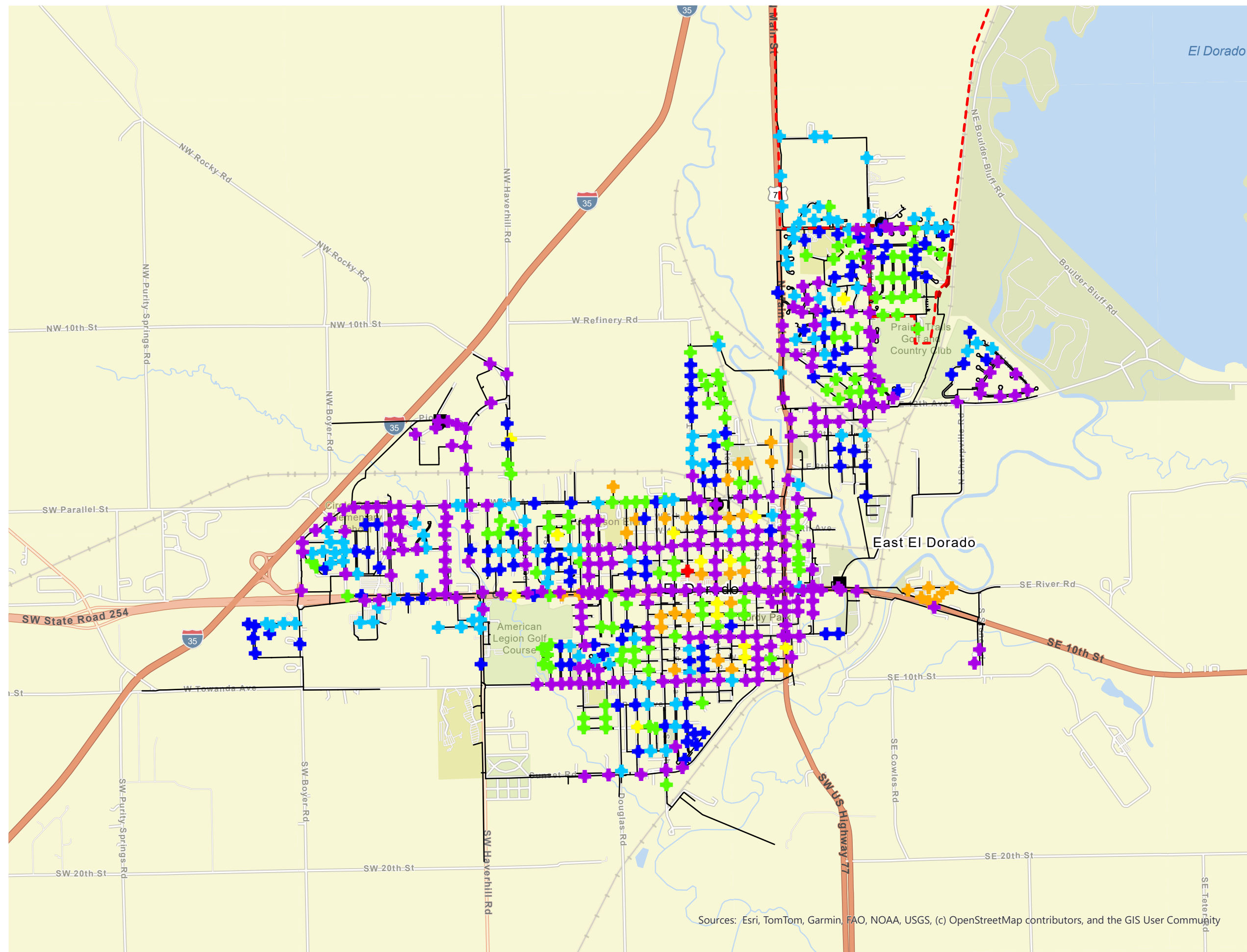
**Legend**

- ▲ Proposed Booster Pump Station
- Proposed Pressure Zone Boundary
- Proposed Waterlines
- 30 PSI
- 40 PSI
- 50 PSI
- 60 PSI
- 70 PSI
- 80 PSI
- 90 PSI
- Existing Water Tower
- Existing Booster Pump Station
- Existing Waterline

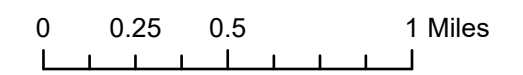


Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

CITY OF EL DORADO	
<b>Figure 11 -</b>	
<b>Proposed Maximum Day Pressures</b>	
El Dorado NE Pressure Zone Evaluation	
	February 2026
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- Legend**
- ★ ≤ 500 GPM
  - ★ 501 - 1,000 GPM
  - ★ 1,001 - 1,200 GPM
  - ★ 1,201 - 2,000 GPM
  - ★ 2,001 - 2,500 GPM
  - ★ 2,501 - 3,000 GPM
  - ★ ≥ 3,001 GPM
  - ▲ Proposed Booster Pump Station
  - - - Proposed Pressure Zone Boundary
  - - - Proposed Waterlines
  - Existing Water Tower
  - Existing Booster Pump Station
  - Existing Waterline



CITY OF EL DORADO  
**Figure 12 -**  
**Proposed Available Fire Flow**  
 El Dorado NE Pressure Zone Evaluation

February 2026

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Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

# **Appendix A**

## **Cost Estimates**

OWNER: City of El Dorado  
 PROJECT: NE Pressure Zone Improvements  
 PEC PROJECT NO: 250458-000  
 DATE: 3/9/2026



ITEM NO.	DESCRIPTION	QUANTITY	UNIT	ENGINEER'S OPINION OF PROBABLE COST	
				UNIT PRICE	COST
<b>CONCEPT ESTIMATE - NE ZONE IMPROVEMENTS</b>					
1	8" WL Pipe	970	LF	\$ 80.00	\$ 77,600.00
2	8" WL RJ Pipe by Directional Drill	220	LF	\$ 120.00	\$ 26,400.00
3	12" WL Pipe	4,090	LF	\$ 100.00	\$ 409,000.00
4	12" WL RJ Pipe by Directional Drill	1,000	LF	\$ 140.00	\$ 140,000.00
5	Connect to Existing WL	14	EA	\$ 3,500.00	\$ 49,000.00
6	8" Valve Assembly	4	EA	\$ 4,500.00	\$ 18,000.00
7	12" Valve Assembly	2	EA	\$ 5,500.00	\$ 11,000.00
8	Fire Hydrant Assembly	1	EA	\$ 6,500.00	\$ 6,500.00
9	VFD Pump Station	1	LS	\$ 1,500,000.00	\$ 1,500,000.00
10	Earthwork, Pavement, and Site Improvements	1	LS	\$ 50,000.00	\$ 50,000.00
11	Electrical and Controls	1	LS	\$ 200,000.00	\$ 200,000.00
12	Site Clearing and Restoration	1	LS	\$ 25,000.00	\$ 25,000.00
13	Mobilization	1	LS	\$ 50,000.00	\$ 50,000.00
14	Erosion Control	1	LS	\$ 10,000.00	\$ 10,000.00
15	Temporary and Permanent Seeding	1	LS	\$ 10,000.00	\$ 10,000.00
16	Construction Staking	1	LS	\$ 10,000.00	\$ 10,000.00
<b>SUBTOTAL CONSTRUCTION</b>				<b>\$</b>	<b>2,592,500.00</b>
<b>CONTINGENCIES</b>			<b>20.0%</b>	<b>\$</b>	<b>518,500.00</b>
<b>TOTAL CONSTRUCTION</b>				<b>\$</b>	<b>3,111,000.00</b>
<b>PROJECT COSTS</b>			<b>30.0%</b>	<b>\$</b>	<b>933,300.00</b>
<b>PRELIMINARY ENGINEERING (PE)</b>			<b>10.0%</b>	<b>\$</b>	<b>311,100.00</b>
<b>CITY FINANCING/LEGAL/ADMIN</b>			<b>7.5%</b>	<b>\$</b>	<b>233,325.00</b>
<b>CONSTRUCTION ENGINEERING (CE)</b>			<b>12.5%</b>	<b>\$</b>	<b>388,875.00</b>
<b>TOTAL PROJECT COST</b>				<b>\$</b>	<b>4,044,300.00</b>