AGENDA

Fort Smith Board of Directors
STUDY SESSION
February 10, 2026 ~ 6:00 p.m.
Blue Lion
101 North 2nd Street - Back Room
Fort Smith, Arkansas

THIS MEETING IS BEING TELECAST LIVE AT THE FOLLOWING LINK:
https://fortsmithar.granicus.com/ViewPublisher.php?view_id=1

CALL TO ORDER

ITEMS OF BUSINESS

1. Discuss reinstatement of the Spay or Neuter Voucher Program for 2026 ~ *C.Catsavis/G.Catsavis placed on future study session agenda at the January 27, 2026 study session; C.Catsavis/Rego placed on agenda (relocated from February 24, 2026 study session agenda) at the February 3, 2026 regular meeting ~ (City Administrator)*

2. Discuss proposed ordinance establishing accountability, disclosure, and standards for third party intermediaries in City transactions ~ *C.Catsavis/Martin placed on agenda at the January 27, 2026 study session ~ (City Administrator)*

3. Review 2025 Carryover and Carryforward requests *(Finance)*

4. Annual review of City auto and property insurance *(March 2026 - February 2027) (Finance)*

5. Discussion regarding comprehensive plan to address water infrastructure ~ *Requested by Director C. Catsavis at the September 2, 2025 regular meeting ~ (Engineering)*

♦

6. Review CIP for Water Systems Maintenance and Improvements 2026-2035 ~ *Resolution defeated at the December 2, 2025 regular meeting ~ (Engineering)*

7. Review preliminary agenda for the February 17, 2026 regular meeting *(City Clerk)*

CITIZENS FORUM

ADJOURN

MEMORANDUM

TO: Honorable Mayor and Members of the Board of Directors

CC: Danny Baker, Police Chief

FROM: Jeff Dingman, Acting City Administrator

DATE: February 5, 2026

SUBJECT: Spay/Neuter Vouchers for 2026

SUMMARY

Board members requested a discussion related to possible appropriation of funds to the 2026 operating budget for the purpose of continuing the animal spay/neuter voucher program for 2026. That discussion is scheduled for the February 10 study session.

The spay/neuter voucher program was authorized by Ordinance No. 8-24 (attached). Clinics that offer services can register to participate in the program. The vouchers are available to Fort Smith residents who self-verify that they meet the income requirements through the city website and can be redeemed at participating clinics. A city resident can bring their pet to the clinic and redeem their $100 voucher toward spay/neuter services for their pet. The voucher can also cover the cost of rabies vaccination and microchipping, as long as total services don't exceed $100 (or the resident pays any amount above $100).

The city initially appropriated $150,000 in the 2024 operating budget for this program. Those funds exhausted quickly, and the city appropriated an additional $75,000 for a total of $225,000 in 2024. The program continued in 2025 with another $150,000 for a total investment of $375,000 (actual spend was $378,940) over the two-year span. All funds for the program have been expended. In 2025 the funding was exhausted by the end of August. Data showing metrics for the program in 2024 & 2025 is attached.

Funds were not included in the operating budget for the voucher program in 2026. This item was reviewed at the November 17 budget meeting, and funding for the program was ultimately not included in the 2026 operating budget. Recent feedback from the community has led to the Board requesting a study session discussion on this item.

Please contact me with questions on this agenda item.

ATTACHMENTS

1. ORD 824 adopted 1182024.pdf
2. R-8-24.pdf
3. Spay & Neuter Voucher - 2024 - DATA.pdf
4. Spay & Neuter Voucher - 2025 - DATA.pdf

ORDINANCE NO. 8-24

ORDINANCE AMENDING THE CITY OF FORT SMITH ANIMAL REGULATIONS (2023 EDITION) AND ADOPTING OTHER PROVISIONS RELATING THERETO

BE IT ORDAINED AND ENACTED BY THE BOARD OF DIRECTORS OF THE CITY OF FORT SMITH, ARKANSAS, THAT:

Section 1. Section 4-108(f) of the City of Fort Smith Animal Regulations (2023 Edition) as adopted by the Ordinance No. 35-23 and amended by Ordinance No. 37-23 is hereby amended to read as follows:

> The city may make available vouchers toward the spay or neuter of dogs or cats. Animal owners may request such vouchers from the Chief of Police (or designee) which shall distribute any available vouchers on a first come, first served bases, limited to four vouchers per household per calendar year through December 31, 2026, and after such time shall be limited to one voucher per household per calendar year. The number and amount of vouchers may vary from year to year depending upon funds available and budgeted for such purpose.
>
> (1) Upon providing sufficient proof of residency and income, any qualified resident of the City of Fort Smith may obtain from the Chief of Police (or designee) a voucher toward the cost of sterilization surgery performed within the corporate boundaries of the city by a participating veterinarian or animal organization with surgical capabilities for an animal owned by the resident.
>
> (2) To be eligible for the voucher, the owner must provide proof that the animal is microchipped and has a current rabies vaccination. If microchipping and rabies vaccination are needed, such specific procedures may be included in the service cost covered by the city's voucher for sterilization procedure.
>
> (3) The City's voucher shall only apply to the sterilization procedure, microchipping (if needed) and rabies vaccination (if needed). No additional services will be covered by the City's voucher.
>
> (4) The specific policies, qualifications, requirements, allocations, processes or other items related to the voucher program shall be established and updated from time to time by resolution of the Board of Directors.

Section 2. All ordinances in conflict with the provisions of this ordinance are hereby repealed to the extent required to resolve such conflict.

Section 3: The codifier of the City's ordinances shall codify the provisions adopted hereby as Section 4-108(f) of the City of Fort Smith Animal Regulations (2023 Edition).

PASSED AND APPROVED THIS 18th day of January, 2024

APPROVED:

MAYOR

ATTEST:

CITY CLERK

Approved as to form:

City Attorney
Publish (1) Time

RESOLUTION NO. R-8-24

RESOLUTION ESTABLISHING A VOUCHER SYSTEM FOR THE SPAY OR NEUTER OF DOGS AND CATS FOR QUALIFIED RESIDENTS OF THE CITY OF FORT SMITH

WHEREAS, the City of Fort Smith recognizes the importance of controlling the pet population within its boundaries and promoting responsible pet ownership;

WHEREAS, to this end, the City of Fort Smith may make available vouchers to assist pet owners in the sterilization of their pets, subject to available funds.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE CITY OF FORT SMITH, ARKANSAS, that the terms and conditions of the voucher program are as follows:

SECTION 1. Voucher Distribution and Value:

a. Vouchers shall be made available on a first-come, first-served basis, with each voucher being good for $100 toward spay or neuter procedures.
b. A limitation of 4 vouchers per household per calendar year shall apply.
c. The number of available vouchers may vary annually based on funds available and budgeted.

SECTION 2. Eligibility Criteria:

a. Any qualified resident of the City of Fort Smith, upon verifying proof of residency and certain income requirements, may obtain a voucher to be used within the corporate boundaries of the city by a participating veterinarian or animal organization with surgical capabilities.
b. Income requirements for the sterilization voucher follow the financial eligibility guidelines set by Project Concern (City of Fort Smith's utility assistance program)—that is, gross household income must not exceed 165% of the current federal poverty guidelines.
c. The animal owner must provide proof that the animal is microchipped and has a current rabies vaccination before the sterilization procedure. If microchipping and/or rabies vaccination are required, the City's voucher shall only apply to the sterilization procedure, rabies vaccination, and microchipping. Only microchipping, rabies vaccination, and the sterilization procedure are covered by the $100 voucher.

SECTION 3. Voucher Form:

a. The voucher process shall consist of an online process which may be offered via website, mobile device application, or other effective methods.
    i. Through this online process, citizens must self-verify their income and must supply proof of residency to qualify for the voucher.

ii. The resident will show proof of their voucher to the participating veterinary clinic.
iii. Each participating clinic will verify the voucher, check the identification of the owner to verify residency, document the details of the animal involved and services provided, and provide proof of the sterilization surgery performed to the City for reimbursement. Only costs for the sterilization procedure, rabies vaccination (if needed), and microchipping (if needed) will be reimbursed.

b. The city will reimburse at the rate of $100 for each properly documented sterilization voucher, to which participating veterinarians or clinics will agree via a service provider agreement.

SECTION 4. Approval and Authorization of Service Provider Agreement:

a. The Public Services Agreement, as attached to this resolution, is hereby approved.
b. The City Administrator is authorized to execute the Public Services Agreement with participating veterinarians and animal organizations.
c. This authorization enables the City Administrator to sign the Public Service Agreements on behalf of the City, ensuring the efficient implementation of the voucher system.
d. The Public Service Agreement outlines the terms and conditions under which services will be rendered, including but not limited to, reimbursement rates, reporting requirements, and the scope of services.

ADOPTED THIS 18th **DAY OF,** Jan. **2024.**

APPROVED:

MAYOR

ATTEST:

Sherri Gard

CITY CLERK

Approved as to Form:

Publish One Time

PUBLIC SERVICES AGREEMENT

On this _____ day of _____, 2024 (the Effective Date) this Agreement is entered into between the City of Fort Smith, Arkansas (the City) and _____, a duly certified provider of veterinary medical care and services in the State of Arkansas, for participation in the City's Voucher Program for spay and neuter services.

WHEREAS, the City adopted by Ordinance No. 35-23 a requirement to spay and neuter pet dogs and cats; and

WHEREAS, the City offers a voucher program to incentivize and assist residents to spay and neuter their pet dogs and cats; and

WHEREAS, Resolution No. _____ provides details and establishes policies for how the voucher program is to operate; and

WHEREAS, certified veterinary medical professionals providing spay and neuter services, taking vouchers for such services, and billing the City for the number of vouchers collected are a vital part of controlling the pet population in the City of Fort Smith.

NOW, THEREFORE, the parties, in consideration of the terms, covenants, and conditions as set forth herein, hereby agree as follows:

1. SCOPE OF SERVICES to be provided by the Provider for regular sterilization services (not TNR) include:

    a. Verify by checking a state-issued government identification card, a copy of the City of Fort Smith utility bill, or other means that a person attesting to qualify for a City of Fort Smith pet sterilization voucher is a resident of the City of Fort Smith.

    b. Accept as payment for services City of Fort Smith vouchers in digital format.

    c. Perform spay and neuter services for pet dogs and cats, employing all necessary and prudent veterinary medical services required to accomplish such tasks.

    d. Only in conjunction with a sterilization procedure, perform rabies vaccination (if needed) and microchip services (if needed) for pet dogs and cats, employing all necessary and prudent veterinary services required to accomplish such tasks.

    e. Keep accurate records of the dogs and cats on which services are performed. Submit records and receipts to the City of Fort Smith on a timely basis for reimbursement.

2. COMPENSATION and METHOD OF PAYMENT

a. The total amount to be paid to the Provider in return for each regular voucher fulfilled under this agreement will be $100 per animal.

b. The Provider shall invoice the City of Fort Smith regularly for the compensation amount, at which time the city shall process payment according to its normal processes.

c. Provider shall register as a Vendor with the City.

3. TERM of AGREEMENT

a. The term of this Agreement shall be from the effective date through the end of the current calendar year, December 31, 2024.

b. This agreement shall automatically renew for up to two one-year periods unless terminated by either party by providing written notice at least thirty (30) days before the end of the then-current period. Extension of the arrangement beyond the second renewal period must be formally evaluated and approved by both parties.

c. Termination. Either party may terminate this agreement at any time by providing written notice at least thirty (30) days before termination.

d. Notices. The Parties have designated the following for the receipt of Notices related to this Agreement.

i. For the City of Fort Smith, Notices shall be provided via hard copy or email to:
City of Fort Smith
City Administrator
PO Box 1908
Fort Smith, AR 72902
administration@fortsmithar.gov

ii. For the Provider, Notices shall be provided via hard copy or email to:
Mailing address: _____
_____
_____
Email address: _____

4. AVAILABILITY OF FUNDS for the spay and neuter voucher program will be determined and budgeted each year. Vouchers are available to residents through participating service providers on a first come, first served basis until funds are depleted for the year.

The City Administrator is authorized to execute this agreement. Agreement is hereby approved and executed by representatives of the Parties, each attesting that they are duly authorized.

CITY OF FORT SMITH, ARKANSAS

DRAFT

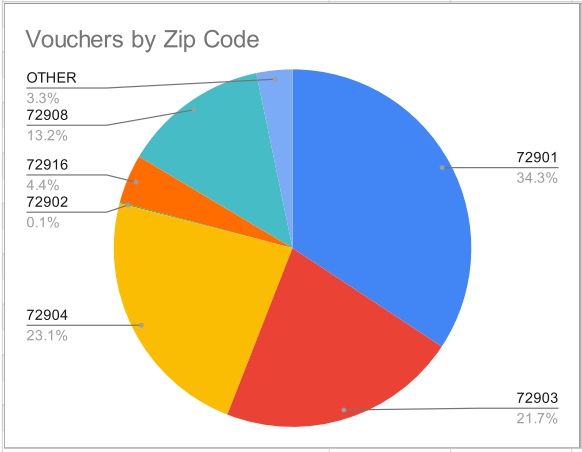
By: _____
Carl E. Geffken, City Administrator

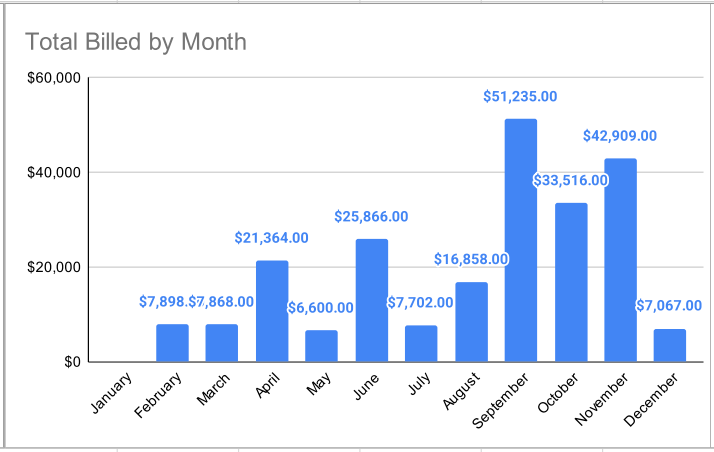
ATTEST: _____
City Clerk

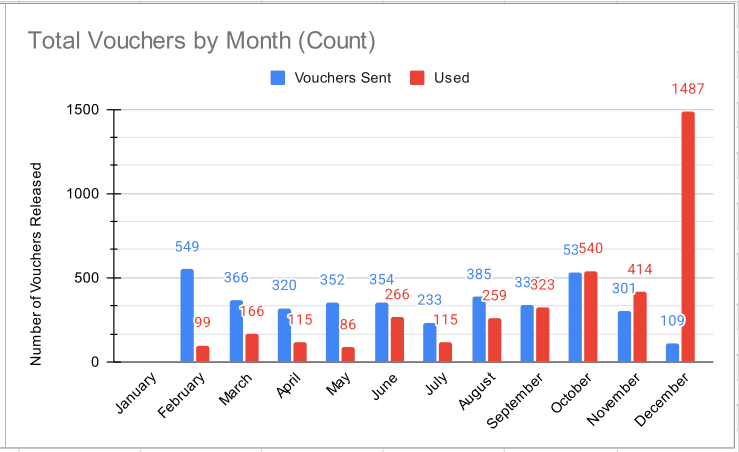
PROVIDER

_____
Provider

	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL	
Total Income Verification		549	366	320	352	354	233	385	337	530	301	109	3836	
Total Vouchers		549	366	320	352	354	233	385	337	530	301	109	3836	
Total Intake		99	166	115	86	266	115	259	323	540	414	1487	3870	
Total Receipts (some receipts are for multiple animals)		60	63	80	164	116	26	61	322	256	138	26	1312	
Total Amount Billed		$7,898	$7,868	$21,364	$6,600	$25,866	$7,702	$16,858	$51,235	$33,516	$42,909	$7,067	$228,883	
Total Animals		76	81	222	67	259	78	169	469	387	439	71	2318	
TNR Numbers				15	23	17	4	4	3	10	51	0	127	$6,350
72901		1315											1315	
72903		831											831	
72904		886											886	
72902		4											4	
72916		169											169	
72908		506											506	
OTHER		125											125	
													TOTAL	3836

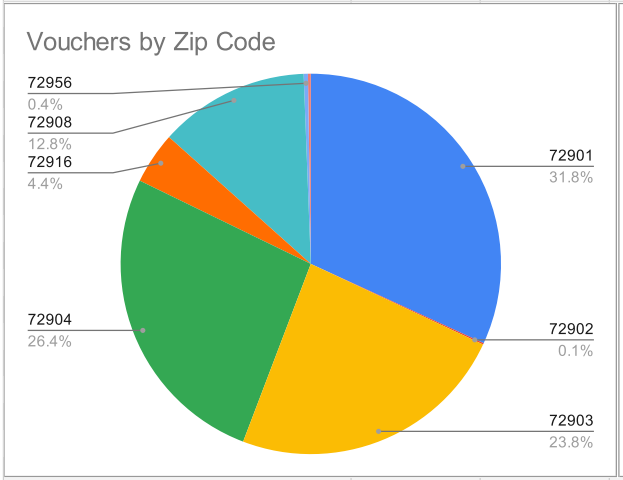


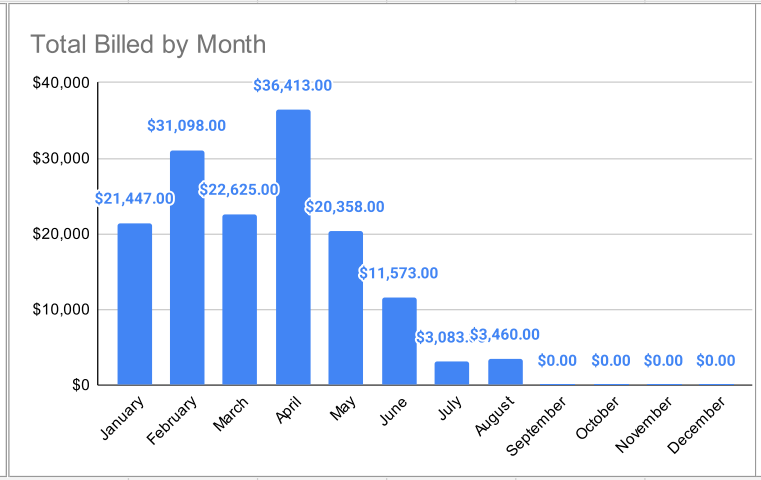


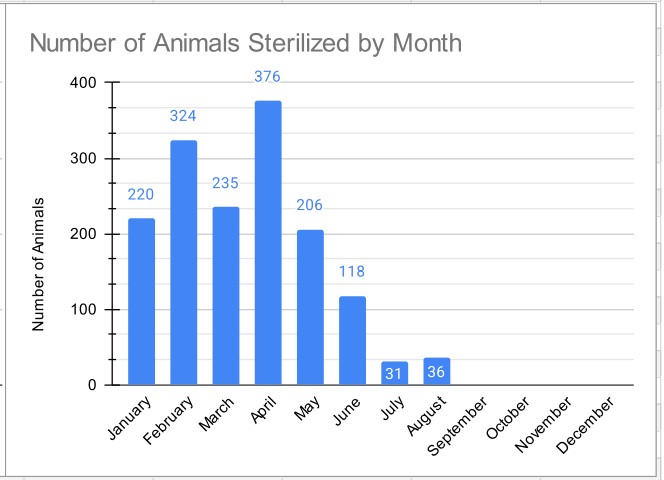


Spay & Neuter Voucher - 2025

	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL
Total Income Verification	451	346	268	403	129	16	39	6	0	0	0	0	1658
Total Receipts (some receipts are for multiple animals)	195	285	209	346	206	101	30	29	0	0	0	0	1401
Total Amount Billed	$21,447	$31,098	$22,625	$36,413	$20,358	$11,573	$3,083	$3,460	$0	$0	$0	$0	$150,057
Total Animals	220	324	235	376	206	118	31	36					1546
72901		528											528
72902		2											2
72903		395											395
72904		438											438
72916		73											73
72908		212											212
72956		6											
Other		4											4
												TOTAL	1652







MEMORANDUM

TO: Honorable Mayor and Members of the Board of Directors

FROM: Jeff Dingman, Acting City Administrator

DATE: February 5, 2026

SUBJECT: Proposed ordinance establishing accountability, disclosure, and standards for third party intermediaries in City transactions

SUMMARY

Director Christina Catsavis proposed an ordinance establishing accountability, disclosure, and standards for third party intermediaries in City transactions and offered a draft for review. The draft is attached. The Board placed this item on the February 10 study session for discussion.

ATTACHMENTS

1. 20260126_Third Party Practices Ordinance draft.docx

ORDINANCE NO. _____

AN ORDINANCE ESTABLISHING ACCOUNTABILITY AND DISCLOSURE STANDARDS FOR THIRD PARTY INTERMEDIARIES IN CITY TRANSACTIONS

WHEREAS, the City of Fort Smith routinely engages in the purchase, sale, lease, financing, and construction of public assets using taxpayer funds; and

WHEREAS, the Board of Directors has a fiduciary duty to ensure that such transactions are conducted with transparency, integrity, and full disclosure; and

WHEREAS, recent transactions have revealed deficiencies in the disclosure, accuracy, and accountability of certain third parties who participated in City transactions without a clear contractual role; and

WHEREAS, the City desires to establish clear standards governing any third party that acts as a broker, intermediary, or advisor in a City transaction in order to protect the public interest.

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF DIRECTORS OF THE CITY OF FORT SMITH, ARKANSAS:

SECTION 1: Purpose. In order to protect taxpayers and ensure that City decisions are based on accurate and complete information, this Ordinance is enacted to establish disclosure requirements, standards of conduct, and remedies applicable to any third party, as defined below, who act as a broker, intermediary, or advisor in City transactions.

SECTION 2: Definitions. For purposes of this Ordinance, the following definitions shall apply:

A. "City Employee" means a person who is directly employed by the City, receives wages or salary through the City of Fort Smith payroll system, and is subject to the City's personnel policies and supervision.

B. "Third Party Intermediary" means any person or entity that is not a City Employee, as defined herein, and that directly or indirectly:

(1) relative to a City Transaction ("Third Party Intermediary Involved City Transaction"):

(a) negotiates or facilitates a purchase, sale, lease, financing, or construction contract;
(b) presents or transmits pricing, cost estimates, proposals, or vendor information to the City;
(c) represents itself as acting in the City's interest; or
(d) receives or expects compensation related to a City Transaction from any party; and,

(2) is not a party to contract or agreement which forms the basis of the City Transaction.

For avoidance of doubt, the term "Third Party Intermediary" includes contractors, operators, management companies, consultants, advisors, brokers, and agents, regardless of whether such party performs services for or manages City facilities.

"Third Party Intermediary" shall not be construed to include the City Attorney or any attorney within the office of the City Attorney.

[***COULD THIRD PARTY INTERMEDIARY INCLUDE AN ENGINEER THE CITY HAS CONTRACTED WITH UNDER A PROFESSIONAL SERVICES AGREEMENT. DO WE WANT THAT? IS THAT PROBLEMATIC?***]

C. "City Transaction" means any agreement or proposed agreement involving the expenditure, obligation, or transfer of City funds or assets.

SECTION 3: Disclosure Requirements. A Third Party Intermediary shall provide a written disclosure to the City prior to Board approval of the Third Party Intermediary Involved City Transaction, which shall include:

A. The nature of the Third Party Intermediary's role, including whether acting as broker, agent, advisor, or independent contractor in the Third Party Intermediary Involved City Transaction;

B. Any financial interest of the Third Party Intermediary in the Third Party Intermediary Involved City Transaction;

C. Any compensation received or expected by the Third Party Intermediary from any party related to the Third Party Intermediary Involved City Transaction;

D. Any relationship between the Third Party Intermediary and the vendor, manufacturer, contractor, or financier involved in the Third Party Intermediary Involved City Transaction; and,

E. Whether any pricing, cost estimates, and timelines presented by the Third Party Intermediary are binding or estimated, and the basis for such figures.

Failure to provide complete and accurate disclosure shall constitute a violation of this ordinance.

SECTION 4: Certification of Accuracy. Any pricing, cost estimates, financial projections, delivery terms, or material representations submitted to the City by a Third Party Intermediary relative to a Third Party Intermediary Involved City Transaction shall be accompanied by a signed certification stating that:

A. The information is accurate to the best of the Third Party Intermediary's knowledge;

B. No material facts have been omitted; and,

C. The Third Party Intermediary is not knowingly providing misleading information to the City.

SECTION 5: Duty of Good Faith and Fair Dealing. With respect to any Third Party Intermediary Involved City Transaction, the Third Party Intermediary shall owe the City a duty of good faith, fair dealing, and honest disclosure with respect to all material aspects of the transaction.

SECTION 6: Remedies and Enforcement. In the event of a violation of this ordinance, the City may, in addition to any other remedies available under state law:

A. Void or rescind the affected contract or transaction;

B. Seek reimbursement or damages for losses incurred relative to the Third Party Intermediary Involved City Transaction due to misrepresentation or nondisclosure of the Third Party Intermediary;

C. Disqualify the Third Party Intermediary from participating in City transactions for a period not to exceed five years;

D. Refer the matter to the City Attorney for civil action or referral to appropriate authorities; and,

E. Impose administrative sanctions, if any, permitted by law.

SECTION 7: Integration with Procurement. No Third Party Intermediary Involved City Transaction shall be approved unless compliance with this ordinance has been certified by the City Attorney and the Director of Procurement or their designees.

SECTION 8: Severability. If any provision of this ordinance is held invalid, such invalidity shall not affect the remaining provisions.

SECTION 9: Emergency Clause. In order to ensure there is transparency in the disclosure, accuracy, and accountability of Third Party Intermediary Involved City Transactions, the Board of Directors determines that there is an immediate need for the effectiveness of the provisions of this Ordinance; therefore, an emergency is declared to exist and this Ordinance shall be in full force and effect as of the date of its passage.

PASSED AND APPROVED THIS_____DAY OF_____, 2026.

ATTEST:

_____
City Clerk

APPROVED:

DRAFT

_____
Mayor

Approved as to form:

_____
City Attorney

City of Fort Smith Finance

MEMORANDUM

TO: Jeff Dingman, Interim City Administrator

CC: Maggie Rice, Deputy City Administrator

FROM: Andrew Richards, Chief Financial Officer

DATE: February 25, 2025

SUBJECT: Review 2025 Carryover and Carryforward Requests

SUMMARY

In accordance with the City's Fiscal Policies adopted via Ordinance No. 79-19, all appropriations lapse at year-end. Any encumbrances at year-end may be reappropriated by the Board of Directors in the subsequent year. In December 2025, all departments were required to collect and submit their Carryforward and Carryover requests along with explanations of the circumstances necessitating the need to roll these requests into the 2026 Budget.

Carryforwards (Encumbrances) are legal obligations that the department entered into in 2025, but the service/item was not delivered by December 31, 2025. This request is to use 2025 monies to pay those obligations in 2025.

Carryovers are requested when objectives are not finished due to various reasons/circumstances or if another need can be met with remaining budget balances. Carryovers are a request to use available budgets from the prior fiscal year that were not obligated via contract or purchase order.

The total amount of Carryforward requests are $2,992,155 and $1,821,918 for Carryovers as outlined in Attachments A and B. Both lists were reviewed by the Acting City Administrator and Chief Financial Officer. The proposed ordinance will amend the 2026 Operating Budget for these encumbrances and carryovers.

Should you have any questions or require more information, please let me know.

ATTACHMENTS

1. Attachment A 2025 CF and CO Request for FY26 Budget.pdf
2. Attachment B 2025 CF and CO Request for FY26_Budget.pdf

ATTACHMENT A

2025 Encumbrances requested to be "Carried Forward" into 2026

START YOURS HERE:

PO#	Vendor	Amount	Account Code	Explanation	Department	Fund
25009317	Entegrity Energy Partners	726,028.00	45010101 - 531950	Solar canopy project is incomplete.	City Services	General Fund
25009222	Kenneth Kaelin	12,556.31	45030101 - 527100	Renovations to City Hall.	Facilities Maintenance	General Fund
25006459	OVERHEAD DOOR CO OF FORT SMITH INC	12,631.20	48020101 - 527100	Installation, work not complete	Fire Department	General Fund
22000503	MOTOROLA SOLUTIONS INC	47,024.24	48020101 - 527351	Radio Communication Equipment	Fire Department	General Fund
22000503	MOTOROLA SOLUTIONS INC	67,268.40	48020101 - 527352	Radio Communication Equipment	Fire Department	General Fund
25007012	RESCUE SOUTH INC	40,820.10	48020101 - 531600	Zodiac rescue boat	Fire Department	General Fund
25009768	DEPAUL SERVICES INC	173.12	56100000 - 521300	DPI Staffing was used by Utilities water line maintenance for temporary workers. (one day worked in FY26.)	HR	Water and Sewer Operating Fund
23000001	N HARRIS COMPUTER CORP	25,384.54	44010101 - 521300	CityView Implementation Travel - Ongoing Project Expected Completion FY2026	ITS	General Fund
23001812	N HARRIS COMPUTER CORP	75,649.00	44010101 - 521300	City View Licensing and Implementation - Ongoing Project Expected Completion FY2027	ITS	General Fund
25009293	COMMERCIAL DOOR & HARDWARE	3,222.59	44010101 - 527100	Door integration services - Expected completion is Q1 2026	ITS	General Fund
25009294	DELL MARKETING LP	73,441.65	44010101 - 527550	Replacement PCs - receive in January	ITS	General Fund
25009352	HEARTLAND BUSINESS SYSTEMS, LLC	4,380.00	44010101 - 521300	After-hours installation - Expected completion is Q1 2026	ITS	General Fund
25009354	HEARTLAND BUSINESS SYSTEMS, LLC	26,110.28	44010101 - 527500	Two factor authentication - Pending Items	ITS	General Fund
25009424	HEARTLAND BUSINESS SYSTEMS, LLC	6,504.72	44010101 - 527500	Massard CreekWwater Treatment Plant migration from Brivo to Verkada; TIPS #220105	ITS	General Fund
25009424	HEARTLAND BUSINESS SYSTEMS, LLC	21,900.00	44010101 - 527500	Massard Creek Water Treatment - Expected completion is Q1 2026	ITS	General Fund
25009461	HEARTLAND BUSINESS SYSTEMS, LLC	21,900.00	44010101 - 527500	P Street Water Treatment Plant - Expected completion is Q1 2026	ITS	General Fund
25009849	Ramaker	4,950.00	01010170 - 560300	Parrot Island Water Park	Non-Departmental	General Fund
25009866	CSM Waterworks	320,725.00	01010170 - 560300	Parrot Island Water Park	Non-Departmental	General Fund
25009865	Whitewater West	387,239.25	01010170 - 560300	Parrot Island Water Park	Non-Departmental	General Fund
24009929	FORT SMITH REGIONAL AIRPORT	15,000.00	01010170 - 560000	CONSTRUCTION SERVICES	Non-Departmental	General Fund
25008377	MIDWEST AUTOMATION AND CUSTOM FABRICATION INC	2,737.50	62010101 - 527200	New set of train wheels - in fabrication (will possibly receive invoice by 1/31)	Parks & Recreations	General Fund
25009206	Auto-Plex	11,381.38	47040101 - 527200	Asset #622 - Repairs in progress	Police Department	General Fund
25009207	Auto-Plex	7,225.09	47040101 - 527200	Asset #152 - Repairs in progress	Police Department	General Fund
25009208	Auto-Plex	2,588.45	47040101 - 527200	Asset #471 - Repairs in progress	Police Department	General Fund
25009509	Auto-Plex	3,787.25	47070101 - 527200	Asset #316 - Repairs in progress	Police Department	General Fund
25002666	D & D Construction	65,919.00	47020101 - 531700	Gun Range Building Project - Installation in progress	Police Department	General Fund
23003435	ProPhoenix	48,442.75	47020101 - 531600	ProPhoenix CAD/RMS System - Final Payment 2026	Police Department	General Fund
25009031	Stop Stick LTD	493.85	47040101 - 527500	Items due to arrive after 1/31/2026	Police Department	General Fund
25008582	Tri-Tech Forensics	275.94	47030101 - 527600	Evidence Room Supplies - Backorder	Police Department	General Fund
25008754	GRAPHIC SERVICE CO	5,409.30	47010101 - 527900	Graphic Wrap for 16' Trailer	Police Department	General Fund
25009437	DAVIS PRINTING INC	1,067.63	47010101 - 527900	Pawfficer Fuzz Kid Books	Police Department	General Fund
25008325	CDK ENTERPRISES	657.00	54011101 - 527600	RMA Vision camera	Public Works	Streets Maintenance Fund
25008733	CORE & MAIN	1,784.85	56100000 - 527600	3-Inch Sensus OMNI+C2 measuring chamber for Gerber	Public Works	Water and Sewer Operating Fund
25009182	CORE & MAIN	3,258.72	56100000 - 527600	6-inch Sensus OMNI+C2 measuring chamber with 25' Itron cable	Public Works	Water and Sewer Operating Fund
25008632	HENARD UTILITY	64,591.31	56100000 - 527500	250 - 5/8" Badger Meters	Public Works	Water and Sewer Operating Fund

ATTACHMENT A

2025 Encumbrances requested to be "Carried Forward" into 2026

START YOURS HERE:

PO#	Vendor	Amount	Account Code	Explanation	Department	Fund
25008636	HENARD UTILITY	68,329.37	56100000 - 527500	75 - 2" Badger Meters	Public Works	Water and Sewer Operating Fund
25009186	SCHULTE SUPPLY	1,532.95	56100000 - 527600	3"Neptune Bronze Strainer	Public Works	Water and Sewer Operating Fund
25008413	SCHULTE SUPPLY	2,190.00	56100000 - 527500	3-Inch Flanged Mach 10 ultrasonic standalone C/F 12" laylength with 25' Itron connector	Public Works	Water and Sewer Operating Fund
25008414	UNITED SYSTEMS & SOFTWARE	12,913.50	56100000 - 527500	Itron Mobile Radio	Public Works	Water and Sewer Operating Fund
24003401	SCS ENGINEERS	69,500.00	63012104 - 521300	Professional Serviceses Agreement (R-230-23) Facility Master Plan: not completed	Solid Waste	Solid Waste Fund
25008673	SIERRA CONTAINER GROUP	39,792.20	63022104 - 531400	Recycle Carts for Residential Department	Solid Waste	Solid Waste Fund
25000650	SCS ENGINEERS	7,700.00	63052104 - 520300	2025 Phase A, Cell 1-6 Area Quarterly Waste Fill Plans Prof Services (R-47-22): not completed	Solid Waste	Solid Waste Fund
25000794	SCS ENGINEERS	33,031.32	63052104 - 520300	2025 Professional Air Compliance Services: not completed	Solid Waste	Solid Waste Fund
25009916	MR AUTO GLASS	301.13	63042104-527200	Received this invoice for 2025 work in Feb. 2026	Solid Waste	Solid Waste Fund
25009150	PARADIGM SOFTWARE LLC	1,000.00	63012104-543400	Replacement for unattended credit card devises: time for specialist to commission and configure devices.	Solid Waste	Solid Waste Fund
25008691	SCS ENGINEERS	27,550.00	63052104 - 520300	2025 Annual Engineering Inspection Report (AEIR): not completed	Solid Waste	Solid Waste Fund
25008321	HANK BOUNKHONG	15,466.00	63052104 - 527200	Repairs to Valve & Actuator in the Stormwater Pond: not completed	Solid Waste	Solid Waste Fund
25008597	CRAM-A LOT	45,336.45	63072104 - 527660	Purchase a 2YD Packer, Twin Cyclinder, 34YD Capacity Compactor	Solid Waste	Solid Waste Fund
25008276	BURNS & MCDONNELL	66,157.54	41030101 - 521300	Staffing support services. Resolution No-165-25	Streets Engineering	General Fund
	SWINK ELECTRIC INC	(750.00)	01016550 - 422001	50% Reimbursement - electrical work maintenance sh	Transit	General Fund
25009522	SWINK ELECTRIC INC	1,500.00	01016550 - 527100	electrical work maintenance sh	Transit	General Fund
	GILLIG LLC	(9,147.38)	01016550 - 422002	80% Reimbursement - gillig bus parts - ONE SOURCE	Transit	General Fund
25009526	GILLIG LLC	11,434.22	01016550 - 527200	gillig bus parts - ONE SOURCE	Transit	General Fund
	GILLIG LLC	(615,995.00)	01016550 - 422002	80% Reimbursement - R-163-25 35 foot CNG low floor	Transit	General Fund
25007118	GILLIG LLC	724,700.00	01016550 - 531100	R-163-25 35 foot CNG low floor	Transit	General Fund
	HANOVER DISPLAYS INC.	(10,000.00)	01016550 - 422002	80% Reimbursement - controller & wireless download	Transit	General Fund
25009537	HANOVER DISPLAYS INC.	12,500.00	01016550 - 531300	controller & wireless download	Transit	General Fund
	MOTOROLA SOLUTIONS INC	(15,200.00)	01016550 - 422002	80% Reimbursement - radios, data, trunking, progra	Transit	General Fund
25009692	MOTOROLA SOLUTIONS INC	19,000.00	01016550 - 527500	radios, data, trunking, progra	Transit	General Fund
	ARCHITECTURE PLUS, INC.	(13,500.00)	01016550 - 422002	90% Reimbursement - Remainder of contract obligati	Transit	General Fund
25009038	ARCHITECTURE PLUS, INC.	15,000.00	01016550 - 531750	Remainder of contract obligati	Transit	General Fund
	NICOSIA CONSULTING INTERNATIONAL	(670,951.80)	01016550 - 422002	90% Reimbursement - Board Approved R-162-25 Instal	Transit	General Fund
25009047	NICOSIA CONSULTING INTERNATIONAL	745,502.00	01016550 - 531750	Board Approved R-162-25 Instal	Transit	General Fund
In process	Freese & Nichols	12,558.04	55560400 - 520300	We have a contract dated 5/10/25 with Freese & Nichols for $60,750 - To provide LFS dam inspection, monitoring, and reporting services. We have only paid $48,191.96 so far. $12,558.04 would be remaining balance for the contract.	Water Resources	Water and Sewer Operating Fund
25008255	Elite Building Solutions	69,488.69	56252101 - 527100	Replacement lab make-up air units - Will not receive/start work until 2026.	Water Resources	Water and Sewer Operating Fund
25009673	Mic Sales	2,516.31	56260000 - 527200	Krohne Opticheck Calibration - will not receive equipment back until 2026.	Water Resources	Water and Sewer Operating Fund
25009351	Ryan Edwards	22,700.00	56260000 - 521300	Tank Cleaning - Crowe Hill, Wild Cat, Woods, & Fianna Hills - Cleaning will not be complete until 2026.	Water Resources	Water and Sewer Operating Fund
25008567	Midwest Automation & Custom Fabrication	4,325.25	56260000 - 527100	Plum Street Gate Replacement- Work on gate will not be complete until 2026.	Water Resources	Water and Sewer Operating Fund

ATTACHMENT A

2025 Encumbrances requested to be "Carried Forward" into 2026

START YOURS HERE:

PO#	Vendor	Amount	Account Code	Explanation	Department	Fund
25009678	Hach Chemicals	3,366.10	56560000 - 527200	Effluent DO probe - will not receive until 2026.	Water Resources	Water and Sewer Operating Fund
25009525	Alfa Laval Inc.	2,876.14	56560000 - 527200	Bearings for Filter Press - will not receive until 2026.	Water Resources	Water and Sewer Operating Fund
25009115	DBS Manufacturing Inc.	35,413.39	56560000 - 527200	Replacement Gearbox for Massard - will not receive until 2026.	Water Resources	Water and Sewer Operating Fund
25005735	Haynes Pump & Process LLC	68,868.93	56560000 - 527200	Stabilized Sludge Pump - will not receive until 2026.	Water Resources	Water and Sewer Operating Fund
25009815	Mahg Architecture	13,295.80	56560300 - 527100	Massard WWTP Re-Roof Design Phase.	Water Resources	Water and Sewer Operating Fund
25009675	Ritec Enterprises LLC (Vertex)	4,173.00	55560400 - 527200	Back up fiber going to intake from the plant - will not receive until 2026	Water Resources	Water and Sewer Operating Fund
25009520	Pencco Inc	10,622.24	55560400 - 527650	Fluoride for plants - will not receive until 2026	Water Resources	Water and Sewer Operating Fund
25009247	Shannon & Wilson	1,750.00	55560400- 521300	Calibration data for LFS Dam - embankment/foundation & diversion tunnel piezometers - not complete until 2026	Water Resources	Water and Sewer Operating Fund
25009407	THATCHER COMPANY	21,576.00	55560400 - 527650	Soda Ash for Lake Fort Smith	Water Resources	Water and Sewer Operating Fund
25009451	THATCHER COMPANY	21,204.00	55560400 - 527650	Soda Ash for Lake Fort Smith	Water Resources	Water and Sewer Operating Fund
Total		**$ 2,992,154.81**				

ATTACHMENT B
2025 Carry Over Requests

START YOURS HERE:

Object Code where $ exists	Object Code where you want the $ to go	Amount available in Object Code	Amount Requested	Explanation	Department	Fund
41050101 - 545000	41050101 - 545000	72,656.84	51,323.00	Runoff Election and Special Election	City Clerk	General Fund
55222101 - 527200	41040101 - 531100	15,665.33	13,575.00	This request is to carry over budgeted funds associated with the insurance proceeds received for Asset 878, which was declared a total loss as the result of a motor vehicle accident. The insurance proceeds will be used soley for the replacement of Asset 878. Department 5522 has been resolved as part of the City's organizational restructuring. Employees formerly assigned to this department who utilized this vehicle have been reassigned to Human Resources; however the insurance proceeds remain restricted for the replacement of the totaled vehicle.	HR	General Fund
44010101 - 531750	44010101 - 531750	13,053.43	13,053.43	Solid Waste Fiber remains an open project. Work will run into FY2026.	ITS	General Fund
11140101 - 531700	11140101 - 531700	299,578.41	299,578.41	We still need to complete the exterior repairs to the building and parking lot. We also still need to update the signage. The current still says we are the visitor center.	Miss Laura's	General Fund
01010170 - 560300	01010170 - 560300	655,696.16	655,696.16	Installation of water slides.	Non-Departmental	General Fund
62050101 - 527100	62050101 - 527100	11,385.91	6,000.00	50/50 cost share with the CBID for installation of a fence at Compass Park Splash Pad along Belle Point Place to prevent children from running into the street.	Parks and Recreation	General Fund
47010101 - 545000	47010101 - 545000	2,052.02	552.38	Community Relations Grant - We received a $5,000 check back in 2023 from a private company to be used solely for the Public Safety Cadet Program. It was determined that the funds would be appropriated to 4701 – 545000. A running spreadsheet is kept to track how much is spent out of those funds each year and what should amount will be a Carry Over. They will actually be completely depleted in 2026.	Police Department	General Fund
63012104 - 531300	63012104 - 531300	130,000.00	130,000.00	Waste Works Software: carried over from 2024 operational budget. Waste Works Software is for a new scale house transaction and scale program. Due to the change in Directors it was not prioritized to purchase, therefore we have had to "roll-over" until purchase can be made; which is anticipated to do the first quarter of 2026.	Solid Waste	Solid Waste Fund
	01016550 - 422002		(1,716,557.14)	80% Reimbursement for - Alternate Access Road and Drainage Improvements	Transit	General Fund
	01016550 - 422002		(92,000.00)	80% Reimbursement for - Fare Collection and Trip Planning System (RFP Process Completed)	Transit	General Fund
01016550 - 531750	01016550 - 531750	2,145,696.42	2,145,696.42	Alternate Access Road and Drainage Improvements	Transit	General Fund
01016550 - 531600	01016550 - 531600	115,000.00	115,000.00	Fare Collection and Trip Planning System (RFP Process Completed)	Transit	General Fund
56560300 - 527100 56560300 - 527200	56560300 - 527100	267,120.34	200,000.00	Replacement of Massard Roofs (5 buildings total). Insurance proceeds received in 2025 total $145,373.44, with an additional $69,013.24 to be provided by insurance contingent upon completion of repairs before August 2026. Construction cost estimates provided by the architect range from $325,000 to $420,000. Funds transferred would cover the portion of costs not covered by insurance proceeds.	Water Resources	Water and Sewer Operating Fund
Total			**$ 1,821,917.66**			

City of Fort Smith Finance

MEMORANDUM

TO: Jeff Dingman, Interim City Administrator

CC: Maggie Rice, Deputy City Administrator

FROM: Andrew Richards, Chief Financial Officer

DATE: February 5, 2026

SUBJECT: Annual Review of City Auto & Property Insurance (March 2026 - February 2027)

SUMMARY

The City's auto, equipment, and property insurance policies are up for renewal for the period of March 1, 2026 through February 28, 2027. As a reminder, the City transitioned from a "traditional" insurance program to the Arkansas Municipal League (AML) program in 2016, except for one year in the traditional market for property coverage.

Below is a summary of the City's insurance premiums.

Premiums Paid	2023-2024	2024-2025	2025-2026	2026-2027*
Auto/Equipment	$419,679	$774,694	$791,077	$820,151 (Anticipated)
Property	$1,026,298	$1,151,629	$1,660,466	$1,833,950
Total	**$1,445,977**	**$1,926,323**	**$2,451,546**	**$2,654,101**

*Not including appraisal values

An annual premium is charged to each City department based on the size of their fleet/equipment and the value of the buildings and their contents.

Attached is the AML Property Renewal invoice in the amount of $1,833,950.32. The Auto/Equipment Renewal invoice is not ready at this time. However, AML has provided an estimated premium of $820,151. The final invoice will be available by the February 17, 2026, Board meeting.

AML conducted a full appraisal of City property in the fall of 2025, and the appraisal results were received this week. A review of the appraisal and its various recommendations will need to be conducted. It is estimated, at this time, that the increase in appraised values and the adjustment of contents valuations (as requested by AML) will result in approximately $75,000 additional premiums. After complete review by City staff and the City's insurance consultants (First Western Insurance and Arthur J. Gallagher & Co.), the results of the review will be brought back to the Board along with any necessary appropriation requests.

Representatives from First Western Insurance and Gallagher have prepared the attached summary of property & auto/equipment coverage and will be available to present their recommendations to the Board and answer any questions regarding renewal terms, rates, loss ratio and appraisal impacts.

ATTACHMENTS

1. 02-06-2026_Item#2143_Finance_ Insurance Renewal Summary.pdf
2. 02-06-2026_Item#2143_Finance 2026-2027 Property Renewal Invoice.pdf

Executive Summary

City of Ft. Smith

February 5, 2026

Property and Vehicle Coverage Program Renewals

The City of Ft. Smith participates in the Arkansas Municipal League's Municipal Property Program and Municipal Vehicle Program. Both are considered self-funded risk-management trusts that pool losses among participating members. These risks are currently reinsured through Alliant Reinsurance. These programs provide essential coverages in lieu of traditional insurance to its member participants.

The City of Ft. Smith has experienced losses in the last few years which exceed the participating dollars paid into the property program on a two-to-one ratio and the vehicle program approximately one- and one-half times to-one. Longterm that is not a sustainable exchange. This year the property program has proposed a rate increase of approximately 7% year over year for all members. However, due to the high experience ratio there is an additional surcharge of approximately 9% added on top of the standard participation level.

This year municipal property program has required appraisals of many City of Ft. Smith properties which raises the insured value considerably. This valuation increase will be invoiced once the changes are accepted and added into the software portal of the municipal property program. Additionally, the property program has made several administrative changes and is now requiring certain items to be separately valued and declared such as the generators. We are working with the City to evaluate these changes and quantify the increased program costs.

At this time, we have reviewed the baseline program invoices which reflects the rate increase and surcharge for the property and vehicles but does not contemplate the property valuation increase and additional separate line items. The appraised valuations once accepted will significantly increase the program spend and is being carefully evaluated to the current budget.

The appraisals were only received a couple of days ago and are still in review. We understand this is currently a moving target. The Municipal League programs offer very low per claim deductibles and renew each year but do differ from the private

marketplace. If we were placing a comparable program to this size with the current loss history and risk profile the insurance premium cost might be a bit lower but the deductible costs would be significantly higher. It is our recommendation to work through these changes and remain with your current program and continue to find ways to improve losses where possible. Our commitment is ongoing throughout the year to aid the City of Ft. Smith in evaluating and addressing risk exposures.

Respectfully submitted,

Philip H. Merry, Jr.

Philip H. Merry, Jr.
First Western Insurance

Denise M. Engle

Denise M. Engle, MBA, CPCU, AIC
Arthur J. Gallagher & Co.

MUNICIPAL PROPERTY PROGRAM

Account 7213 2/2/2026

FORT SMITH
623 Garrison Ave.
Fort Smith, AR 72901

Policy Expires On: 2/27/2027

Previous Balance Due	$-589.90
Property Amount	1,681,661.86
Surcharge	152,878.36
Adjustments from Property Changes	1,834,540.22
Current Balance Due	$1,833,950.32

Bill Date: 2/2/2026
Invoice Number:

FORT SMITH
623 Garrison Ave.
Fort Smith, AR 72901

Amount Due: **$1,833,950.32**

Amount:
Check Number:

Arkansas Municipal League
Municipal Property Program
P.O. Box 38
North Little Rock, AR 72115

MEMORANDUM

TO: Jeff Dingman, Acting City Administrator

CC: Maggie Rice, Deputy City Administrator

FROM: Todd Mittge, Director of Engineering

DATE: February 5, 2026

SUBJECT: Comprehensive Plan to address Water Infrastructure

SUMMARY

Included in your packet for discussion is a copy of a Water System Master Plan prepared in December 2022 for the Utility Department by Hawkins and Weir Engineers, Inc. The plan addressed water supply, infrastructure, water demands, recommended water distribution system improvements, water treatment plant improvements, and water transmission line improvements. Also included is a list of historic tables, contract user information, demand projects and a water storage summary to list a few. There is also information on pressure, existing system fire-flow and proposed improvements. Additional updated information will be provided at the Study Session for discussion.

Please contact me should you or members of the Board have any questions or desire additional information.

ATTACHMENTS

1. 2-10-26 Item ID 2149 Attachment Engineering-Utilities.pdf

The City of Fort Smith ARKANSAS

Water System Master Plan
Fort Smith Utility Department

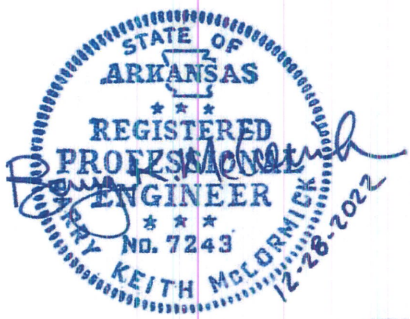
Project No. 19-09-ES1
December 2022

HAWKINS WEIR ENGINEERS, INC.

The City of Fort Smith ARKANSAS

Water System Master Plan
Fort Smith Utility Department

Project No. 19-09-ES1
December 2022



HAWKINS WEIR ENGINEERS, INC.

Table of Contents

List of Tables

List of Figures

List of Appendices

1 Authorization

The City of Fort Smith authorized the preparation of the Fort Smith Water Master Plan Report by Hawkins-Weir Engineers, Inc. in accordance with an Agreement for Professional Engineering Services approved on December 13, 2018.

2 Purpose

The purpose of this Report is to examine the adequacy of the Fort Smith water distribution system to serve residential, commercial and industrial areas within the Fort Smith city limits. The hydraulic water model developed for the Report does account for water usage by Fort Smith's contract water customers in Crawford, Sebastian and Sequoyah Counties, but this Report does not evaluate the adequacy of these contract users to store and distribute water within their respective systems. In addition to updating a computer-based hydraulic water model provided by the City of Fort Smith, the scope of this project includes the evaluation and recommendation of system improvements within the Fort Smith distribution system to maintain adequate water supply volumes and pressures for projected demands.

3 General

3.1 Background

One of the earliest comprehensive evaluations of the Fort Smith Water System was presented in a July 1977 report by the Fort Smith Public Works Department and entitled *An Analysis of a Fort Smith Water System*. This report updated a 1975 report with the same title and drew on earlier reports dating back to 1969 by city staff and engineering consultants on water supply resources, water treatment and transmission, and distribution infrastructure.

Between 1993 and 1997, Burns & McDonnell of Kansas City, Missouri, completed a four-volume Water System Master Plan for the City of Fort Smith. The volumes were entitled:

- *Water System Master Plan Volume I – Service Area, Projected Demand, and Evaluation of Existing Facilities*
- *Water System Master Plan Volume II – Water Distribution System Analysis*
- *Water System Master Plan Volume III – Evaluation of Future Water Supply Alternatives*
- *Water System Master Plan Volume IV – Study of Five Water Source Alternatives*

Other supplemental master plan reports have also been prepared for Fort Smith since the Burns & McDonnell (B&M) reports.

- *Supplement Water System Master Plan, Volume II, 1993*, a 2004 update by the City of Fort Smith to the Volume II Report by Burns & McDonnell (see above)

- *Long Term Water Demand Projections*, a 2009 report by Burns & McDonnell
- *Master Plan for Water & Sewer Service in the Southern Growth Area & Chaffee Crossing,* a 2010 report by Mickle Wagner Coleman of Fort Smith, Arkansas
- *Study of Water System Improvements to Supply Chaffee Crossing's Continued Growth,* a 2011 report by Mickle Wagner Coleman

3.2 Population Projections

3.2.1 U.S. Census Data

Population data from the U.S. Census Bureau was used to estimate the growth of water usage within Fort Smith's city limits and among its contract water users. Although the Census Bureau develops population estimates for no more than one (1) year out, the population counts from the decennial censuses can be used to estimate recent trends in population growth and decline. Making a long-term population projection from historical trends is difficult due to the inability to anticipate all changes in the local and regional economy and the effect these changes have on the availability of commercial and manufacturing jobs. Consequently, this Report will estimate future water usage for only a 10-year period, while recommending that historical population growth rates and actual water usage be re-evaluated every 5 to 10 years.

For several years, the Census Bureau reported county population data by the contributions from urban and rural (incorporated and unincorporated) areas. For the 1940 census, data was aggregated into "Metropolitan districts" in connection with cities having an urbanized population of 50,000 or more. By 1950 the Census Bureau reported the population of the Fort Smith "urbanized area" at 56,046, which included population figures from within the corporate limits of Fort Smith and Van Buren in Arkansas, and from Arkoma in Oklahoma.

In 1960, the Census Bureau introduced a new aggregate data set called the "Metropolitan Statistical Area" (MSA) and reported that the Fort Smith MSA was made up of the total urban and rural population of Sebastian County. In 1970, the Fort Smith MSA was expanded to include the populations of Sebastian and Crawford Counties in Arkansas and Le Flore and Sequoyah Counties in Oklahoma. Between 1990 and 2010, the population of Le Flore County was at first dropped and then added back to the Fort Smith MSA, but in March 2020, the Census Bureau redesignated the Fort Smith MSA to include the populations of Sebastian, Crawford and Franklin Counties in Arkansas and Sequoyah County in Oklahoma.

To project water usage growth for the next ten (10) years, modified versions of the Census Bureau's urbanized area and the MSA were evaluated. To approximate the actual water service area more closely, population data was compiled in two (2) categories as follows:

- Fort Smith Urban Area – based on the incorporated areas of Fort Smith and Barling in Sebastian County, Van Buren in Crawford County, and Arkoma in Le Flore County,
- Fort Smith Metropolitan Area – based on the county-wide populations of Sebastian and Crawford Counties in Arkansas and Le Flore County in Oklahoma.

To evaluate population trends, the year 1960 was used as the starting date since the Town of Arkoma incorporated in 1946, and the City of Barling incorporated in 1956. Population figures in the following tables reference the Census Bureau's decennial census for each city and county.[1] Tables 3.1 and 3.2 show the historic populations for the City of Fort Smith and the City of Barling since 1960, with average annual growth rates for each over the last 20 years of 0.5% and 0.7%, respectively.

Table 3.1
Historic Population of Fort Smith, Arkansas

Year	Population	Average Annual Growth
1960	52,991	
1970	62,802	1.7%
1980	71,626	1.3%
1990	72,798	0.2%
2000	80,268	1.0%
2010	86,209	0.7%
2020	89,142	0.3%
50-yr Annual Growth, 1970-2020		0.7%
20-yr Annual Growth, 2000-2020		**0.5%**

Source: U.S. Census Bureau

Table 3.2
Historic Population of Barling, Arkansas

Year	Population	Average Annual Growth
1960	770	
1970	1,739	8.5%
1980	3,761	8.0%
1990	4,078	0.8%
2000	4,176	0.2%
2010	4,649	1.1%
2020	4,782	0.3%
50-year Annual Growth, 1970-2020		2.0%
20-year Annual Growth, 2000-2020		**0.7%**

Source: U.S. Census Bureau

[1] U.S. Census Bureau, https://www.census.gov/

Tables 3.3 and 3.4 show the historic populations for the City of Van Buren and the Town of Arkoma since 1960. The City of Van Buren had an average annual growth rate over the last 20 years of 1.0%, but the Town of Arkoma declined in population over the last 20 years at an average annual rate of -0.9%.

Table 3.3
Historic Population of Van Buren, Arkansas

Year	Population	Average Annual Growth
1960	6,787	
1970	8,373	2.1%
1980	12,020	3.7%
1990	14,979	2.2%
2000	18,986	2.4%
2010	22,791	1.8%
2020	23,218	0.2%
50-year Annual Growth, 1970-2020		2.1%
20-year Annual Growth, 2000-2020		**1.0%**

Source: U.S. Census Bureau

Table 3.4
Historic Population of Arkoma, Oklahoma

Year	Population	Average Annual Growth
1960	1,862	
1970	2,098	1.2%
1980	2,175	0.4%
1990	2,393	1.0%
2000	2,180	-0.9%
2010	1,989	-0.9%
2020	1,806	-1.0%
50-year Annual Growth, 1970-2020		-0.3%
20-year Annual Growth, 2000-2020		**-0.9%**

Source: U.S. Census Bureau

Combining the populations from Tables 3.1 to 3.4 gives an approximate growth trend for the Fort Smith Urban Area, all of which is served by the Fort Smith Water System. As shown in Table 3.5, the average annual growth for the Fort Smith Urban Area was approximately 0.6% over the last 20 years and approximately 0.3% over the last 10 years.

Table 3.5
Historic Population of Fort Smith Urban Area

Year	Fort Smith	Van Buren	Barling	Arkoma	Total Population	Average Annual Growth
1960	52,991	6,787	770	1,862	62,410	
1970	62,802	8,373	1,739	2,098	75,012	1.9%
1980	71,626	12,020	3,761	2,175	89,582	1.8%
1990	72,798	14,979	4,078	2,393	94,248	0.5%
2000	80,268	18,896	4,176	2,180	105,610	1.1%
2010	86,209	22,791	4,649	1,989	115,638	0.9%
2020	89,142	23,218	4,782	1,806	118,948	**0.3%**
			50-year Annual Growth, 1970-2020			0.9%
			20-year Annual Growth, 2000-2020			**0.6%**

Source: U.S. Census Bureau

Tables 3.6 and 3.7 show the historic populations for Sebastian and Crawford Counties since 1960, with average annual growth rates for each over the past 20 years of 0.5% and 0.6%, respectively. These growth rates are similar to those for the City of Fort Smith (see Table 3.1) and the City of Van Buren (see Table 3.3).

Table 3.6
Historic Population of Sebastian County, Arkansas

Year	Population	Average Annual Growth
1960	66,685	
1970	79,237	1.7%
1980	95,172	1.9%
1990	99,590	0.5%
2000	115,071	1.5%
2010	125,744	0.9%
2020	127,799	0.2%
50-year Annual Growth, 1970-2020		1.0%
20-year Annual Growth, 2000-2020		**0.5%**

Source: U.S. Census Bureau

Table 3.7 Historic Population of Crawford County, Arkansas		
Year	**Population**	**Average Annual Growth**
1960	21,318	
1970	25,677	1.9%
1980	36,892	3.7%
1990	42,493	1.4%
2000	53,247	2.3%
2010	61,948	1.5%
2020	60,133	-0.3%
50-year Annual Growth, 1970-2020		1.7%
20-year Annual Growth, 2000-2020		**0.6%**

Source: U.S. Census Bureau

Table 3.8 shows the historic population for Le Flore County, which effectively had no growth over the last 20 years and a declining rate of -0.5% over the last 10 years. Combining the populations from Tables 3.6 to 3.8 gives an approximate growth trend for the Fort Smith Metropolitan Area as shown in Table 3.9 below, while noting that these three (3) counties cover a significantly larger area than is presently served by the Fort Smith Water System. The average annual growth for the Fort Smith Metropolitan Area was approximately 0.4% over the last 20 years, and it had a declining rate of -0.1% over the last 10 years.

Table 3.8 Historic Population of Le Flore County, Oklahoma		
Year	**Population**	**Average Annual Growth**
1960	29,106	
1970	32,137	1.0%
1980	40,698	2.4%
1990	43,270	0.6%
2000	48,109	1.1%
2010	50,384	0.5%
2020	48,129	**-0.5%**
50-year Annual Growth, 1970-2020		0.8%
20-year Annual Growth, 2000-2020		**0.0%**

Source: U.S. Census Bureau

Table 3.9
Historic Population of Fort Smith Metropolitan Area

Year	Sebastian County	Crawford County	Le Flore County	Total Population	Average Annual Growth
1960	66,685	21,318	29,106	117,109	
1970	79,237	25,677	32,137	137,051	1.6%
1980	95,172	36,892	40,698	172,762	2.3%
1990	99,590	42,493	43,270	185,353	0.7%
2000	115,071	53,247	48,109	216,427	1.6%
2010	125,744	61,948	50,384	238,076	1.0%
2020	127,799	60,133	48,129	236,061	**-0.1%**
			50-year Annual Growth, 1970-2020		1.1%
			20-year Annual Growth, 2000-2020		**0.4%**

Source: U.S. Census Bureau

In summary, an evaluation of the census figures for the last 20 years shows that population has grown at only 0.4% within the service area covered by Fort Smith's municipal and rural water customers.

3.2.2 Metropolitan Transportation Plan

The Frontier Metropolitan Planning Organization (MPO) is the regional transportation planning organization for the Fort Smith urbanized area covering parts of western Arkansas and Eastern Oklahoma. Established by federal legislation through the Federal-Aid Highway Act of 1973, MPOs are the liaison between local governments and state and federal agencies with respect to regional transportation improvements. All urban areas in the U.S. with populations over 50,000 are required by federal regulation to have an MPO to administer transportation planning programs.

In 2016, the Frontier MPO published their 20-year "Metropolitan Transportation Plan" for the Fort Smith metropolitan planning area. Frontier MPO included 25-year population projections for 13 cities and towns in the Fort Smith urbanized area along with Sebastian, Crawford, Le Flore and Sequoyah Counties. Table 3.10 is an extract of population projections from the Metropolitan Transportation Plan for the following: Fort Smith and Barling in Sebastian County, Van Buren in Crawford County, and Arkoma in Le Flore County.

Table 3.10
Historic Population of Fort Smith Urban Area

Year	Fort Smith	Barling	Van Buren	Arkoma	Total Population	Average Annual Growth
2010	86,209	4,649	22,791	1,989	115,638	
2020[1]	92,524	5,072	25,654	1,851	125,101	0.79%
2030	99,742	5,540	26,114	1,723	133,119	0.62%
2040	107,523	6,052	31,189	1,604	146,368	0.95%

[1] Frontier MPO published population projections in 2016

Sources: U.S. Census Bureau, Arkansas Municipal League, Western Arkansas Planning & Development District, University of Arkansas Little Rock (UALR), Frontier MPO

Table 3.11 is an extract of county population projections from the Metropolitan Transportation Plan for Sebastian, Crawford and Le Flore Counties.

Table 3.11
Historic Population of Fort Smith Metropolitan Area

Year	Sebastian County	Crawford County	Le Flore County	Total Population	Average Annual Growth
2010	125,744	61,948	50,384	238,076	
2020[1]	132,058	63,259	50,296	245,613	0.31%
2030	139,246	62,881	51,707	253,834	0.33%
2040	146,825	61,945	53,157	261,927	0.31%

[1] Frontier MPO published population projections in 2016

Sources: U.S. Census Bureau, Arkansas Municipal League, Western Arkansas Planning & Development District, University of Arkansas Little Rock (UALR), Frontier MPO

3.3 Population Projections

As noted previously, a projection of population growth is necessary to develop and schedule the construction of major system improvements in the Fort Smith Water System.[2] In addition to providing water to the City, the Fort Smith Water System also serves several contract water users that in turn serve surrounding rural areas. Contract water users with the City of Fort Smith include the following: Arkoma, Barling, Cedarville, Central City, Chester, Concord Water Users, Fort Chaffee Maneuver Training Center, Franklin Sebastian Public Water Authority, Highway 71 Water District No. 1, Mountainburg, Sequoyah Rural Water Corp, Van Buren, and Winslow. These contract water users also serve several third-party water users that include East Lake Water Users Association, Locke-Fern Dollard Road Waterworks Public Facilities Board, Lee Creek Water Users Association, Oak Grove Water Users Association, Sequoyah County Water Users Association, Roland, Lavaca, Charleston, and RiverSouth Rural Water District. In addition to contract and third-party water users, the following water systems maintain a metered connection with the City of Fort Smith Water System or one of the contract water users for emergency water supply: James Fork Regional Water District, Le Flore County Water District No. 2, Mansfield, Hartford, Huntington, Hackett, and Sebastian Lake Water and Sewer.

The historical population data from 1960 to 2020 presented in Section 3.2 reveals varying historical growth rates for the areas served by the City of Fort Smith Water System. Generally, the area saw an annual growth rate of approximately 1.0% over the past 50 years, but growth has slowed to approximately 0.5% over the past 20 years. As discussed in more detail in Section 5.3, historical water demands have shown a slightly higher growth rate than the historical population growth rate. For the purpose of planning for future water infrastructure needs, an annual growth rate of 1.5% was selected for water demand projections. This annual growth rate should be sufficient to account for a short term increase in population associated with the selection of Fort Smith as the new Foreign Military Sales Pilot Training Center at Ebbing Air National Guard Base.

[2] The term "Fort Smith Water System" will be used in this Report to designate the entire treatment, transmission and distribution system, including the water impoundment reservoirs, water treatment facilities, transmission lines that deliver water to wholesale contract customers and to the Fort Smith city limits, and to the water distribution system that serves the retail customers within the Fort Smith city limits. System distribution lines, pump stations, and water storage tanks owned by Contract Water Users are not included in the "Fort Smith Water System."

The term "Fort Smith distribution system" will refer only to the storage tanks, pump stations, control valves, and distribution piping that delivers water to retail customers within the city limits and rural customers on the south side of the city.

4 Existing Water Distribution System

4.1 General Description

The City of Fort Smith supplies potable water to residential, commercial and industrial customers within the city limits; to residential and commercial areas immediately south of the city limits; and to contract water users and third-party users in Crawford and Sebastian Counties in Arkansas and Le Flore and Sequoyah Counties in Oklahoma. The Service Area Map on Figure 1, located at the end of this report, identifies the water service area for Fort Smith and other contract water or third-party users served by the Fort Smith Water System.

4.2 Pipe Inventory

The City of Fort Smith Water System is comprised of approximately 719 miles of water line ranging from ¾-inch diameter up to 60 inches in diameter. A summary of the existing water line sizes and approximate lengths is shown in Table 4.1.

Table 4.1
Existing Water Line Schedule

Pipe Diameter	Quantity and Unit
Less than 2-inch	26,000 LF
2-inch	271,000 LF
2.5-inch	16,200 LF
3-inch	100,200 LF
4-inch	89,800 LF
6-inch	1,435,200 LF
8-inch	677,200 LF
10-inch	192,600 LF
12-inch	363,400 LF
14-inch	16,700 LF
16-inch	83,400 LF
18-inch	57,000 LF
20-inch	71,800 LF
22-inch	10,400 LF
24-inch	58,900 LF
27-inch	66,300 LF
30-inch	49,000 LF
36-inch	147,600 LF
48-inch	63,800 LF
60-inch	740 LF
Total	**3,797,240 LF**

4.3 Water Supply

4.3.1 Reservoirs

The Fort Smith Water System is supplied by water impoundments at Lake Fort Smith and Lee Creek Reservoir, both in Crawford County, Arkansas. Lake Fort Smith, located near the City of Mountainburg, is Fort Smith's primary water source. In 2006, construction was completed on an enlarged dam that combined the older Lake Fort Smith (8,900 acre-feet of storage) and Lake Shepherd Springs (17,600 acre-feet of storage) and expanded the combined impoundments to 84,000 acre-feet of water storage. The Lee Creek Reservoir, located near the City of Van Buren, serves as a secondary water source for Fort Smith, and when it was completed in 1992, the impoundment had 7,100 acre-feet of water storage. An evaluation of the total present storage volume, including estimating stored sediment, is beyond the scope of this Report.

4.3.2 Treatment Plants

The City of Fort Smith operates two (2) water treatment plants to supply potable water to its retail and wholesale (contract) water customers. The Lake Fort Smith Water Treatment Plant is located immediately downstream of the dam structure, and the original treatment plant was constructed in 1935. Significant expansions have occurred since that time to accommodate increased water demands and address regulatory requirements, particularly those associated with the federal Clean Water Act. The plant is permitted to treat up to 40 million-gallons-per-day (MGD), with average daily flows in 2019 of approximately 21.0 MGD and a peak daily flow of 29.4 MGD. Future expansions at the Lake Fort Smith Water Treatment Plant are expected to increase the treatment capacity from 40 MGD to 70 MGD. The first 10-MGD expansion phase is currently scheduled for completion by 2031.[3]

The Lee Creek Water Treatment Plant is located adjacent to the Lee Creek Reservoir, and plant construction was completed in 1992 along with the Lee Creek Dam. The plant is permitted to treat up to 23.3 MGD, with average daily flows in 2019 of approximately 8.3 MGD and a peak daily flow of 14.6 MGD. The maximum day combined flow from both the Lake Fort Smith and Lee Creek plants was 37.7 MGD, which occurred on August 21, 2019.

4.3.3 Transmission Lines

Water is transported to Fort Smith from the Lake Fort Smith Water Treatment Plant by 27-inch and 36-inch transmission lines and from Lee Creek Water Treatment Plant by a 48-inch transmission line. The 27-inch transmission line from Lake Fort Smith is 21.5 miles long and was constructed in 1936, followed by the 36-inch transmission line, which was constructed between 1954 and 1960. The existing 48-inch transmission line from the Lee Creek Reservoir is 5 miles long and was constructed in 1992.

These three (3) transmission lines converge just north of the Arkansas River near Knox Street in Van Buren. The Lee Creek transmission line is reduced to a 30-inch transmission line, which crosses the Arkansas River at the U.S. Highway 64/71B Bridge (Midland Bridge) and connects to the Fort Smith distribution system at the Waldron Road Pressure Reducing Station.

[3] Per Ten Year (2022-2031) Capital Improvements Plan – Water for the City of Fort Smith, approved by the Fort Smith Board of Directors on December 2, 2021.

The Lake Fort Smith transmission lines connect and cross the river as a single 48-inch transmission line in a tunnel near the Arkansas and Missouri Railroad train bridge. On the Fort Smith side of the river, this 48-inch line splits into two (2) 36-inch transmission lines. One of the lines connects to the Fort Smith distribution system at the Waldron Road Pressure Reducing Station and the other reduces down to 30-inch diameter and connects at the North "N" Street Pressure Reducing Station.

Approximately six (6) miles of the 27-inch transmission line, from the Lake Fort Smith Water Treatment Plant to Highway 282, have been replaced in recent years with a new 48-inch transmission line, and the remainder of the 27-inch transmission line is scheduled for replacement by 2030.[4] This new 48-inch transmission line from Lake Fort Smith will eventually cross the Arkansas River near the City of Barling and connect on the southeast side of Fort Smith's distribution system in the area of Chaffee Crossing.

4.4 Infrastructure

4.4.1 Pump Stations

The Fort Smith Water System includes sixteen (16) potable water pump stations. Two (2) of those are finished water pump stations located at the Lake Fort Smith and Lee Creek Water Treatment Plants, and one (1) other is utilized to serve a contract water user. The Contract Water Users Pump Station serves contract water users north of the Lake Fort Smith Water Treatment Plant in Crawford County, Arkansas. The remaining thirteen (13) potable water pump stations are located within or just outside of the Fort Smith city limits and serve retail water customers (i.e., residential, commercial, and industrial) within and immediately south of the city limits (see Figure 2 at the end of this Report). Appendix A provides a summary of information such as pump age, pump size and model, motor size, design conditions, etc., for these sixteen (16) pump stations.

4.4.2 Water Storage Tanks

The Fort Smith Water System includes thirteen (13) water storage tanks and four (4) clearwell tanks. The Contract Water Users Tank in Crawford County serves contract water users north of the Lake Fort Smith Water Treatment Plant. Eleven (11) water storage tanks are located within the city limits of Fort Smith, and one (1) tank is located south of the city limits (see Figure 2). These twelve (12) tanks serve the retail water customers within the Fort Smith distribution system.

As noted above, there are four (4) clearwell tanks at the two (2) water treatment plants where treated water is stored before delivery to Fort Smith. The Lee Creek Clearwell is located at the Lee Creek Water Treatment Plant, and the other three (3) clearwells are located at the Lake Fort Smith Water Treatment Plant. Table 4.2 gives a summary of tank dimensions, overflow elevations, and water storage volumes for all tanks and clearwells.

[4] Per Ten Year (2022-2031) Capital Improvements Plan – Water for the City of Fort Smith, approved by the Fort Smith Board of Directors on December 2, 2021.

4.4.3 System Control

The Fort Smith Water System is made up of a network of pipes, control valves, flow meters, pump stations, and water storage tanks that are monitored and controlled by a Supervisory Control and Data Acquisition (SCADA) system. The SCADA system controls the operation of pump stations and control valves as necessary to maintain predetermined tank levels or pressures in the distribution system. The operational setpoints for the pump stations and control valves are based on providing adequate pressures to fill storage tanks and maintain the hydraulic grade line of the corresponding pressure zones. Figure 3, located at the end of this Report, provides a distribution profile of the water system.

Most operational setpoints in the SCADA system are predetermined and automated, and they rarely require manual adjustment. The exceptions are the control setpoints for the Lake Fort Smith Finished Water Pump Station, Lee Creek Finished Water Pump Station, Euper Pump Station, Haven Hill Control Valve, Luce Control Valve, and Wildcat Mountain Control Valve, which can all be operated remotely by water operators in response to system demand needs. The tank levels in the Haven Hill, Luce and Wildcat Mountain Ground Storage Tanks are monitored constantly, and water operators can remotely open and close control valves as necessary to fill and maintain adequate water levels in any of these three (3) tanks. During increased demand periods or in the event of a water main break or other emergency, the SCADA controls can be used to remotely increase the pumping rates at the Lake Fort Smith and Lee Creek Finished Water Pump Stations in order to deliver more water to the distribution system.

Water is typically delivered to the Haven Hill, Luce and Wildcat Mountain Ground Storage Tanks by gravity from the north part of the distribution system, and the Euper Pump Station is maintained in standby mode. However, if adequate water levels cannot be maintained in the Haven Hill, Luce and Wildcat Mountain Ground Storage Tanks during periods of high demand, the Euper Pump Station is operated remotely to increase flow and pressure head to deliver water to these tanks. The operational setpoints for control valves and pump stations are detailed in Appendix B.

Table 4.2
Tank Information

Water Storage Tank	Overflow Elevation (ft)	Minimum Water Level Elevation (ft)	Base Elevation (ft)	Tank Diameter (ft)	Tank Height (ft)	Total Nominal Volume (gal)	Effective Storage Volume (gal)
Haven Hill Ground Storage Tank	630	612	612	- [1]	18	4,000,000	4,000,000
Country Club Elevated Tank	769	737	612.5	45	156.5	250,000	250,000
Wildcat Mountain Ground Storage Tank	631	601	601	200	30	7,500,000	7,500,000
Wildcat Mountain Standpipe	703	652	606	45	97	1,000,000	521,000
Crowe Hill Ground Storage Tank	709.5	691	691	105	18.5	1,200,000	1,200,000
Crowe Hill Elevated Tank	820	788	699	45	121	250,000	250,000
Luce Ground Storage Tank	632	601	601	200	31	7,500,000	7,500,000
The Woods Elevated Tank	695.5	665.5	595.5	45	100	250,000	250,000
Chaffee Crossing Ground Storage Tank	645	616	616	121	29	2,500,000	2,500,000
Fianna Hills Elevated Tank	827.5	790.5	697.5	40	130	250,000	250,000
Jack Freeze Ground Storage Tank	627	579	579	164	48	7,500,000	7,500,000
Howard Hill Elevated Tank	765	725	633	59	132	750,000	750,000
Contract Water Users Tank	1,283.5	1,180	1,180	12	103.5	88,000	48,000
Lee Creek Clearwell	502.5	483	483	150	19.5	2,500,000	2,500,000
Lake Fort Smith 2 MG Clearwell	794.5	775	775	- [2]	19.5	2,000,000	2,000,000
Lake Fort Smith 3 MG Clearwell	794.5	775	775	160	19.5	3,000,000	3,000,000
Lake Fort Smith 4 MG Clearwell	794.5	775	775	184.5	19.5	4,000,000	4,000,000
Totals						**44,538,000**	**44,019,000**

[1] The Haven Hill Tank is a square structure with dimensions of 300' long x 100' wide x 18' tall.

[2] The Lake Fort Smith 2 MG Clearwell is a square structure with dimensions of 115' long x 116' wide x 19.5' tall

4.5 Pressure Zones

The Fort Smith Water System operates in 20 pressure zones with the hydraulic grade of each being established by the various tank overflow elevations and system controls described above. Details on each of the pressure zones are provided below, and their service boundaries are defined on Figure 4, located at the end of this Report. Each of the 20 pressure zones is also included in the hydraulic water model of the distribution system.

4.5.1 BHN-P795

The BHN-P795 pressure zone operates at a hydraulic grade of 795 ft. above mean sea level (msl) and serves the area near the west end of Brooken Hill Drive in south Fort Smith. It is served by the FIH-P825 pressure zone (in the Fianna Hills area) through two (2) 6-inch pressure reducing valves; the first is located near the intersection of Belhaven View and Bramble Brae Street, and the second is located on Wellington Way.

4.5.2 BNS-P004

The BNS-P004 pressure zone operates at a hydraulic grade of 699 ft. msl and serves the area of central Fort Smith near Carthage Drive and South Boston Street between Country Club Avenue and South 21st Street. It is served by the CCB-P769 pressure zone through a 6-inch pressure reducing valve located near the intersection of Country Club Avenue and South Boston Street.

4.5.3 CCB-P769

The CCB-P769 pressure zone operates at a hydraulic grade of 769 ft. msl and serves the area of west central Fort Smith bordered by South "S" Street, South 16th Street, Country Club Avenue, and Old Greenwood Road. It is served by the Country Club Elevated Tank, which is filled by the WAM-P660 pressure zone via the Haven Hill Pump Station.

4.5.4 CHC-P645

The CHC-P645 pressure zone operates at a hydraulic grade of 645 ft. msl and serves the Chaffee Crossing area in eastern Fort Smith. It is served by the Chaffee Crossing Ground Storage Tank, which is filled by the Chaffee Crossing Pump Station.

4.5.5 CHR-P707

The CHR-P707 pressure zone operates at a hydraulic grade of 707 ft. msl and serves the north central part of the system. It is bordered on the north by Dodson Avenue and Free Ferry Road, on the east by Interstate 540, on the south by Tulsa Street; and its western border varies but is generally defined as Jenny Lind Road. It is served by the Crowe Hill Ground Storage Tank, which is filled by the WAM-P660 pressure zone via the Old Greenwood and Country Club Pump Station.

4.5.6 CRH-P820

The CHR-P820 pressure zone operates at a hydraulic grade of 820 ft. msl and serves areas around Old Greenwood Road in central Fort Smith between South Gary Street and South Cliff Drive. It is served by the Crowe Hill Elevated Tank, which is filled by the Crowe Hill Pump Station.

4.5.7 FIH-P825

The FIH-P825 pressure zone operates at a hydraulic grade of 825 ft. msl and serves the Fianna Hills Area in south Fort Smith. It is served by the Fianna Hills Elevated Tank, which is filled by the Fianna Hills Pump Station.

4.5.8 GLF-P715

The GLF-P715 pressure zone operates at a hydraulic grade of 715 ft. msl and serves the areas along Glen Flora Way in Fianna Hills. It is served by the FIH-P825 pressure zone through two (2) 6-inch pressure reducing valves; the first is located near the intersection of Glen Flora Way and Carmen Vincent Court, and the second is located near the intersection of Glen Flora Way and Jenny Lind Road.

4.5.9 HLW-P630

The HLW-P630 pressure zone operates at a hydraulic grade of 630 ft. msl and is one of the larger pressure zones in the system. It serves the central part of the distribution system and provides water to most of the pressure zones on the south side. It is primarily served by the both the Wildcat Mountain Ground Storage Tank and Luce Ground Storage Tank, which are filled via 20-inch and 24-inch flow control valves, respectively. The Wildcat Mountain flow control valve is located along Massard Road between Kathleen Terrace and Dover Circle. The Luce flow control valve is located along Leigh Avenue between Cliff Drive and Interstate 540. Both flow control valves are served from transmission lines from the water treatment plants.

4.5.10 HVC-P700

The HVC-P700 pressure zone operates at a hydraulic grade of 700 ft. msl and serves the area in Fianna Hills bordered by Brooken Hill Drive, Columbus Acres Road, Glen Flora Way, and Croxted Road. It is served by the GLF-P715 pressure zone through a 4-inch pressure reducing valve that is located on Hanover Court.

4.5.11 JFR-P627

The JFR-P627 pressure zone operates at a hydraulic grade of 627 ft. msl and serves an area that is centered on the intersection of Interstate 540 and U.S. Highway 71 South, just south of the HLW-P630 pressure zone. It is served by the Jack Freeze Ground Storage Tank, which is filled by the Brooks-Stephins Pump Station.

4.5.12 MMY-P745

The MMY-P745 pressure zone operates at a hydraulic grade of 745 ft. msl and serves the area around Moody Road in eastern Fort Smith. It is served by the HLW-P630 pressure zone by way of the Moody Road Pump Station.

4.5.13 MTB-P002

The hydraulic grade of the MTB-P002 pressure zone varies. The majority of this pressure zone is located outside the Fort Smith city limits, except for a small area near the intersection of Riverfront Drive and Midland Boulevard. This pressure zone is primarily used to serve contract water users along the transmission line routes, but it also serves some Fort Smith commercial and industrial users along Riverfront Drive in the vicinity of Fort Smith Park. There is also a 2-inch pressure reducing valve located near Riverfront Drive and North 6th Street that serves Fort Smith Park and is included in the pressure zone.

The MTB-P002 pressure zone is served by the transmission lines from both Fort Smith water treatment plants. The discharge head at the Lee Creek Finished Water Pump Station is approximately 718 ft msl, and the Lee Creek transmission line generally serves contract users in western Crawford County and the northwest side of Van Buren. The Lake Fort Smith transmission line serves the majority of the contract water users in Crawford County, as well as the eastern side of Van Buren. Its normal pressure grade at the Lake Fort Smith Water Treatment Plant is 794.5 ft msl, which is based on the overflow elevation of the clear wells; however, the finished water pumps at the plant can increase the pressure grade to approximately 965 ft with two (2) of the three (3) pumps in operation. The pressure grade along both transmission lines varies between the Water Treatment Plants and the Fort Smith city limits due to changes in elevation and pressure losses in the transmission lines due to friction.

4.5.14 PCD-P003

The PCD-P003 pressure zone operates at a hydraulic grade of 720 ft. msl and serves the Sebastian Woods Subdivision which is located along Cliff Drive just west of South 30th Street. It is served by the CRH-P820 pressure zone through three (3) 6-inch pressure reducing valves that are located at the subdivision entrance.

4.5.15 RSW-P865

The RSW-P865 pressure zone operates at a hydraulic grade of 865 ft. msl and serves the area of Fianna Hills bordered by Royal Scots Way, Stoneleige Street, Ramsgate Way, and Inverness Street. It is served by the FIH-P825 pressure zone by way of the Royal Scots Booster Station and through three (3) separate check valves located on Canongate Way, Harrow Heath Street, and Castleton Way. The Royal Scots Way Pump Station is the primary means of service, and the check valves allow supplemental flow into the pressure zone to meet fire flow demands.

4.5.16 RYH-P765

The RYH-P765 pressure zone operates at a hydraulic grade of 765 ft. msl and serves the southernmost part of the Fort Smith distribution system, which extends south of the city limits to Bonanza Road. It is served by the Howard Hill Elevated Tank, which is filled by the Rye Hill Pump Station.

4.5.17 SPM-P001

The SPM-P001 pressure zone operates at a hydraulic grade of 882-ft. msl and serves the west end of Spring Mountain Road. It is served by the RYH-P765 pressure zone by way of the Spring Mountain Pump Station.

4.5.18 TWD-P695

The TWD-P695 pressure zone operates at a hydraulic grade of 695 ft. msl and serves some of the higher elevations on the eastern side of the Fort Smith distribution system near Chaffee Crossing. It is served by The Woods Elevated Tank, which is filled by The Woods Pump Station.

4.5.19 WAM-P660

The WAM-P660 pressure zone operates at a hydraulic grade of 640 ft. msl and serves the northern sections of the Fort Smith distribution system. It is bordered on the north by the Arkansas River, extends the full width of the system, and is bordered on the south by Free Ferry Road, Dodson Avenue, and Navy Road. It is served by the Waldron Road Pressure Reducing Station and North "N" Street Pressure Reducing Station, via the existing transmission lines and the Haven Hill Ground Storage Tank.

The Waldron Road Pressure Reducing Station is located near the intersection of Midland Boulevard and North 50th Street, and it includes two (2) 16-inch pressure reducing valves and an 18-inch pressure reducing/pressure sustaining valve. The station operates automatically to transfer flow between the Lake Fort Smith 36-inch transmission line and the Lee Creek 30-inch transmission line. When pressure in the 36-inch transmission line is higher, the station acts as a pressure reducing station; and when pressure on the 30-inch transmission line is higher, the station switches to a pressure sustaining mode.

The North "N" Street Pressure Reducing Station is located near the intersection of North 50th Street and North "N" Street, and it includes two (2) 12-inch pressure reducing valves. The North "N" Street Pressure Reducing Station is served by a 30-inch diameter transmission line from the Lake Fort Smith Water Treatment Plant, and the Haven Hill Ground Storage Tank is filled by the transmission lines via a 20-inch flow control valve located at the Haven Hill Ground Storage Tank site.

4.5.20 WMS-P708

The WMS-P708 pressure zone operates at a hydraulic grade of 703 ft. msl and primarily serves the area of east Fort Smith located north of Rogers Avenue and east of Interstate 540. It is served by the Wildcat Mountain Standpipe, which is filled by the HLW-P630 pressure zone via The Wildcat Mountain Pump Station.

5 Water Demands

5.1 Non-Revenue Water

Water demands can be broken down into two (2) categories: revenue and non-revenue water. Revenue water includes metered water sales to both retail and wholesale customers, while non-revenue water is that volume attributed to water loss caused by distribution system leaks, system flushing, fire hydrant flows, water meters under-registering, etc. To assist in the evaluation of the Fort Smith Water System, the City provided records for metered water sales for the month of August 2019 and daily operation records from their SCADA system for water production at the Lake Fort Smith and Lee Creek Water Treatment Plants for the period between January 2019 and December 2019. The metered sales records were used to determine the volume of revenue water (water sold) in August 2019, and the SCADA records were used to estimate the amount of non-revenue water for the same period. Water production and usage data from 2020 was not used to evaluate non-revenue or revenue water demands due to concerns that quarantines and other restrictions during the COVID-19 Pandemic (e.g., businesses being closed, restricted travel, people working from home, etc.) might create anomalies in water usage during the year.

Using the SCADA records, the total quantity of water produced at both water treatment plants was determined for August 2019 (in million gallons, MG). Table 5.1 shows the comparison of total water quantity produced to the metered sales quantity and the calculation of an approximate percentage of non-revenue water volume distributed through the system.

Table 5.1
Non-Revenue Water Summary

Description	Quantity (MG)
Water Produced in August 2019	1,025
Water Sales in August 2019	773
Total Estimated Non-Revenue Water	252
Non-Revenue Water Percentage	**24.6%**

The estimated non-revenue water percentage of 24.6% was assumed to remain constant throughout all water demand scenarios evaluated with the Fort Smith water model. It should be noted that the City of Fort Smith has started a water meter replacement program in an effort to reduce non-revenue water. The City has replaced approximately 70% of the water meters within the city limits, and all water meter replacements are scheduled to be completed by the end of 2022.

5.2 Revenue Water

Revenue water includes metered water sales to both retail and wholesale customers. Retail customers include residential, commercial, and industrial users that are generally located within and immediately south of the Fort Smith city limits. Wholesale customers are the Contract Water Users identified in Section 3.3. Based on 2019 water usage data, Table 5.2 provides a breakdown of the water customer classification in Fort Smith based on 2019 water usage data.

Table 5.2
Customer Classifications

Classification	Number of Users
Residential	29,825
Commercial	4,523
Industrial	55
Wholesale	14[1]
Total	**34,417**

[1] Includes a total of 21 meters.

The Average Daily Demand (ADD) was determined based on the 2019 usage data and was used as the baseline for all demand projections. A breakdown of the 2019 ADD Revenue Water by user classification is provided in Table 5.3.

Table 5.3
Breakdown of 2019 ADD Revenue Water by User Class

User Class	Number of Users	Water Demand (MGD)
Residential	29,825	6.4
Commercial	4,523	6.0
Industrial	55	4.4
Wholesale	14	9.6
Total Revenue Water		**26.4**

Wholesale customers are typically required by contract to provide adequate water storage within their respective systems. This allows the City of Fort Smith to limit bulk water supply rates to the ADD flow for most wholesale customers. This ultimately lessens the burden of providing bulk water at peak hourly demand (PHD) rates to these contract users during periods when Fort Smith is also experiencing higher water usage by their retail customers.

Excluding wholesale customer demands, SCADA records for the Fort Smith water treatment plants show an average daily output of approximately 19.7 MGD and a maximum daily output of 28.1 MGD, which occurred in August 2019. This suggests a peaking factor of 1.43 (143% of ADD) for retail customers (non-wholesale), which was used to project Maximum Daily Demands (MDDs) for the future water demand. Peaking factors for wholesale users were assumed to be negligible, and so their demands were assumed to remain constant between ADD and MDD. As noted, wholesale water customers are expected to provide internal water storage volumes that are sufficient to meet additional water demand requirements during periods of peak usage.

5.3 Demand Projections

The purpose of this Report is to examine the adequacy of the Fort Smith Water System to serve residential, commercial, and industrial areas within and immediately south of the city limits. This Report also includes recommended improvements within the distribution system to maintain adequate water supply volumes and pressures for projected demands.

The City of Fort Smith provided water production records from both the Lake Fort Smith and Lee Creek water treatment plants for 2000 to 2019.[5] As shown in Table 5.4, there has been little increase in the amount of water treated over the past 20 years, but when considering the last 10 years, there has been an average annual increase of 1.14% in water production. As detailed in Section 3.3, an evaluation of population trends for the same 10-year period revealed the approximate population served by the Fort Smith water service area grew at an average annual rate of 0.3% or less (see Tables 3.5 and 3.9).

Table 5.4
Historical Water Treatment Plant Production

Year	ADD (MGD)	ADD Annual Growth
2000	29.04	--
2005	28.84	-0.13%
2010	26.44	-1.72%
2015	26.85	0.31%
2019	29.27	2.18%
19-Year Annual Growth, 2000-2019		**0.04%**
9-Year Annual Growth, 2010-2019		**1.14%**

[5] See discussion in Section 5.1 concerning the use of water plant production data from 2019 instead of 2020.

In addition to water treatment plant production records, the City also provided usage records for all contract water users for the past 5 to 10 years. As shown in Table 5.5, the average annual growth for contract water users varied significantly; however, the overall weighted average water usage among contract water users increased by 0.86%, which is slightly less than the 9-year increase in water treatment plant production between 2010 and 2019 as presented in Table 5.4. For the purpose of planning for future water infrastructure needs in this Report, a conservative growth rate of 1.5% was selected for all water demand projections.

Table 5.5
Contract Water Users Annual Growth Rates

Contract Water Users	2019 Demand (GPD)	Average Annual Growth
Arkoma	166,000	0.54%
Barling	630,000	6.67%
Cedarville	1,347,000	3.04%
Central City	68,000	9.56%
Chester	27,000	8.12%
Concord Water Users	350,000	6.15%
Fort Chaffee Maneuver Training Center	53,000	-6.47%
Franklin Sebastian Public Water Authority	591,000	-0.04%
Highway 71 Water District No. 1	693,000	-3.98%
Mountainburg	98,000	3.62%
Sequoyah Rural Water Corp.	423,500	-0.62%
Van Buren	4,975,500	-0.29%
Winslow	179,000	7.61%
Total 2019 Demand	**9,601,000**	
Annual Growth Weighted Average		**0.86%**

Using the 2019 ADD as a baseline and the estimated 1.5% annual growth rate, demand projections were made for the 2021 ADD scenario and the 2031 ADD scenario. Additionally, demand projections for the 2021 MDD and 2031 MDD scenarios were developed using a peaking factor of 1.43 for all retail water usage (non-wholesale), as outlined in Section 5.2. The percentage of non-revenue water was assumed to remain constant at 24.6% between all demand scenarios. The projections for 2021 ADD, 2021 MDD, 2031 ADD, and 2031 MDD for all water usage (i.e., retail water usage, wholesale water usage, and non-revenue water usage) are summarized in Table 5.6, and a detailed breakdown of existing and projected contract water usage is provided in Table 5.7.

Table 5.6
Fort Smith Water Demand Projections

User Class	2019 ADD (MGD)	2019 MDD (MGD)	2021 ADD (MGD)	2021 MDD (MGD)	2031 ADD (MGD)	2031 MDD (MGD)
Residential	6.4	9.2	6.6	9.5	7.7	11.0
Commercial	6.0	8.6	6.2	8.9	7.2	10.3
Industrial[1]	4.3	6.2	7.1	9.0	7.8	10.0
Wholesale	9.6	9.6	10.0	10.0	11.7	11.7
Non-Revenue	6.5	8.3	7.4	9.2	8.4	10.6
Total	**32.8**	**41.9**	**37.3**	**46.6**	**42.8**	**53.6**

[1] Owens Corning is currently constructing a facility in Fort Smith along Arkansas State Highway 45 that is scheduled for completion in 2022. Owens Corning has indicated that they will have an initial average daily water demand of 1,800 GPM (2.59 MGD), which has been included in the total industrial demand for the 2021 and 2031 modeling scenarios. Due to potential reduced system pressures, the Owens Corning facility demand will be restricted to a MDD of 1,800 GPM until additional distribution system improvements are constructed (see Section 8.1).

Table 5.7
Contract Water Users Demand Projections

Contract Water Users	2019 Demand (GPD)	2021 Demand (GPD)	2031 Demand (GPD)
Arkoma[1]	166,000	171,000	198,500
Barling[1]	630,000	649,000	753,200
Cedarville	1,347,000	1,387,700	1,610,500
Central City[2]	68,000	70,100	81,300
Chester	27,000	27,800	32,300
Concord Water Users	350,000	360,600	418,500
Fort Chaffee Maneuver Training Center[2]	53,000	54,600	63,400
Franklin Sebastian Public Water Authority[2] [3]	591,000	758,900	880,700
Highway 71 Water District No. 1	693,000	713,900	828,600
Mountainburg	98,000	101,000	117,200
Sequoyah Rural Water Corp.	423,500	436,300	506,300
Van Buren	4,975,500	5,125,900	5,948,800
Winslow	179,000	184,400	214,000
Total	**9,601,000**	**10,041,200**	**11,653,300**

[1] The Town of Arkoma and the City of Barling are served by the HLW-P630 Pressure Zone.

[2] Central City, the Fort Chaffee Maneuver Training Center, and Franklin Sebastian Public Water Authority are served by the CHC-P645 Pressure Zone. All remaining contract water users are served by the MTB-P002 Pressure Zone.

[3] RiverSouth was added as a user in October 2021, and they are expected to use approximately 150,000 GPD. The 2021 demand for Franklin Sebastian Public Water Authority has been adjusted to include the additional 150,000 GPD.

6 Hydraulic Analysis

The City of Fort Smith Water System was analyzed using the hydraulic water modeling software Infowater Pro, Version 2.5.0.[6] Hawkins-Weir assisted the City of Fort Smith in developing and calibrating the initial water model and subsequently updated the model using 2019 water demand data. The City installed and monitored pressure loggers at various fire hydrants throughout the system, and the data collected from these pressure loggers was used to verify the model calibration with respect to residual pressures. Tank geometry and operational setpoints for pumps and valves were updated to correlate with information from record drawings and daily operational data collected by the City's SCADA system.

To identify storage and distribution system deficiencies, the existing water system was modeled with the following demands: 2021 ADD, 2021 MDD, 2031 ADD, and 2031 MDD. Each demand scenario consists of both an extended period simulation (24-hour hydraulic analysis) and a fire flow analysis. Diurnal patterns were applied to residential, commercial, and industrial demands that simulate peak usage as they have historically occurred (e.g., peak usage for residential users typically occurs during the morning and evening). These diurnal patterns were developed by the City of Fort Smith during initial setup of the hydraulic model, and they were used for all extended period simulations.

By running both extended period simulations and fire flow analyses for each demand scenario, the Fort Smith Water System was evaluated on its ability to meet the total water demand for the scenario while maintaining a minimum residual pressure of 20 pounds-per-square-inch (20 psi) for each customer. The extended period simulations were used to confirm the ability of the system to draft water from storage tanks during periods of high demand and to then recover (refill) to their normal operating levels during periods of low demand. The water system was also evaluated on its ability to produce a minimum fire flow rate of 1,000 gallons-per-minute (gpm) for residential customers and 1,500 gpm for commercial and industrial customers while maintaining a minimum residual pressure of 20 psi. Some areas of the distribution system with small diameter or dead-end lines are not designed to supply fire flow demands.

To resolve distribution system deficiencies, similar extended period simulations and fire flow analysis were modeled for each demand scenario assuming the proposed water system improvements were constructed. Improvements were modeled for both the 2031 ADD and 2031 MDD scenarios, and a list of improvements was developed. The various improvements will be detailed in Section 8 of this Report.

[6] InfoWater Pro by Innovyze, Inc., www.innovyze.com

7 Existing Water Distribution System Deficiencies

The existing water distribution system was evaluated on its ability to draft and refill water storage tanks; to provide minimum fire flow rates of 1,000 gpm for residential customers, and 1,500 gpm for commercial and industrial customers; to maintain minimum residual pressures to all customers of 20 psi during each of the demand scenarios; and to address maintenance related items such as inaccessible, aging, or undersized pipes. Deficiencies in the existing distribution system for current and future demand scenarios are outlined in the following sections.

7.1 Water Storage Evaluation

A water storage summary for the twelve (12) tanks in the Fort Smith distribution system (inside and outside the city limits) and three (3) of the four (4) clearwells located at Fort Smith's two (2) water treatment plants is provided in Table 7.1.

The current edition of the *10 States Standards* recommends that water systems provide storage capacity equal to the average daily water consumption.[7] The 24-hour net-effective water storage requirements for the Fort Smith distribution system were evaluated under the following assumptions:

- Water storage tanks were evaluated in each of the 20 Pressure Zones (see Section 4.5), including 7 million gallons (MG) of clearwell storage at the Lake Fort Smith Water Treatment Plant and 2.5 MG of clearwell storage at the Lee Creek Water Treatment Plant. The 2 MG clearwell at the Lake Fort Smith Water Treatment Plant was excluded from the net-effective storage volume calculation for the Fort Smith Water System as the tank is used for disinfection contact time. The 88,000-gal Contract Water Users Standpipe in Crawford County was also excluded.
- The net-effective storage volumes were compared to the 2031 ADD requirements for Fort Smith retail customers only, i.e., residential, commercial and industrial customers in the 20 Pressure Zones were considered, and contract water customers were excluded. As mentioned previously, contract water customers (wholesale) are expected to provide internal water storage volumes that are sufficient to meet 24-hour demands within their systems in the event there is a major disruption in the water supply.
- Non-revenue water demand is included in the 2031 ADD volumes in Table 7.1 (see 24.6% Non-Revenue Water Percentage in Table 5.1).

A summary of the water storage evaluations follows in Table 7.1.

[7] Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, *Recommended Standards for Waterworks, 2018 Edition* (St. Paul: Minnesota's Bookstore), 122.

Table 7.1
Water Storage Summary

Water Storage Tank	Pressure Zones Served	2031 ADD[1] (GPD)	Total 2031 ADD (GPD)	Total Storage Volume (gal)	Effective Storage Volume (gal)
Clearwells at Lake Fort Smith WTP and Clearwell at Lee Creek WTP	MTB-P002	125,600	125,600	9,500,000	9,500,000
Wildcat Mountain Ground Storage Tank and Luce Ground Storage Tank	HLW-P630 MMY-P745	4,838,300 271,800	5,110,100	15,000,000	15,000,000
Wildcat Mountain Standpipe	WMS-P708	1,106,600	1,106,600	1,000,000	521,000
Haven Hill Ground Storage Tank	WAM-P660	12,408,500	12,408,500	4,000,000	4,000,000
Country Club Elevated Tank	CCB-P769 BNS-P004	302,000 14,000	316,000	250,000	250,000
Crowe Hill Ground Storage Tank	CHR-P707	2,333,900	2,333,900	1,200,000	1,200,000
Crowe Hill Elevated Tank	CRH-P820 PCD-P003	474,600 14,600	489,200	250,000	250,000
Chaffee Crossing Ground Storage Tank	CHC-P645	789,500	789,500	2,500,000	2,500,000
The Woods Elevated Tank	TWD-P695	295,000	295,000	250,000	250,000
Jack Freeze Ground Storage Tank	JFR-P627	5,897,900	5,897,900	7,500,000	7,500,000
Fianna Hills Elevated Tank	FIH-P825 RSW-P865 GLF-P715 HVC-P700 BHN-P795	745,800 72,800 135,400 81,400 63,100	1,098,500	250,000	250,000
Howard Hill Elevated Tank	RYH-P765 SPM-P001	1,093,100 36,100	1,129,200	750,000	750,000
Entire System Excluding Wholesale Customers		**31,100,000**	**31,100,000**	**42,450,000**	**41,971,000**

[1] 2031 ADD volumes exclude water sold to contract water users.

Of the 20 pressure zones in the Fort Smith distribution system, 16 pressure zones do not individually contain sufficient 24-hour net-effective water storage to serve the projected 2031 ADD and meet fire flow storage requirements in their specific zone. In most cases, Fort Smith can transfer surplus water from an adjacent pressure zone into the one with deficient storage during periods of high demand and in emergencies. Brief descriptions for all apparent 24-hour net-effective water storage deficiencies and surpluses are provided below. Note that the pressure zones are described in Section 4.5.

- The Wildcat Mountain and Luce Ground Storage Tanks can meet the 24-hour net effective storage requirements of HLW-P630 and MMY-P745 with a water storage surplus of 9,889,900 gallons.
- The Wildcat Mountain Standpipe is 585,600 gallons short of supplying 24-hours of net-effective storage for the WMS-P708 Pressure Zone. However, the Wildcat Mountain Standpipe receives water from the HLW-P630 Pressure Zone via the Wildcat Mountain Pump Station, and the HLW-P630 Pressure Zone has a water storage surplus of 9,889,900 gallons. Additionally, the Wildcat Mountain Pump Station is rated at 2,200 gpm with one (1) pump in operation and one (1) in standby, and it includes an emergency standby generator. Barring a catastrophic failure, the HLW-P630 Pressure Zone can supplement the additional water storage needed to meet the 24-hour net-effective storage requirements in WMS-P708 with a water storage surplus of 9,304,300 gallons.
- The Haven Hill Ground Storage Tank is 8,408,500 gallons short of supplying 24-hours of net-effective storage for the WAM-P660 Pressure Zone. However, the WAM-P660 Pressure Zone is also supplied from the Lake Fort Smith and Lee Creek Water Treatment Plants via transmission lines from the plants to the city limits. The four (4) clearwells at the water treatment plants include a total of 9.5 million gallons of effective storage, and excluding contract water usage, they only supply a 2031 ADD of 125,600 gpd. Consequently, the clearwells have a surplus effective storage capacity of 9,374,400 gallons that can be used to supplement the storage deficiency in the WAM-P660 Pressure Zone. Additionally, the HLW-P630 has a water storage surplus of 9,304,300 gallons after serving the HLW-P630, MMY-P745, and WMS-P708 Pressure Zones that can also be used to supplement flow to the WAM-P660 Pressure Zone.

  The finished water pump stations at each of the water treatment plants include a redundant pump, and the Lee Creek Finished Water Pump Station has an emergency standby generator. The Lake Fort Smith Water Treatment Plant and HLW-P630 Pressure Zone can supply the ADD flow to the WAM-P660 Pressure Zone by gravity flow without the need for pumping. Barring a catastrophic failure, the water treatment plant clearwells and HLW-P630 Pressure Zone can supplement the additional water storage needed to meet the 24-hour net-effective storage requirements in the WAM-P660 Pressure Zone with a water storage surplus of 10,270,200 gallons.

- The Country Club Elevated Tank is 66,000 gallons short of supplying 24-hours of net-effective storage for the CCB-P769 and BNS-P004 Pressure Zones. However, the Country Club Elevated Tank receives water from the WAM-P660 Pressure Zone via the Haven Hill Pump Station, and the WAM-P660 Pressure Zone has a water storage surplus of 10,270,200 gallons. Additionally, the Haven Hill Pump Station is rated at 1,500 gpm with one (1) pump in operation and one (1) in standby, and it includes an emergency standby generator. Barring a catastrophic failure, the WAM-P660 Pressure Zone can supplement the additional water storage needed to meet the 24-hour net-effective storage requirements in the CCB-P769 and BNS-P004 Pressure Zones with a water storage surplus of 10,204,200 gallons.
- The Crowe Hill Ground Storage Tank is 1,133,900 gallons short of supplying 24-hours of net-effective storage for the CHR-P707 Pressure Zone. However, the Crowe Hill Ground Storage Tank receives water from the WAM-P660 Pressure Zone via the Old Greenwood and Country Club Road Pump Station, and the WAM-P660 Pressure Zone has a water storage surplus of 10,204,200 gallons after providing supplemental storage for the CCB-P769 and BNS-P004 Pressure Zones. Additionally, the Old Greenwood Road and Country Club Pump Station is rated at 3,000 gpm with one (1) pump in service and one (1) in standby, and it includes an emergency standby generator. Barring a catastrophic failure, the WAM-P660 Pressure Zone can supplement the additional water storage needed to meet the 24-hour net-effective storage requirements in CHR-P707 with a water storage surplus of 9,070,300 gallons.
- The Crowe Hill Elevated Tank is 239,200 gallons short of supplying 24-hours of net-effective storage for the CRH-P820 and PCD-P003 Pressure Zones. However, the Crowe Hill Elevated Tank receives water from the CHR-P707 Pressure Zone via the Crowe Hill Pump Station. As noted previously, the net-effective storage for the CHR-P707 Pressure Zone is supplemented by the WAM-P660 Pressure Zone, which has a water storage surplus of 9,070,300 gallons after providing supplemental water storage for the CCB-P769, BNS-P004, and CHR-P707 Pressure Zones. The Crowe Hill Pump Station is only rated at 650 gpm with one (1) pump in service and one (1) in standby, but it does include an emergency standby generator. Barring a catastrophic failure, the CHR-P707 Pressure Zone, via the WAM-P660 Pressure Zone, can supplement the additional water storage needed to meet the 24-hour net-effective storage requirements in CRH-P820 and PCD-P003 with a water storage surplus of 8,831,100 gallons. However, the City of Fort Smith should consider increasing the pumping capacity of the Crowe Hill Pump Station.

  The Chaffee Crossing Ground Storage Tank can meet the 24-hour net-effective storage requirements of CHC-P645 with a water storage surplus of1,710,500 gallons.

- The Wood Elevated Tank is 45,000 gallons short of supplying 24-hours of net-effective storage for the TWD-P695 Pressure Zone. However, The Woods Elevated Tank receives water from the CHC-P645 Pressure Zone via The Woods Pump Station, and the CHC-P645 Pressure Zone has a water storage surplus of 1,710,500 gallons. Additionally, The Woods Pump Station is rated at 725 gpm with one (1) pump in service and one (1) in standby, and it includes an emergency standby generator. Barring a catastrophic failure, the CHC-P645 Pressure Zone can supplement the additional water storage needed to meet the 24-hour net-effective storage requirements in TWD-P695 with a water storage surplus of 1,665,500 gallons.
- The Jack Freeze Ground Storage Tank can meet the 24-hour net-effective storage requirements of JFR-P627 with a water storage surplus of 1,602,100 gallons.
- The Fianna Hills Elevated Tank is 848,500 gallons short of supplying 24-hours of net-effective storage for the FIH-P825, RSW-P865, GLF-P715, HVC-P700, and BHN-P795 Pressure Zones. However, the Fianna Hills Elevated Tank receives water from the JFR-P627 Pressure Zone via the Fianna Hills Pump Station, and the JFR-P627 Pressure Zone has a water storage surplus of 1,602,100 gallons. Additionally, the Fianna Hills Pump Station can supply approximately 1,800 gpm with two (2) pumps in service and one (1) in standby, and it includes an emergency standby generator. Barring a catastrophic failure, the JFR-P627 Pressure Zone can supplement the additional water storage needed to meet 24-hour net-effective storage requirements in FIH-P825, RSW-P865, GLF-P715, HVC-P700 and BHN-P795 with a water storage surplus of 753,600.
- The Howard Hill Elevated Tank is 379,200 gallons short of supplying 24-hours of net-effective storage for the RYH-P765 and SPM-P001 Pressure Zones. However, the Howard Hill Elevated Tank receives water from the JFR-P627 Pressure Zone via the Rye Hill Pump Station. The JFR-P627 Pressure Zone has a water storage surplus of 753,600 gallons after supplementing water storage for the FIH-P825, RSW-P865, GLF-P715, HVC-P700, and BHN-P795 Pressure Zones. Additionally, the Rye Hill Pump Station can supply approximately 1,600 gpm with two (2) pumps in service and one (1) in standby, and it includes an emergency standby generator. Barring a catastrophic failure, the JFR-P627 Pressure Zone can supplement the additional water storage needed to meet 24-hour net-effective storage requirements in RYH-P765 and SPM-P001 with a water storage surplus of 374,400 gallons.

The following Pressure Zones are supplied with water without having a storage tank specifically dedicated to each zone.

- The MMY-P745 Pressure Zone is served by the Moody Road Pump Station, which operates constantly to supply water and maintain a constant pressure along Moody Road in eastern Fort Smith without the need for a storage tank. The Moody Road Pump Station includes two (2) pumps that operate with variable frequency drives (VFDs) and are individually rated at 800 gpm. To supply a minimum fire flow rate of 1,000 gpm to the MMY-P745 Pressure Zone, both pumps must operate in duplex, without benefit of a redundant (standby) pump. The pump station has an emergency generator as a standby power source.

- The RSW-P865 Pressure Zone is served by the Royal Scots Booster Station, which operates with variable frequency drives to maintain constant water pressure in the eastern end of Fianna Hills. The Royal Scots Booster Station originally utilized bladder tanks in a below-ground structure for temporary storage, and the tanks were served by constant speed pumps. The constant speed pump controls have been replaced with VFDs to supply water at a constant pressure without a storage tank. The Royal Scots Booster Station is rated at 225 gpm with one (1) pump in service and one (1) in standby, and it has no emergency standby generator. The RSW-P865 Pressure Zone can also be served from the FIH-P825 Pressure Zone through three (3) separate check valves located along Canongate Way, Castleton Street, and Harrow Heath Street. These check valves only open to allow supplemental flow in the event that a fire flow demand causes the pressure to drop in RSW-P865.
- The SPM-P001 Pressure Zone is located along Spring Mountain Road south of the Fort Smith city limits. It is served by the Spring Mountain Pump Station, which uses VFDs to operate the pumps and supply water at a constant pressure to the SPM-P001 Pressure Zone without the need for a storage tank. The Spring Mountain Pump Station is rated at 110 gpm with one (1) pump in service and two (2) in standby, rated at 22 gpm and 110 gpm, respectively. The pump station includes an emergency generator as a standby power source. This part of the service area is considered a rural distribution system and is not designed to provide fire flows.

Proposed improvements are recommended in Section 8 to mitigate the water storage deficiencies relating to fire flow requirements for the MMY-P745 Pressure Zone.

7.2 Distribution System Deficiencies

7.2.1 Minimum Pressures and Fire Flow Deficiencies

The Fort Smith water distribution system was evaluated on its ability to maintain a minimum residual pressure of 20 psi for all customers during Maximum Daily Demand (MDD) flows. As shown on Figure 5 and Figure 6 at the end of this Report, most of the existing distribution system can maintain minimum residual pressures above 20 psi for both the 2021 MDD and projected 2031 MDD. Many of the pressure deficiencies are located along transmission lines, on supply piping near pump stations, or around storage tank sites, which generally operate at lower pressures. However, in most of these instances there are parallel distribution lines that serve users in these areas and provide minimum residual pressures in excess of 20 psi.

The Rye Hill area in south Fort Smith has a concentrated cluster of customers that occasionally see residual pressures below 20 psi. This area is served by several small diameter water lines, and friction head losses in these lines often cause residual pressures to drop below 20 psi during periods of peak water demand.

The Fort Smith distribution system was also evaluated on its ability to provide a minimum fire flow of 1,000 gpm to fire hydrants in residential areas and 1,500 gpm to fire hydrants in commercial and industrial areas, while maintaining a minimum residual pressure of 20 psi. As shown in Figure 7 and Figure 8 at the end of this Report, there are a number of locations in the distribution system that are deficient in meeting fire flow requirements. Most notably, the BHN-P795 Pressure Zone near the west end of Brooken Hill Drive, and the Riverlyn area near the intersection of South 74th Street and Free Ferry Road. The BHN-P795 Pressure Zone is served by two (2) 6-inch pressure reducing valves from the FIH-P825 Pressure Zone that are located on a single 6-inch dead end water line, which does not provide the necessary capacity for the entire pressure zone to meet fire flow demands. The residential area east of South 74th Street and north of Free Ferry Road is served by multiple single feed water lines from the WAM-P660 Pressure Zone, which do not provide sufficient capacity to meet fire flow demands.[8] The Riverlyn Addition is fed by a single 6-inch water line on Riverlyn Drive. Rivercrest Drive and Free Ferry Landing are fed by separate 8-inch dead end lines, and Free Ferry Street North, Kensington Way, and Kensington Court are fed by 6-inch dead end lines.

Most fire flow deficiencies can be resolved by increasing water line sizes, providing a redundant or loop feed to dead end water lines, or otherwise improving system pressures. As stated previously, some low-pressure areas are located along transmission lines, on supply piping near pump stations, and around tank sites, and thus low-pressure issues in these areas are difficult to improve. Similar to the minimum pressure deficiencies described above, most of these areas are served by parallel distribution lines that provide adequate fire flow.

The Fort Smith distribution system is generally designed to provide fire protection only within the city limits. The SPM-P001 Pressure Zone that serves the Spring Mountain area and a large portion of the RYH-P765 Pressure Zone that serves the Rye Hill area are both located outside the city limits. These areas are considered to operate as rural water distribution systems that are not typically designed to provide fire protection to the rural customers. Despite some low-

[8] Specifically, the subdivisions of Edgewater Estates and Free Ferry Landing

pressure rural areas, a large portion of the RYH-P765 Pressure Zone can provide adequate fire flow. A comprehensive list detailing the locations of fire flow deficiencies is provided in Appendix C.

The current edition of the *10 State Standards* recommends that water mains providing fire protection or serving fire hydrants be a minimum of 6 inches in diameter. Water mains where fire protection is not required shall be a minimum of 3 inches in diameter, and any departure from this requirement should be justified by hydraulic analysis.[9]

As shown in Table 4.1, the existing water system includes approximately 78 miles of water line that are 3 inches in diameter and smaller. While some small diameter water lines may be capable of delivering the 2031 ADD flows while maintaining residual pressures above 20 psi, hydraulic analysis shows that most small diameter lines must be upsized to meet fire flow requirements. In addition, aging water lines contribute to increased water loss and operation and maintenance expenses due to frequent repairs of leaks and breaks. Interior corrosion in smaller line sizes also require that they be operated at higher pressures to overcome increased friction head loss.

Based on a review of the pipe materials input in the hydraulic water model, there are approximately seven (7) miles of galvanized steel piping in the Fort Smith distribution system. Galvanized pipes are known to suffer from the effects of corrosion and tuberculation, which can cause significant pressure losses, uneven water distribution, discolored water, and leaks. Section 8 will present proposed improvements for the replacement of these galvanized steel and undersized water lines to address low residual pressures and deficiencies in delivering fire flows (see Figures 5 through 8 for locations).

The City of Fort Smith has identified a particular brand of fire hydrant in the distribution system that is difficult to operate and maintain due to its age and the inability to obtain spare parts. The Fort Smith distribution system contains a large number of "Corey" fire hydrants that were manufactured by the Rensselaer Valve Manufacturing Co. of New York presumably prior to the 1940s. Water system records show several small Corey hydrants (4 and 5-inch size) installed in the downtown area, some of which were installed as early as the 1920s. Section 8 will include recommendations for the replacement of these fire hydrants.

7.2.2 Downtown Pressure Zone

To prolong the useful life of older cast iron water lines in the distribution system and to minimize leaks due to over-pressurizing or surging when supplying fire flows, the City has identified the need for a reduced pressure zone in the downtown area of Fort Smith. This Downtown Reduced Pressure Zone will encompass approximately 400 city blocks (1.9 square miles) and be isolated from the WAM-P660 Pressure Zone that presently serves the downtown area. Isolation of the distribution system will require the closure of line valves around the periphery, and installation of at least two (2) pressure reducing valves to lower the water system's hydraulic grade from the 660-ft. pressure zone to a new 580-ft. pressure zone.

[9] Great Lakes -- Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, *Recommended Standards for Waterworks, 2018 Edition* (St. Paul: Minnesota's Bookstore), 131.

Closure of the isolation valves will also create several dead-end water line extensions that will require the installation of additional piping extensions to maintain loop feed of the water supply for fire flow and water quality purposes. Hydraulic analysis has shown that establishing this reduced pressure zone can be accomplished without creating any minimum pressure or fire flow deficiencies for current or future demand projections.

8 Recommended Water Distribution System Improvements

8.1 New 48-Inch Transmission Line Integration

As noted in Section 4.3.3, the City of Fort Smith is currently constructing a new 48-inch transmission line that will transfer water from the Lake Fort Smith Water Treatment Plant to the City of Fort Smith, replacing an existing 27-inch transmission line constructed during the 1930s. The new 48-inch transmission line will connect on the southeast side of Fort Smith near Chaffee Crossing, and it will primarily supply water to the southern half of the water system and specifically the areas south of Phoenix Avenue.

In January 2022, Hawkins-Weir Engineers, Inc. prepared a Memorandum for the City that detailed the recommended improvements to the Fort Smith distribution system for integration of the new 48-inch transmission line into the water distribution system. A copy of the 48-Inch Transmission Line Integration Memorandum is included as Appendix D.

Integration of the new 48-inch transmission line into the Fort Smith distribution system will require the following recommended improvements:

- **Painter Lane 12-inch Water Line and East Point Drive Pressure Reducing Valve (serving MMY-P745)** – Installation of 4,800 LF of 12-inch water line to serve the MMY-P745 Pressure Zone currently served by the Moody Road Pump Station. The proposed 12-inch water line will connect to the new 48-inch transmission line near the intersection of Frontier Road and Wells Lake Road and will connect to the MMY-P745 Pressure Zone at the intersection of Painter Lane and Moody Road. Higher system pressures caused by lower elevations along East Pointe Drive (in the southeast corner of the MMY-P745 Pressure Zone) will require the installation of a 3-inch pressure reducing valve on the existing water line along Painter Lane between Shadow Branch Lane and East Pointe Drive. Connection of this pressure zone to the 48-inch transmission line will allow the Moody Road Pump Station to be placed in standby. **Estimated Cost: $1,440,000**
- **Highway 255 12-inch Water Line and Pressure Reducing Valve (serving HLW-P630)** – Installation of a 12-inch pressure reducing valve at the intersection of South Zero Street and Painter Lane to serve the HLW-P630 Pressure Zone via a 12-inch water line installed as part of the Highway 255 Utility Relocations Project (Project 19-10-C1). This project will connect to the proposed 12-inch water line serving the MMY-P745 Pressure Zone, and the resulting connection to the new 48-inch transmission line will serve as a secondary feed to the HLW-P630 Pressure Zone. **Estimated Cost: $320,000**
- **The Woods Tank Pressure Reducing/Flow Control Valve (serving TWD-P695)** – Installation of a 12-inch pressure reducing/flow control valve on the existing 12-inch water line between Massard Road and The Woods Tank to serve the TWD-P695 Pressure Zone. This will allow The Woods Pump Station to be placed in standby. **Estimated Cost: $350,000**

- **Chaffee Crossing/Massard Road Pressure Reducing/Flow Control Valve (serving HLW-P630)** – Installation of a 30-inch Pressure Reducing/Flow Control Valve at the Chaffee Crossing Pump Station to serve the HLW-P630 Pressure Zone. This valve will be used to supplement flow to the Wildcat Mountain Ground Storage Tank via the Massard Road 30-inch transmission line. This will also serve as a secondary feed to the HLW-P630 Pressure Zone (specifically for the Wildcat Mountain Tank), with primary service being supplied from the north. To address potential water age issues in a short section of the Massard Road Transmission Line between Huntington Way and the Chaffee Crossing Pump Station, the flow control feature would open the valve to flush water back into the north system and remain open based on a timer. **Estimated Cost: $940,000.**
- **Chaffee Crossing/Geren Road Pressure Reducing/Flow Control Valve (serving JFR-P627)** – Installation of a 24-inch pressure reducing/flow control valve at the Chaffee Crossing Pump Station to serve the JFR-P627 Pressure Zone via the Geren Road 24-inch Transmission Line. This valve will allow the Brooks-Stephins Pump Station to be placed in standby. In the event the new 48-inch transmission line were out of service, the system would revert to its current operation with the Brooks-Stephins Pump Station supplying water to the Jack Freeze Ground Storage Tank (JFR-P627 Pressure Zone). Without the Brooks-Stephins Pump Station, the HLW-P630 Pressure Zone will not be able to fill the Jack Freeze Tank, resulting in reduced pressures in the JFR-P627 Pressure Zone. **Estimated Cost: $750,000**
- **Brooks-Stephins/Highway 45 Flow Control Valve (serving HLW-P630)** – Installation of a 20-inch flow control valve immediately north of the Brooks-Stephins Pump Station to serve the HLW-P630 Pressure Zone. This valve will be used to supplement flow to the Luce Tank via the 20-inch transmission line between the Luce Tank and the Brooks-Stephins Pump Station. This will serve as a secondary feed to the HLW-P630 Pressure Zone (specifically for the Luce Tank) if primary supply from the north side of Fort Smith is interrupted. To address potential water age issues in the short section of water line north of the Brooks-Stephens pump station, the flow control feature would open the valve to flush water back into the north system and remain open based on a timer. **Estimated Cost: $640,000**
- **Chaffee Crossing Tank Pressure Reducing/Flow Control Valve (serving CHC-P645)** – Installation of pressure reducing and flow control improvements to an existing control valve near the Chaffee Crossing Tank to serve the CHC-P645 Pressure Zone, and to allow the Chaffee Crossing Pump Station to be placed in standby. In the event the new 48-inch transmission line were out of service, the system could revert to its current operation with the HLW-P630 Pressure Zone serving the CHC-P645 Pressure Zone. Without the Chaffee Crossing Pump Station, the HLW-P630 Pressure Zone will not be able to fill the Chaffee Crossing Ground Storage Tank and will result in reduced pressures in the CHC-P645 Pressure Zone. **Estimated Cost: $110,000**
- **Reatta 8-inch Water Line (primary feed from CHC-P645)** – Installation of approximately 800 LF of 8-inch water line to serve the Reatta Subdivision, located just southwest of the Chaffee Crossing Pump Station, from the CHC-P645 Pressure Zone. The water line will connect to the Chaffee Crossing Tank fill line and will extend north

approximately 800 feet to connect to an existing 8-inch water line along the west side of Massard Road and provide loop feed to the Reatta Subdivision. **Estimated Cost: $200,000**

- **Reatta 8-inch Water Line (secondary feed from JFR-P627)** – Installation of 300 LF of 8-inch water line and a check valve to provide a secondary feed to the Reatta Subdivision from the JFR-P627 Pressure Zone. The water line will connect to the Geren Road 24-inch transmission line just north of the Chaffee Crossing Pump Station and will connect to the existing 8-inch water line that serves the Reatta Subdivision at the intersection of Massard Road and Cisterna Way. The current feed to the Reatta Subdivision will need to be closed to avoid serving the area with transmission line pressure. **Estimated Cost: $140,000**
- **Planters Road 24-inch Water Line and Pressure Reducing/Flow Control Valve** – Installation of approximately two (2) miles of 24-inch water line to extend along Planters Road from Massard Road to Highway 45 and a pressure reducing/flow control valve to be located near the intersection of Planters Road and Highway 45. These improvements will provide water service to a presently unserved/underserved industrial area along Planters Road, and the pressure reducing/flow control valve will allow higher pressures along Planters Road than are available from the JFR-P627 pressure plane. In addition, this line will provide a redundant feed into the JFR-P627 Pressure Zone along Highway 45. This valve will need to include flow control features that are identical to the Chaffee Crossing/Geren Road 24-inch pressure reducing/flow control valve. **Estimated Cost: $8,480,000**

Note that the 24-inch water line extension and pressure reducing/flow control valve station for Planters Road is not necessary for the integration of the new 48-inch transmission line. Due to the higher pressure gradient available in the 48-inch transmission line, construction of the 24-inch water line extension and control valve station between Arkansas State Highway 45 and Massard Road would allow the industrial properties along the Planters Road route to be served at a higher pressure than currently available. The total estimated cost of the 48-inch Transmission Line Integration projects is $4,890,000 without the Planters Road extension and $13,370,000 if the 24-inch transmission line along Planters Road is included. See the summary of proposed project costs in Section 8.5.

8.2 Water Storage Improvements

Water storage deficiencies related to 24-hour net-effective water storage and fire protection are described in Section 7.1. As noted previously, 16 of the 20 pressure zones in the Fort Smith Water System do not individually have sufficient 24-hour net-effective storage volume within their specific zone for the 2031 ADD. In most cases, surplus water can be supplied from adjacent pressure zones to supplement the storage deficiencies, and some deficiencies will be further mitigated with the completion of the 48-inch transmission and other capital improvements described in Section 8.4.

The following 24-hour, net-effective storage deficiencies require further consideration by the City of Fort Smith, particularly with respect to the probability of a storage tank being removed from service for maintenance or recoating, and the potential need to supply water to pressure

zones with only the available pumping capacity of the associated pump station. Operational and maintenance procedures may need to be adjusted, and/or the purchase of additional standby equipment may be necessary to maintain adequate supply when a water storage tank is removed from service.

- **Crowe Hill Pump Station Improvements** – The Crowe Hill Elevated Tank is 239,200 gallons short of supplying 24-hours of net-effective storage for the CRH-P820 and PCD-P003 Pressure Zones. Additional tank storage is not recommended at this time due to the surplus storage available in the system. Currently, the Crowe Hill Elevated Tank receives water from the CHR-P707 Pressure Zone via the Crowe Hill Pump Station. As noted previously, the net-effective storage for the CHR-P707 Pressure Zone is supplemented by the WAM-P660 Pressure Zone, which has enough surplus net-effective water storage to meet 2031 ADD for the CRH-P820 and PCD-P003 Pressure Zones. However, the Crowe Hill Pump Station is rated at only 650 gpm with one (1) pump in service and one (1) in standby. In the event the Crowe Hill Elevated Tank is removed from service, the pump station will have difficulty in simultaneously supplying water for the ADD and a 1,500 gpm commercial/industrial fire flow demand in the CRH-P820 and PCD-P003 Pressure Zones. Consideration should be given to increasing the pumping capacity of the Crowe Hill Pump Station to a minimum of 1,500 GPM to meet commercial/industrial fire flow demand. **Estimated Cost: $290,000**

- **The Woods Pump Station Improvements** – The Woods Elevated Tank is 45,000 gallons short of supplying 24-hours of net-effective storage. Additional tank storage is not recommended at this time due to the small amount of deficit storage and the availability of surplus storage in the system. However, The Woods Pump Station is rated at only 750 gpm with one (1) pump in service and one (1) in standby. In the event The Woods Elevated Tank is removed from service, the pump station may have difficulties simultaneously supplying water for the ADD and a minimum 1,000 gpm fire flow demand in the TWD-P695 Pressure Zone.

  Construction of a pressure reducing valve to connect the TWD-P695 Pressure Zone to the new 48-inch transmission line is described in Section 8.1, which will allow the Woods Pump Station to be placed in standby. While these proposed improvements will mitigate the need to increase the storage volume of The Woods Tank, the City of Fort Smith should consider the purchase of a spare pump for The Woods Pump Station in the interim, since no additional operational improvements have been developed for The Woods Elevated Tank or Pump Station. Estimated costs for the PRV to place The Woods Pump Station in standby are included in the 48-inch transmission line integration detailed in Section 8.1, and no additional water storage improvements are recommended to The Woods Elevated Tank.

- **Fianna Hills Water Storage Improvements –** The Fianna Hills Elevated Tank is 848,500 gallons short of supplying 24-hours of net-effective storage for the FIH-P825, RSW-P865, GLF-P715, HVC-P700, and BHN-P795 Pressure Zones.

  Construction of a new Jack Freeze Elevated Tank to serve the GLF-P715, HVC-P700 and BHN-P795 Pressure Zones, as described in Section 8.4, will reduce the storage deficit in the Fianna Hills Elevated Tank by 279,900 gallons. The City has acknowledged difficulties in locating an adequate site for a new water storage tank in

the established Fianna Hills area. Consequently, no additional water storage improvements are included in this Report for the FIH-P825 and RSW-P865 pressure zones at this time (see discussion of Royal Scots Booster Station below).

- **Royal Scots Booster Station Improvements** – The RSW-P865 Pressure Zone does not include any water storage, and the City has acknowledged difficulties in locating an adequate site for a new storage tank in this established Fianna Hills residential subdivision.

  The City has confirmed the ability of the RSW-P865 Pressure Zone to provide adequate fire flow, however, it requires the use of both pumps and additional flow from the FIH-P825 Pressure Zone be provided through the three (3) check valves described in Section 4.5.15. Due to the need for both pumps to operate to satisfy fire flow demands, the City should consider the purchase of a spare pump for the Royal Scots Way Booster Station and the installation of a generator for a standby power source. Due to the difficulties in locating an adequate site for a new storage tank, the estimate for proposed improvements only includes costs associated with the purchase of a spare pump and the installation of a generator at the site. **Estimated Cost: $90,000**.

- **Howard Hill Water Storage Improvements** – The Howard Hill Elevated Tank is 379,200 gallons short of supplying 24-hours of net-effective storage for the RYH-P765 and SPM-P001 Pressure Zones. Additional tank storage is not recommended at the Howard Hill Elevated Tank due to the surplus storage available in the system.

  Construction of the Chad Colley and Rye Hill 24-Inch Transmission Line to connect the RYH-P765 Pressure Zone to the new 48-inch transmission line is described below in Section 8.4. This proposed improvement will eliminate the need to construct an additional 3 MG of water storage at Howard Hill and 3.2 miles of 30-inch water line, which currently are included in the Fort Smith Capital Improvement Program (CIP). It should be noted that the Rye Hill Pump Station is rated at approximately 1,600 gpm with two (2) pumps in service and one (1) in standby, and no additional capital improvements have been considered for the Howard Hill Elevated Tank or Rye Hill Pump Station.

- **Moody Road Pump Station Improvements** – The MMY-P745 Pressure Zone is served only by the Moody Road Pump Station, which is rated at 800 gpm with one (1) pump in service and one (1) in standby. Construction of improvements to connect the MMY-P745 Pressure Zone to the new 48-inch transmission line is described in Section 8.1, which would allow the area to be served off the higher hydraulic grade supplied by the transmission line. While these proposed improvements will mitigate the need to construct water storage improvements for the pressure zone or pumping capacity improvements to the Moody Road Pump Station, the City of Fort Smith should consider the purchase of a spare pump for the pump station in the interim. No additional operational improvements have been considered for the MMY-P745 Pressure Zone, and a water storage tank for MMY-P745 are recommended.

Proposed water storage improvements to satisfy 24-hour net-effective storage deficiencies in individual pressure zones must consider the potential effects on existing storage tanks. Because the Fort Smith distribution system has ample water storage overall, additional storage

in most of these areas would reduce demand on existing water storage tanks in the system, limit fresh water turnover, and possibly lead to water quality issues (e.g., water stratification, water age, low chlorine residuals, disinfection by-products, etc.).

8.3 Distribution System Piping Improvements

Pressure and fire flow deficiencies caused by aging and undersized water lines are detailed in Section 7.2. Improvements for replacing undersized and aging water lines and addressing system pressure issues were developed using the hydraulic water model and are described as follows:

- **Small Diameter Water Line Replacement** – Approximately 30,000 LF (5.7 miles) of small diameter water lines have been identified for replacement to resolve minimum pressure and fire flow deficiencies in the Fort Smith distribution system. Except for the system improvements for the Rye Hill area, the replacement of small diameter water lines is generally governed by the need to improve fire flow capabilities, i.e., improvements to resolve fire flow deficiencies also resolve minimum pressure deficiencies. **Estimated Cost: $7,000,000**
- **Galvanized Steel Water Line Replacement** – Improvements for replacing aging water lines were limited to replacing all galvanized steel piping, and approximately 37,000 LF (7 miles) of galvanized steel piping has been identified for replacement. **Estimated Cost: $8,640,000**
- **Fire Hydrant Replacement** – The City has identified approximately 250 "Corey" fire hydrants to be replaced across the distribution system, most of which are located in the downtown area of Fort Smith. These hydrants have exceeded their useful operation life, and maintenance and repair of these hydrants are difficult. **Estimated Cost: $2,680,000**
- **Downtown Reduced Pressure Zone** – As discussed in Section 7.2, the City has identified the need for the Downtown Reduced Pressure Zone. Improvements include installation of a 20-inch PRV, a 24-inch PRV, and new isolation valves along the periphery of the pressure zone. Closure of isolation valves will the installation of additional piping extensions along the periphery of the pressure zone to maintain loop feed of the water supply for fire flow and water quality purposes. **Estimated Cost: $3,480,000**
- **Fire Protection Improvements (Redundant Feeds)** – The remaining fire flow deficiencies not addressed by the improvements detailed above are primarily caused by dead-end service feeds. Providing a redundant feed to dead-end water lines resolved most of the remaining fire flow deficiencies. Completing looped feeds that cannot provide sufficient fire flow includes the installation of approximately 13,000 LF (2.5 miles) of 6-inch diameter water line. **Estimated Cost: $3,040,000**

Figure 9 at the end of this Report shows that the proposed improvements detailed in this Section resolve minimum pressure deficiencies in most areas. The apparent remaining minimum pressure deficiencies are located along transmission lines, on supply piping near pump station, or around tank sites. As noted in Section 7.2, in most of these instances there are parallel

distribution lines that serve users in these areas and provide minimum residual pressures in excess of 20 psi.

Figure 10 at the end of this Report shows that the proposed improvements detailed in this Section also resolve fire flow deficiencies in most areas. As noted previously, the system is not designed to provide fire flow to areas outside city limits and therefore no improvements were recommended to resolve those deficiencies.

8.4 Capital Improvements

The remainder of the proposed improvements are considered capital improvements that are primarily projects identified by the City. These projects were developed from the current capital improvements list and other maintenance related deficiencies not detectable through hydraulic analysis. A list of proposed capital improvements, with a brief description of the project and its need is provided below. Note that some quantities have been revised based on piping lengths derived from the water model.

- **Jack Freeze Elevated Tank, Pump Station, and Brooken Hill 12-Inch Water Line** – This project includes the construction of a 350,000-gallon (0.35 MG) Jack Freeze Elevated Tank, a Jack Freeze Pump Station minimally rated at 500 gpm, and approximately 8,000 LF of 12-inch water line along Brooken Hill Drive from the existing Jack Freeze Ground Storage Tank site to Bellhaven View. The GLF-P715, HVC-P700 and the BHN-P795 Pressure Zones will be served by the new Jack Freeze Elevated Tank, which will reduce the 24-hour net-effective storage deficit at the Fianna Hills Elevated Tank by 350,000 gallons (based on the 2031 ADD). **Estimated Cost: $5,950,000**

- **North "N" Street 24-Inch Transmission Line Improvements –** This project includes the construction of approximately 15,500 (LF) of 24-inch transmission line from the intersection of North "N" Street and 50th Street, across Rogers Avenue, to the intersection of South "D" Street and Lexington Avenue. This project is primarily replacing an existing 22-inch diameter steel water line that breaks frequently due to age-related corrosion issues. **Estimated Cost: $11,690,000**

- **Tennessee Ridge Road 12-Inch Water Line –** This project includes the construction of approximately 20,000 LF of 12-inch water line to replace an existing 3-inch water line along Tennessee Ridge Road southwest of U.S. Highway 71 and complete a loop feed connection at Arkansas Highway 45. This project is necessary to accommodate future growth at the southern edge of the City's service area. **Estimated Cost: $5,220,000**

- **Chaffee Crossing 18-Inch Transmission Line Relocation –** This project includes the construction of approximately 4,100 LF of 18-inch transmission line and 800 LF of 6-inch water line to replace an existing 18-inch transmission line located on Fort Chaffee. Currently, Fort Smith Utility Department staff are required to obtain permission from military personnel at the Arkansas National Guard base to perform maintenance and repairs on the existing transmission line. This results in significant delays in addressing maintenance issues on base property and other portions of the distribution system connected to Fort Chaffee. **Estimated Cost: $2,760,000**

- **Chad Colley and Rye Hill 24-Inch Transmission Line** – This project includes the construction of approximately 16,200 LF of 24-inch transmission line, and it replaces a previous capital improvements project for a 3 MG water storage tank and transmission line along Howard Hill Road. Based on water model analysis and projected growth estimates, the distribution system is expected to have sufficient water storage in south Fort Smith, and construction of a second tank in the Howard Hill area could lead to potential water quality problems due to water age. However, the proposed 24-inch transmission line is necessary to provide a redundant water feed to the south side of the system. Construction of the 24-inch transmission line is not recommended until the completion of the proposed 48-inch diameter transmission line to the southeast side of Fort Smith near Chaffee Crossing. **Estimated Cost: $11,980,000**
- **Contract Water Users Pump Station Improvements** – This project includes the addition of a fourth pump at the Contract Water Users Pump Station. Fort Smith Utility Department staff expressed the need for the additional pump as it will allow for more operational flexibility and the removal of a single pump for maintenance while maintaining equipment redundancy. **Estimated Cost: $80,000**
- **Towson Avenue Transmission Line Relocation (20-20-ED1)** – This project includes the relocation of approximately 6,800 LF of 20-inch water line. The existing water line is located along Townson Avenue between Dodson Avenue and South "U" Street and will be relocated to South 17th Street between Dodson Avenue and South "U" Street. **Estimated Cost: $15,000,000**

As noted in Section 8.1, proposed water distribution system improvements are identified on Figure 11, and cost estimates are summarized in Section 8.5 and in Table 9.1.

Although not considered a capital improvement, one (1) additional cost is included in this Report for transmission line repairs. In 1968, the City of Fort Smith installed a new 30-inch water transmission line across the Arkansas River, from Van Buren into Fort Smith (see Subsection 4.3.3). The 30-inch steel transmission line is attached to the underside of the Midland (U.S. 64/71B) Bridge, and it has developed a leak on the horizontal section of pipe on the Van Buren side of the River.

- **Midland Bridge 30-Inch Transmission Line Leak Repair** – This project includes the removal of a leaking 30-inch steel fitting from underneath the Midland Bridge and installation of a restrained, flexible expansion joint fitting. **Estimated Cost: $817,000.**

8.5 Cost Estimate Summary

Table 8.1, on the following page, provides a summary of the conceptual cost estimates developed for this Report. Unless otherwise noted, all costs include a 25% contingency to account for unknown construction issues, and another 16% is included to account for engineering design and construction phase services. These estimates do not include any costs related to property or easement acquisition and are presented in 2022 dollars.

Proposed improvements to the Fort Smith distribution system are divided into four (4) major categories in Table 8.1 and have a total overall estimated cost of $92,087,000.

- 48-inch Transmission Line Integration: $13,370,000
- Water Storage Improvements: $380,000
- Distribution Piping Improvements: $24,840,000
- Capital Improvements: $53,497,000

9 Water Treatment Plant and Water Transmission Line Improvements

9.1 Lake Fort Smith Water Treatment Plant Improvements

As noted previously, an evaluation of Fort Smith's two (2) water treatment plants located in Crawford County and the water transmission line system is not included in this Report. However, the City of Fort Smith has identified improvements to the treatment and transmission portions of the Fort Smith Water System that are critical for the continued ability to provide potable water to both retail and wholesale customers.

The Lake Fort Smith Water Treatment Plant in Mountainburg, Arkansas is currently sized and permitted to treat up to 40 MGD of water, which is transmitted to contract water users in Crawford and Sebastian Counties and to the Fort Smith distribution system via existing 27-inch and 36-inch transmission lines. To provide for future water demands, the City of Fort Smith intends to construct a series of expansions to the Lake Fort Smith Water Treatment Plant that will achieve an ultimate build-out capacity of 70 MGD. The City of Fort Smith has begun preplanning for the first phase of this expansion, which will increase the treatment capacity from 40 to 50 MGD. The first 10-MGD expansion project for the **Lake Fort Smith Water Treatment Plant** is currently estimated to cost **$44,000,000** and is tentatively scheduled for completion by 2031.[10] A new standby generator is also scheduled for installation at the **Lake Fort Smith Water Treatment Plant** in 2022 at an estimated cost of **$2,500,000**.

9.2 New 48-inch Transmission Line Improvements

In addition to considering the next expansion phase of the Lake Fort Smith Water Treatment Plant, planning and construction are also underway on a new 48-inch transmission line from the treatment plant to the city limits of Fort Smith. This new 48-inch transmission line will replace the existing 27-inch transmission line that was constructed in 1926 (see Section 4.3), and approximately six (6) miles of new 48-inch transmission line (Phase 1) have recently been completed near Mountainburg. Capital Improvement Projects for the next four (4) phases of the Lake Fort Smith 48-inch Transmission Line are currently under design, and descriptions of each phase are provided below. Estimated construction costs include easement acquisitions and contingencies (20%).

- **Lake Fort Smith 48-inch Transmission Line (Phase 2)** – This project includes the construction of approximately 12 miles of 48-inch transmission line in Crawford County that will generally follow Frog Bayou through the town of Rudy to the east side of the City of Van Buren. This project is currently estimated to cost **$56,892,000** and is scheduled for completion by 2026.[11]

[10] Estimated project costs and completion schedules for the first phase of the proposed expansion of the Lake Fort Smith Water Treatment Plant are taken from the Ten Year (2022-2031) Capital Improvements Plan – Water for the City of Fort Smith, approved by the Fort Smith Board of Directors on December 2, 2021.

[11] Estimated project costs and completion schedules for the four (4) remaining phases of the proposed 48-inch transmission line are taken from the Ten Year (2022-2031) Capital Improvements Plan – Water for the City of Fort Smith, approved by the Fort Smith Board of Directors on December 2, 2021.

- **Lake Fort Smith 48-inch Transmission Line (Phase 3)** – This project includes the construction of approximately 10 miles of 48-inch transmission line in Crawford County from the east side of the City of Van Buren, south across I-40 and U.S. 64 to the north bank of the Arkansas River. This project is currently estimated to cost **$41,954,000** and is scheduled for completion by 2028.
- **Lake Fort Smith 48-inch Transmission Line (Phase 4)** – This project includes construction of approximately 0.4 mile of 48-inch transmission line that will cross the Arkansas River north of the City of Barling, Arkansas. This project is currently estimated to cost **$14,634,000** and is scheduled for completion by 2030.
- **Lake Fort Smith 48-inch Transmission Line (Phase 5)** – This project includes the construction of approximately 5 miles of 48-inch transmission line through the City of Barling and Chaffee Crossing to a connection point on the southeast side of the Fort Smith distribution system. This project is currently estimated to cost **$27,210,000** and is scheduled for completion by 2028. Section 8.1 of this Report includes a discussion of proposed distribution system improvements necessary to integrate the connection of the new 48-inch transmission line in Fort Smith.

9.3 Evaluation of Completion Milestones

The continued ability of the City of Fort Smith to meet their commitments as a regional water supplier will require the timely completion of the planned expansion at the Lake Fort Smith Water Treatment Plant and the completion of the 48-inch water transmission line between Mountainburg and Fort Smith. In order to evaluate the milestone schedules proposed in the 2021 Ten Year Capital Improvements Plan (CIP), long-term distribution system simulations were modeled to identify potential trigger events affecting the ability of the Fort Smith Water System to meet future water demands.

Two (2) scenarios were evaluated with the water model to address the following questions:

1. When must the first 10-MGD upgrade be completed at the Lake Fort Smith Water Treatment Plant, and
2. When will water transmission flow rates require that the 48-inch water transmission line be fully operational?

The evaluation of the 10-MGD water plant expansion assumes that the current capacity of the Lake Fort Smith Water Treatment Plant is 40 MGD, and the net firm yield of the Lee Creek Reservoir is 10 MGD, for a combined, equivalent treatment capacity of 50 MGD. Assuming an average annual water demand growth rate of 1.5%, the projected Average Daily Demand (ADD) will exceed 50 MGD in 2042, and the Maximum Daily Demand (MDD) will exceed 50 MGD in 2027.[12] In order to meet the projected MDD demand, it is recommended that the design and construction of the first 10-MGD upgrade at the Lake Fort Smith Water Treatment Plant be accelerated to insure completion by 2027.

[12] See Section 3.3 – Population Projections (p. 9)

The evaluation of a trigger date for the completion of the 48-inch transmission line project from Lake Fort Smith included the following assumptions:

- A constant flow rate of 9,260 gpm was assumed from the Lee Creek Water Treatment Plant, which is equivalent to 10 million-gallons delivered over an 18-hour day (or 10 MGD).
- A minimum hydraulic gradient of 640 feet must be maintained in the transmission lines just upstream of the pressure reducing station on the north side of Fort Smith on Waldron Road.
- Pumps at the Lake Fort Smith Finished Water Pump Station will operate continuously, assuming that one of the largest pumps is maintained in standby (i.e., not in operation).

Hydraulic model results indicate that the existing transmission lines can deliver 41 MGD from the Lake Fort Smith Water Treatment Plant while maintaining a hydraulic gradient of 640 feet at the connection to the Fort Smith distribution system. Adding 10 MGD from the Lee Creek Water Treatment Plant yields a combined flow of 51 MGD. Assuming the same average annual demand growth rate of 1.5%, the projected ADD will exceed 51 MGD in 2043, and the projected MDD will exceed 51 MGD in 2028.

Therefore, completing the 48-inch transmission line by the Ten Year CIP milestone of 2030 will be adequate to meet Average Daily Demands. However, an incomplete transmission line system may not adequately convey water to the Fort Smith distribution system beyond 2028 if considering a projected Maximum Daily Demand for water. Although the capacity of the combined transmission lines will improve as individual phases are completed, it is recommended that the City of Fort Smith accelerate the design and construction of the 48-inch transmission line so it is completed by 2027 in conjunction with the recommended completion of the first upgrade at the Lake Fort Smith Water Treatment Plant.

If Maximum Daily Demand peaks occur infrequently, the water storage in the Fort Smith distribution system may be sufficient to overcome any short-term water supply deficiencies. However, if the frequency of peak water usage increases, such as during summertime drought conditions, it may be necessary to institute water conservation measures until the 48-inch transmission line is completed.

9.4 Cost Estimate Summary

Preliminary cost estimates for the proposed improvements to the Lake Fort Smith Water Treatment Plant and the remaining four (4) phases of the new 48-inch transmission line are summarized below.

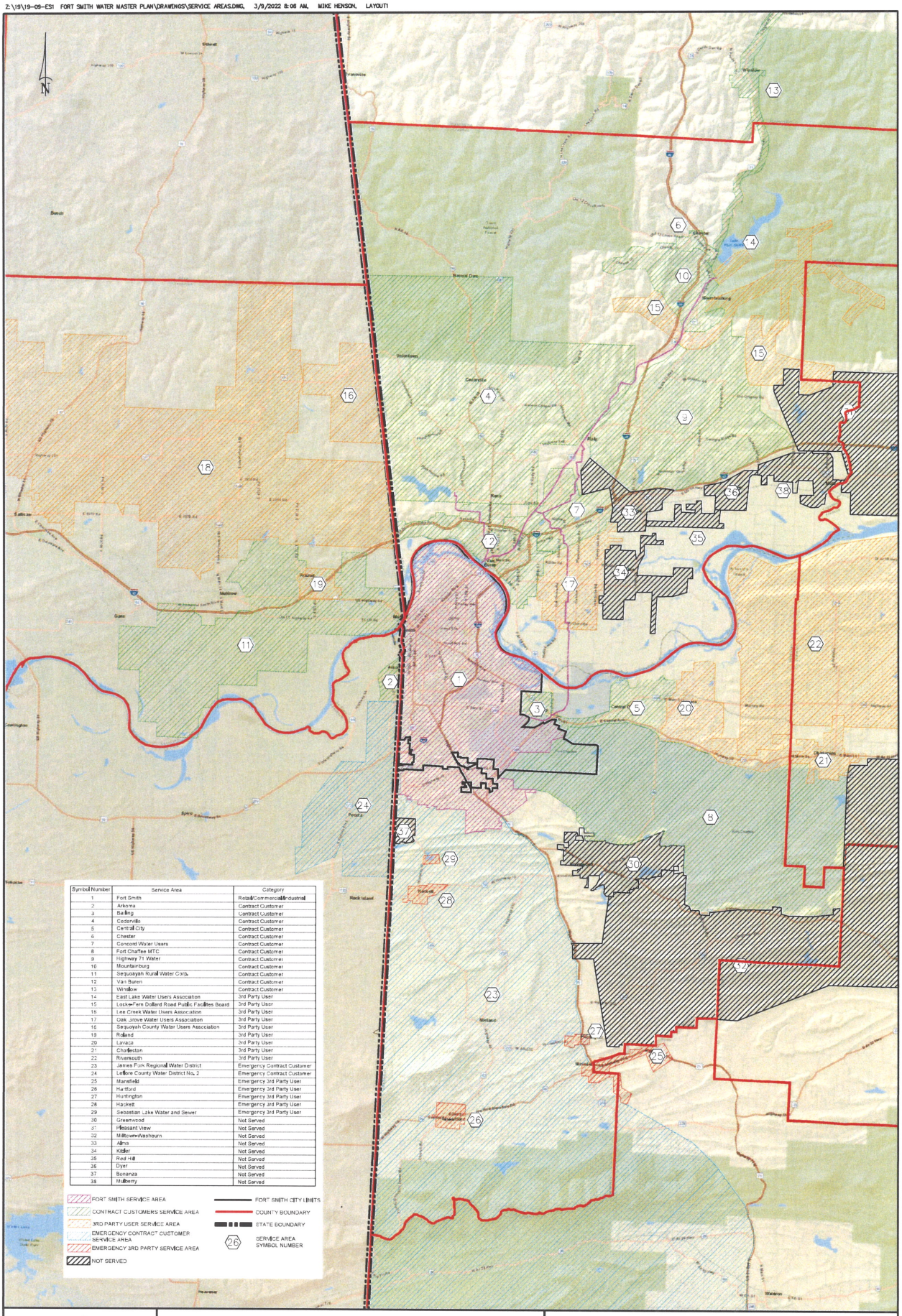
- **Lake Fort Smith Water Treatment Plant**, 10-MGD Plant Expansion and Standby Generator: **$46,500,000**
- **48-inch Transmission Line** (Phases 2-5): **$140,690,000**

Table 9.1
Fort Smith Water System Master Plan
Cost Estimates

Project Description	Total
48-Inch Transmission Line Integration	**$13,370,000**
Painter Lane 12-in. Water Line and East Point Drive PRV (Serving MMY-P745)	$1,440,000
Highway 255 12-in. Water Line and PRV (Serving HLW-P630)	$320,000
The Woods Tank PRV/FCV (Serving TWD-P695)	$350,000
Chaffee Crossing/Massard Road PRV/FCV (Serving HLW-P630)	$940,000
Chaffee Crossing/Geren Road PRV/FCV (Serving JFR-P627)	$750,000
Brooks-Stephins/Highway 45 FCV (Serving HLW-P630)	$640,000
Chaffee Crossing Tank PRV/FCV (Serving CHC-P645)	$110,000
Reatta 8-in. Water Line (Primary feed from CHC-P645)	$200,000
Reatta 8-in. Water Line (Secondary feed from JFR-P627)	$140,000
Planters Road 24-in. Water Line and PRV/FCV	$8,480,000
Water Storage Improvements	**$380,000**
Crowe Hill Pump Station Improvements	$290,000
Royal Scots Booster Station	$90,000
Distribution System Piping Improvements	**$24,840,000**
Small Diameter Water Line Replacement	$7,000,000
Galvanized Steel Water Line Replacement	$8,640,000
Fire Hydrant Replacement	$2,680,000
Downtown Reduced Pressure Zone	$3,480,000
Fire Protection Improvements (Redundant feeds)	$3,040,000
Capital Improvements	**$53,497,000**
Jack Freeze Elevated Tank, Pump Station, and Brooken Hill 12-Inch Water Line	$5,950,000
North "N" Street 24-Inch Transmission Line Improvements	$11,690,000
Tennessee Ridge Road 12-Inch Water Line	$5,220,000
Chaffee Crossing 18-Inch Transmission Line Relocation	$2,760,000
Chad Colley and Rye Hill 24-Inch Transmission Line	$11,980,000
Contract Water Users Pump Station Improvements	$80,000
Towson Avenue Transmission Line Relocation	$15,000,000
Midland Bridge 30-Inch Transmission Line Leak Repair	$817,000
Lake Fort Smith Water Treatment Plant 10-MGD Upgrade	**$46,500,000**
48-Inch Transmission Line, Phases 2-5	**$140,690,000**
Total Estimated Cost of Projects	**$279,277,000**

Figures

Z:\19\19-09-ES1 FORT SMITH WATER MASTER PLAN\DRAWINGS\SERVICE AREAS.DWG, 3/9/2022 8:06 AM, MIKE HENSON, LAYOUT1



Symbol Number	Service Area	Category
1	Fort Smith	Retail/Commercial/Industrial
2	Arkoma	Contract Customer
3	Barling	Contract Customer
4	Cedarville	Contract Customer
5	Central City	Contract Customer
6	Chester	Contract Customer
7	Concord Water Users	Contract Customer
8	Fort Chaffee MTC	Contract Customer
9	Highway 71 Water	Contract Customer
10	Mountainburg	Contract Customer
11	Sequoyah Rural Water Corp.	Contract Customer
12	Van Buren	Contract Customer
13	Winslow	Contract Customer
14	East Lake Water Users Association	3rd Party User
15	Lockes-Fern Dollard Road Public Facilities Board	3rd Party User
16	Lee Creek Water Users Association	3rd Party User
17	Oak Grove Water Users Association	3rd Party User
18	Sequoyah County Water Users Association	3rd Party User
19	Roland	3rd Party User
20	Lavaca	3rd Party User
21	Charleston	3rd Party User
22	Riversouth	3rd Party User
23	James Fork Regional Water District	Emergency Contract Customer
24	LeFlore County Water District No. 2	Emergency Contract Customer
25	Mansfield	Emergency 3rd Party User
26	Hartford	Emergency 3rd Party User
27	Huntington	Emergency 3rd Party User
28	Hackett	Emergency 3rd Party User
29	Sebastian Lake Water and Sewer	Emergency 3rd Party User
30	Greenwood	Not Served
31	Pleasant View	Not Served
32	Midtown-Washburn	Not Served
33	Alma	Not Served
34	Kibler	Not Served
35	Red Hill	Not Served
36	Dyer	Not Served
37	Bonanza	Not Served
38	Mulberry	Not Served

FORT SMITH SERVICE AREA
CONTRACT CUSTOMERS SERVICE AREA
3RD PARTY USER SERVICE AREA
EMERGENCY CONTRACT CUSTOMER SERVICE AREA
EMERGENCY 3RD PARTY SERVICE AREA
NOT SERVED

FORT SMITH CITY LIMITS
COUNTY BOUNDARY
STATE BOUNDARY
26 SERVICE AREA SYMBOL NUMBER

The City of Fort Smith ARKANSAS

WATER MASTER PLAN - CITY OF FORT SMITH, ARKANSAS
FIGURE 1
SERVICE AREAS

N.T.S.	DECEMBER 2022	PROJECT NO. 19-09-ES1

HAWKINS•WEIR ENGINEERS, INC.
Fort Smith (479) 242-4685 | Van Buren (479) 474-1227 | Fayetteville (479) 455-2206 | Little Rock (501) 374-4846
www.hawkins-weir.com

The City of Fort Smith ARKANSAS

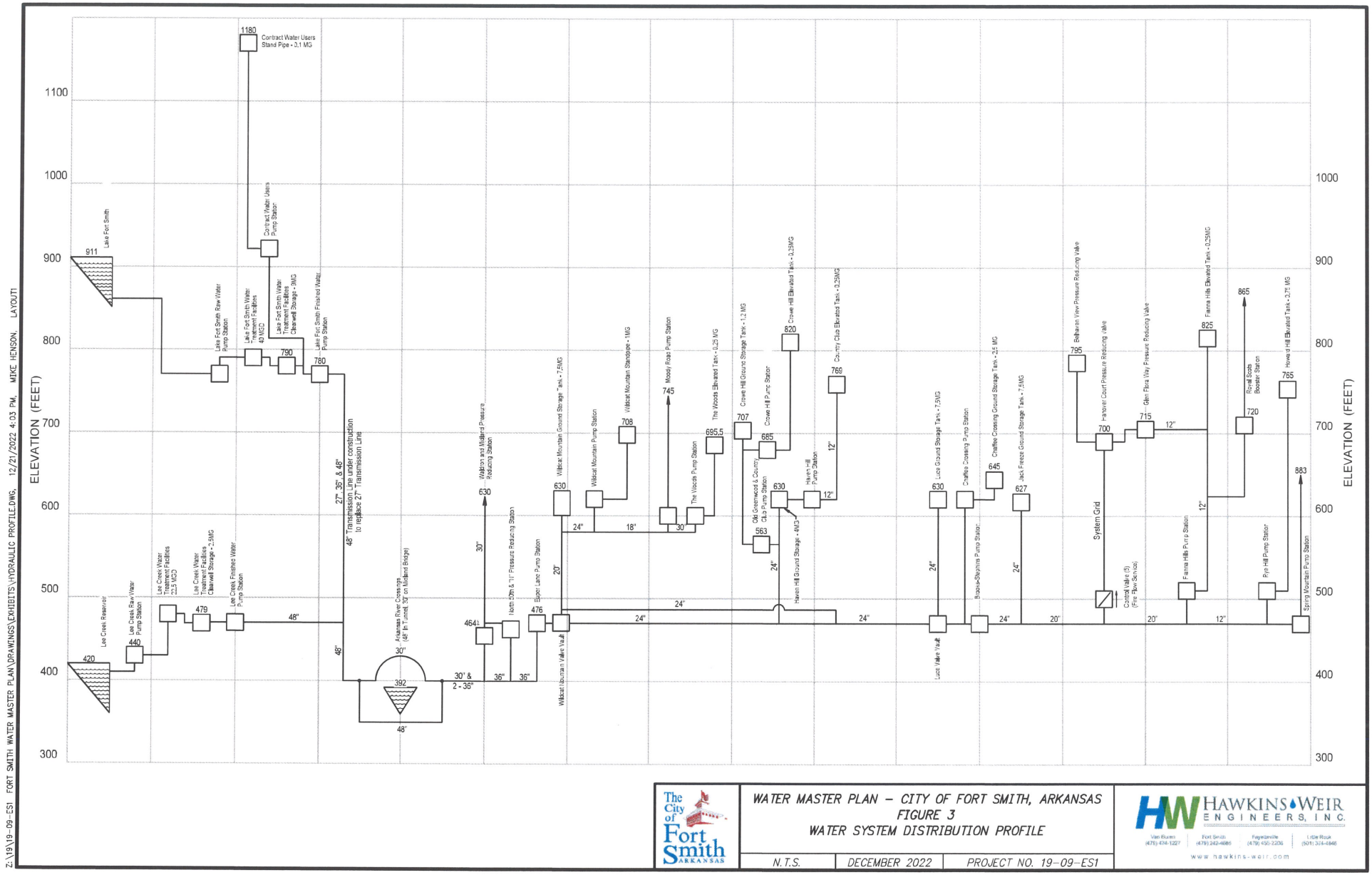
WATER MASTER PLAN - CITY OF FORT SMITH, ARKANSAS
FIGURE 2
EXISTING INFRASTRUCTURE LOCATIONS

N.T.S.	DECEMBER 2022	PROJECT NO. 19-09-ES1

HAWKINS WEIR ENGINEERS, INC.

Fort Smith (479) 242-4646 | Van Buren (479) 474-1227 | Fayetteville (479) 455-2205 | Little Rock 501) 374-4846

www.hawkins-weir.com



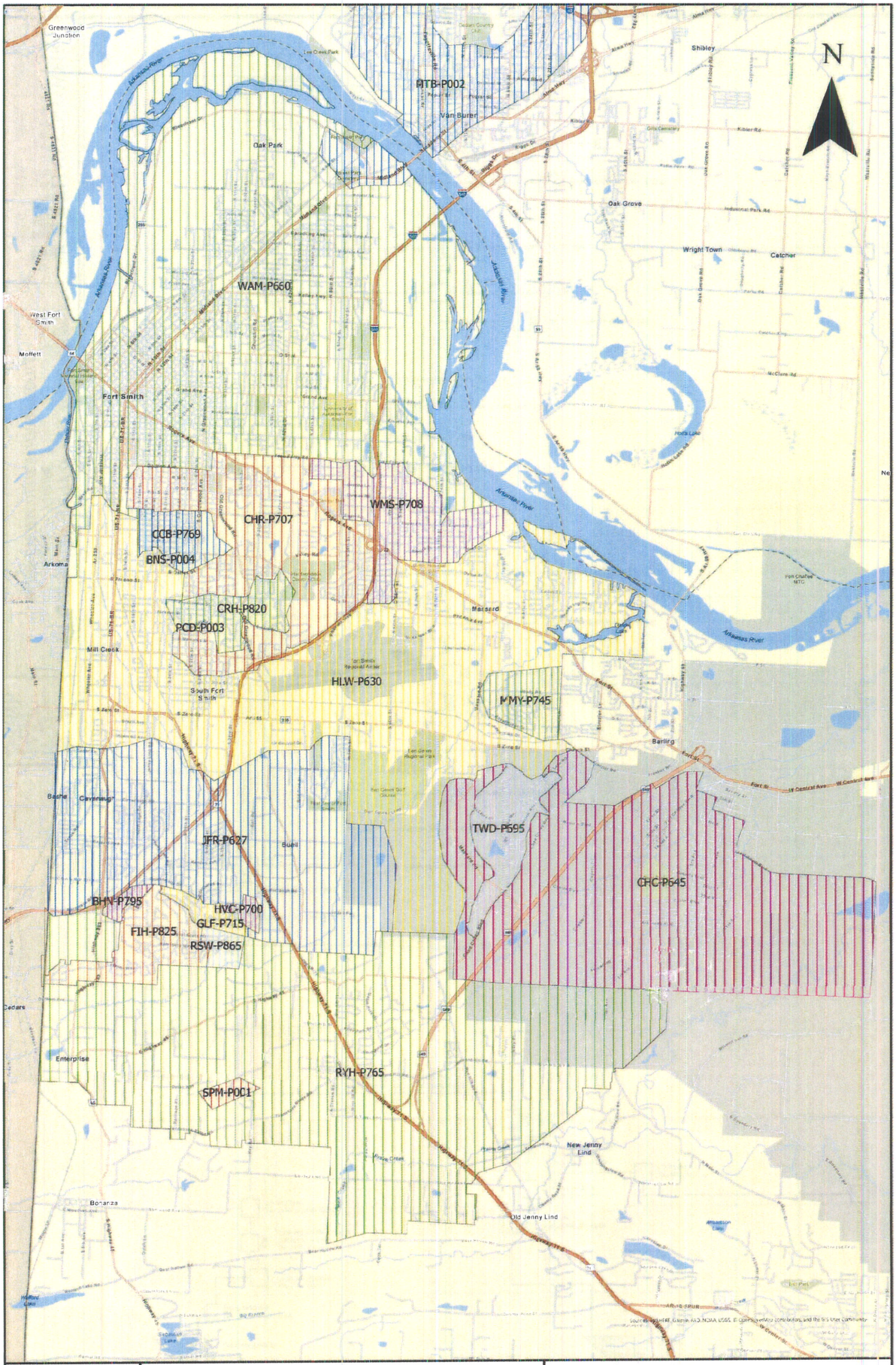
The City of Fort Smith ARKANSAS

WATER MASTER PLAN – CITY OF FORT SMITH, ARKANSAS
FIGURE 3
WATER SYSTEM DISTRIBUTION PROFILE

N.T.S.	DECEMBER 2022	PROJECT NO. 19-09-ES1

HAWKINS•WEIR ENGINEERS, INC.
Van Buren (479) 474-1227 | Fort Smith (479) 242-4686 | Fayetteville (479) 435-2236 | Little Rock (501) 324-4646
www.hawkins-weir.com

Z:\19\19-09-ES1 FORT SMITH WATER MASTER PLAN\DRAWINGS\EXHIBITS\HYDRAULIC PROFILE.DWG, 12/21/2022 4:03 PM, MIKE HENSON, LAYOUT1



The City of Fort Smith ARKANSAS

WATER MASTER PLAN - CITY OF FORT SMITH, ARKANSAS
FIGURE 4
PRESSURE ZONES

N.T.S.	DECEMBER 2022	PROJECT NO. 19-09-ES1

HAWKINS WEIR ENGINEERS, INC.
Fort Smith (479) 242-4635 | Van Buren (479) 474-1327 | Fayetteville (479) 455-2708 | Little Rock (501) 374-4848
www.hawkins-weir.com

The City of Fort Smith ARKANSAS

WATER MASTER PLAN - CITY OF FORT SMITH, ARKANSAS

FIGURE 5

2021 MDD EXISTING SYSTEM MINIMUM PRESSURE

N.T.S.	DECEMBER 2022	PROJECT NO. 19-09-ES1

HAWKINS & WEIR ENGINEERS, INC.

Fort Smith (479) 242-4885 | Van Buren (479) 474-1227 | Fayetteville (479) 455-2003 | Little Rock 501) 374-4846

www.hawkins-weir.com

The City of Fort Smith ARKANSAS

WATER MASTER PLAN - CITY OF FORT SMITH, ARKANSAS
FIGURE 6
2031 MDD EXISTING SYSTEM MINIMUM FRESSURE

N.T.S.	DECEMBER 2022	PROJECT NO. 19-09-ES1

HAWKINS & WEIR ENGINEERS, INC.

Fort Smith (479) 242-4885 | Van Buren (479) 474-1227 | Fayetteville (479) 455-2203 | Little Rock (501) 374-4846

www.hawkins-weir.com

The City of Fort Smith ARKANSAS

WATER MASTER PLAN - CITY OF FORT SMITH, ARKANSAS
FIGURE 7
2021 ADD EXISTING SYSTEM FIRE FLOW

N.T.S.	DECEMBER 2022	PROJECT NO. 19-09-ES1

HAWKINS WEIR ENGINEERS, INC.

Fort Smith (479) 242-4885 | Van Buren (479) 474-1227 | Fayetteville (479) 455-2208 | Little Rock (501) 374-4846

www.hawkins-weir.com

The City of Fort Smith ARKANSAS

WATER MASTER PLAN - CITY OF FORT SMITH, ARKANSAS

FIGURE 8

2031 ADD EXISTING SYSTEM FIRE FLOW

N.T.S.	DECEMBER 2022	PROJECT NO. 19-09-ES1

HAWKINS-WEIR ENGINEERS, INC.

Fort Smith (479) 242-4885 | Van Buren (479) 474-1227 | Fayetteville (479) 455-2208 | Little Rock (501) 374-4846

www.hawkins-weir.com

The City of Fort Smith ARKANSAS

WATER MASTER PLAN - CITY OF FORT SMITH, ARKANSAS

FIGURE 9

2031 MDD MINIMUM PRESSURE WITH PROPOSED IMPROVEMENTS

N.T.S.	DECEMBER 2022	PROJECT NO. 19-09-ES1

HAWKINS & WEIR ENGINEERS, INC.

Fort Smith (479) 242-4535 | Van Buren (479) 474-1227 | Fayetteville (479) 455-2206 | Little Rock (501) 574-4848

www.hawkins-weir.com

The City of Fort Smith ARKANSAS

WATER MASTER PLAN - CITY OF FORT SMITH, ARKANSAS FIGURE 10

2031 ADD FIRE FLOW WITH PROPOSED IMPROVEMENTS

N.T.S.	DECEMBER 2022	PROJECT NO. 19-09-ES1

HAWKINS WEIR ENGINEERS, INC.
Fort Smith (479) 242-9685 | Van Buren (479) 474-1227 | Fayetteville (479) 455-2206 | Little Rock (501) 374-4846
www.hawkins-weir.com

The City of Fort Smith ARKANSAS

WATER MASTER PLAN - CITY OF FORT SMITH, ARKANSAS
FIGURE 11
PROPOSED IMPROVEMENTS

N.T.S.	DECEMBER 2022	PROJECT NO. 19-09-ES1

HAWKINS & WEIR ENGINEERS, INC.

Fort Smith (479) 242-4635 | Van Buren (479) 474-1227 | Fayetteville (479) 455-2206 | Little Rock (501) 374-4846

www.hawkins-weir.com

Appendix A
Pump Station Information

Appendix A
Pump Station Information

Pump Station Name	Year	Pump No.	Manufacture	Model	Serial No.	Flow (gpm)	Head (ft.)	Size (in.)	Motor Size RPM	Motor Size HP
Contract Water Users Pump Station	2004	1	Gould	VC1-L	476023-1	275	540	7 WAHC	3,560	60
	2004	2	Gould	VC1-L	476023-2	275	540	7 WAHC	3,560	60
	2004	3	Gould	VC1-L	476023-3	275	540	7 WAHC	3,560	60
Lake Fort Smith WTP Finished Water Pump Station	1969	1	Fairbanks Morse	5823	K351-058983	6,475	161	12	1,185	350
	1957	2	Gould	5450	297A726	12,500	140	16	1,185	500
	1962	3	Allis-Chambers	9000	1-92639-2-1	9,500	170	18x14x23	1,170	500
Lee Creek WTP Finished Water Pump Station	2002	1	Fairbanks Morse	5823	235598	8,160	267	16	1,185	700
	2002	2	Fairbanks Morse	5823	235671-0	8,160	267	16	1,185	700
	2002	3	Fairbanks Morse	5823	235671-1	8,160	267	16	1,185	700
Brooks-Stephins Pump Station	1981	1	Allis-Chambers	150	801-37023-2-1	2,644	32	12x10x12	1,770	100
	1981	2	Allis-Chambers	150	801-37023-1-2	2,644	32	12x10x12	1,770	100
	1981	3	Allis-Chambers	150	801-37023-1-1	2,644	32	12x10x12	1,770	100
Chaffee Crossing Pump Station	2014	1	Aurora	411	13-2368827-2	2,600	120	8x10x15A	1,800	100
	2014	2	Aurora	411	13-2368827-1	2,600	120	8x10x15A	1,800	100
	2014	3	Aurora	411	12-2368827-3	2,600	120	8x10x15A	1,800	100
Crowe Hill Pump Station	2002	1	Aurora	411-BF	01-320842-2	650	153	4x5x15	1,750	40
	2002	2	Aurora	411-BF	01-320842-1	650	153	4x5x15	1,750	40
Euper Pump Station	1974	1	Peerless	5777	73-6765	6,350	130	18	1,770	250
	1974	2	Peerless	5777	73-6765	6,350	130	18	1,770	250
	1974	3	Peerless	5777	73-6765	6,000	116	18	1,670	250
Fianna Hills Pump Station	1995	1	Aurora	411-BF	94-14715-3	1,300	250	5x6x17	1,800	125
	1995	2	Aurora	411-BF	94-14715-1	1,300	250	5x6x17	1,800	125
	1995	3	Aurora	411-BF	94-14715-2	1,300	250	5x6x17	1,800	125
Haven Hill Pump Station	1981	1	Peerless	ESJ507128	G1010338	1,500	320	14MC	1,760	150
	1981	2	Peerless	-	307023	1,500	320	14MC	1,760	150
Moody Road Pump Station	1995	1	Fairbanks Morse	5822	K4C1-074863-0	800	98	4	1,760	30
	1995	2	Fairbanks Morse	5822	K4C1-074863-1	800	98	4	1,760	30
Royal Scots Booster Station	1995	1	Carver	2x2.5x7BF	1711670-1A	225	105	2.5 x 2 x 7L	3,500	10
	1995	2	Carver	2x2.5x7BF	1711670-1A	225	105	2.5 x 2 x 7L	3,500	10
Rye Hill Pump Station	1999	1	Aurora	411-BF	13-2375633	776	194	4x5x10B	3,500	60
	1999	2	Aurora	411-BF	98-06354-2	776	194	4x5x10B	3,500	60
	1999	3	Aurora	411-BF	98-06354-1	776	194	4x5x10B	3,500	60

Appendix A
Pump Station Information

Pump Station Name	Year	Pump No.	Manufacture	Model	Serial No.	Flow (gpm)	Head (ft.)	Size (in.)	Motor Size RPM	Motor Size HP
Spring Mountain Pump Station	-	1	Grundfos	CR4-80/7U	981417	22	288	4	3,450	3
	2006	2	Peerless	447113	PV2X2X8A-BF	110	160	4	2,880	7.5
	2006	3	Peerless	447114	PV2X2X8A-BF	110	160	4	2,880	7.5
The Woods Pump Station	2006	1	Peerless	4AE11G	690625B	725	94	6	1,770	25
	2006	2	Peerless	4AE11G	690625A	725	94	6	1,770	25
Wildcat Mountain Pump Station	1968	1	Fairbanks Morse	5822	K2K1032886	2,200	80	8	1,750	60
	1968	2	Fairbanks Morse	5822	K2K1032886-1	2,200	80	8	1,750	60
Old Greenwood & Country Club	2002	1	Crane Deming	5064	DC525508	3,000	119	12 x 10	1,780	125
Pump Station	2002	2	Crane Deming	5064	DC525507	3,000	119	12 x 10	1,780	125

Appendix B
Operational Setpoints Summary

Appendix B
Operational Setpoints Summary

Location	Description	Control	From	To
Waldron Road Pressure Reducing Station	16-in. PRV #1	72 psi	Transmission Line	WAM-P660 Pressure Zone
	16-in. PRV #2	72 psi	Transmission Line	WAM-P660 Pressure Zone
	16-in. PSV	90 psi		
North "N" Street Pressure Reducing Station	12-in. PRV #1	95 psi	Transmission Line	WAM-P660 Pressure Zone
	12-in. PRV #2	95 psi	Transmission Line	WAM-P660 Pressure Zone
Country Club Avenue and South Boston Street Valve Vault	6-in. PRV	32 psi	CCB-P769 Pressure Zone	BNS-P004 Pressure Zone
Haven Hill Ground Storage Tank Site	20-in. TCV	If upstream pressure below 6 psi = open	Haven Hill Ground Storage Tank Tank	WAM-P660 Pressure Zone
		If Haven Hill Tank level above 13 ft. = close	-	-
Haven Hill Ground Storage Tank Site	20-in. FCV	If Haven Hill Tank is full = close	-	-
		If Haven Hill Tank level below 16 ft. = 555 GPM	Transmission Line	Haven Hill Ground Storage Tank
		If Haven Hill Tank level below 14 ft. = 2,360 GPM		
		Flow setting adjusted via SCADA system to maintain Haven Hill, Luce, and Wildcat Tank levels		
Wildcat Mountain Flow Control Valve Vault	20-in. FCV	Flow setting adjusted via SCADA system to maintain Wildcat, Luce, and Haven Hill Tank levels	Transmission Line	Wildcat Mountain Ground Storage Tank
Luce Flow Control Valve	24-in. FCV	Flow setting adjusted via SCADA system to maintain Luce, Wildcat and Haven Hill Tank levels	Transmission Line	Luce Ground Storage Tank
Sebastion Woods Valve Vault	6-in. PRV	48 psi	CRH-P820 Pressure Zone	PCD-P003 Pressure Zone
Bellhaven View Valve Vault	6-in. PRV	78 psi	FIH-P825 Pressure Zone	BHN-P795 Pressure Zone
Glen Flora Way Valve Vault	6-in. PRV	58 psi	FIH-P825 Pressure Zone	GLF-P715 Pressure Zone
Hanover Court Valve Vault	4-in. PRV	55 psi	GLF-P715 Pressure Zone	HVC-P700 Pressure Zone
Contract Water Users Pump Station	Pump #1	If Contract Water Users Tank level below 83 ft. = on	Lake Fort Smith Water Treatment Plant	Contract Water Users Tank
		If Contract Water Users Tank is full = off		
	Pump #2	If Contract Water Users Tank level below 78 ft. = on		
		If Contract Water Users Tank level above 83 ft. = off		
	Pump #3	For redundancy only		

Appendix B
Operational Setpoints Summary

Location	Description	Control	From	To
Lake Fort Smith WTP Finished Water Pump Station	Pump #1 Pump #2 Pump #3	If discharge pressure at the Lee Creek Water Treatment Plant is 125 psi or greater and the Haven Hill, Luce, and Wildcat Mountain Ground Storage Tanks are still struggling to recover the pumps come on. For redundancy only	Lake Fort Smith Water Treatment Plant	Distribution System
Lee Creek WTP Finished Water Pump Station	Pump #1 Pump #2 Pump #3	The Lee Creek Finished Water Pump Station constantly operates to maintain a downstream pressure of 105 psi. If Haven Hill, Luce, and Wildcat Mountain Gound Storage Tanks are struggling to recover the discharge pressure is increased to 125 psi.	Lee Creek Water Treatment Plant	Distribution System
Brooks-Stephins Pump Station	Pump #1 Pump #2 Pump #3	If Jack Freeze Tank level below 42 ft. = on If Jack Freeze Tank is full = off If Jack Freeze Tank level below 40.5 ft. = on If Jack Freeze Tank is full = off For redundancy only	HLW-P630 Pressure Zone	Jack Freeze Ground Storage Tank
Chaffee Crossing Pump Station	Pump #1 Pump #2 Pump #3	If Chaffee Crossing Tank level below 23 ft. = on If Chaffee Crossing Tank is full = off If Chaffee Crossing Tank level below 22 ft. = on If Chaffee Crossing Tank level above 27 ft. = off For redundancy only	HLW-P630 Pressure Zone	Chaffee Crossing Ground Storage Tank
Crowe Hill Pump Station	Pump #1 Pump #2	If Crowe Hill Elevated Tank level below 110 ft. = on If Crowe Hill Elevated Tank is full = off If Crowe Hill Elevated Tank level below 107 ft. = on If Crowe Hill Elevated Tank level above 112 ft. = off	Crowe Hill Ground Storage Tank	Crowe Hill Elevated Tank
Euper Pump Station	Pump #1 Pump #2 Pump #3	Pumps turned on via SCADA system to maintain Haven Hill, Luce and Wildcat Ground Storage Resevoirs. The pump station is normally in standby and is only utilized as a secondary supply if the Luce and Wildcat Mountain Flow Control Valves are not maintaining tank levels.	Transmission Line	Luce and Wildcat Mountain Ground Storage Tank
Fianna Hills Pump Station	Pump #1 Pump #2 Pump #3	If Fianna Hills Tank level below 121 ft. = on If Fianna Hills Tank is full = off If Fianna Hills Tank level below 113 ft. = on If Fianna Hills Tank level above 123 ft. = off For redundancy only	JFR-P627 Pressure Zone	Fianna Hills Elevated Tank
Haven Hill Pump Station	Pump #1 Pump #2	If Country Club Elevated Tank level below 144 ft. = On If Country Club Elevated Tank is full = Off If Country Club Elevated Tank level below 137 ft. = On If Country Club Elevated Tank level above 142 ft. = Off	Haven Hill Ground Storage Tank	Country Club Elevated Tank

Appendix B
Operational Setpoints Summary

Location	Description	Control	From	To
Moody Road Pump Station	Pump #1 Pump #2	One (1) pump is always in continuous operation to maintain a downstream pressure of 130 psi. Both pumps are required to meet fire flow demands.	HLW-P630 Pressure Zone	MMY-P745 Pressure Zone
Royal Scots Booster Station	Pump #1 Pump #2	One (1) pump is always in continuous operation to maintain a downstream pressure of 90 psi.	FIH-P825 Pressure Zone	RSW-P865 Pressure Zone
Rye Hill Pump Station	Pump #1 Pump #2 Pump #3	If Howard Fill Elevated Tank level below 122 ft. = on If Howard Hill Elevated Tank is full = off If Howard Fill Elevated Tank level below 114.5 ft. = on If Howard Fill Elevated Tank level above 128.5 ft. = off For redundancy only	JFR-P627 Pressure Zone	Howard Hill Elevated Tank
Spring Mountain Pump Station	Pump #1 Pump #2 Pump #3	At least one (1) pump is always in continuous operation to maintain a downstream pressure of 95 psi.	RYH-P765 Pressure Zone	SPM-P001 Pressure Zone
The Woods Pump Station	Pump #1 Pump #2	If The Woods Elevated Tank level below 90 ft. = on If The Woods Elevated Tank is full = off If The Woods Elevated Tank level below 88 ft. = on If The Woods Elevated Tank level above 95 ft. = off	CHC-P645 Pressure Zone	The Woods Elevated Tank
Wildcat Mountain Pump Station	Pump #1 Pump #2	If Wildcat Mountain Elevated Tank level below 86 ft. = on If Wildcat Mountain Elevated Tank is full = off If Wildcat Mountain Elevated Tank level below 75 ft. = on If Wildcat Mountain Elevated Tank level above 88 ft. = off	Wildcat Mountain Ground Storage Tank	Wildcat Mountain Elevated Tank
Old Greenwood and Country Club Pump Station	Pump #1 Pump #2	If Crowe Hill Tank level below 15 ft. = on If Crowe Hill Tank is full = off For redundancy only	Transmission Line	Crowe Hill Ground Storage Tank

Appendix C
Fire Flow Deficiency Locations

Appendix C
Fire Flow Deficiency Locations

Location	Cause of Deficiency
9th Terrace	Capacity issue due to Massard WWTP demand
Near the Intersection of South "S" Street and South 12th Street	Dead end feed
Near the Intersection of South "Q" Street and South 12th Street	Dead end feed
Near the Intersection of South 14th Street and Country Club Avenue	Dead end feed
Near the Intersection of South "U" Street and State Line Road	Dead end feed
State Line Road	Dead end feed
Near the Intersection of South 5th Street and South Fresno Street	Dead end feed
Garner Lane	Dead end feed
South 27th Circle	Dead end feed
Near the Intersection of South Houston Street and Gary Street	Dead end feed
South 29th Circle	Dead end feed
St Andrews Way	Dead end feed
Tullamore Street	Dead end feed
Grace Court	Dead end feed
Mile Tree Drive	Dead end feed
South 42nd between Rogers Avenue and Free Ferry Road	Dead end feed
Near the Intersection of Elm Street and Elmwood Court	Dead end feed
Koller Street	Dead end feed
Near the Intersection of Midland Boulevard and Plum Street	Dead end feed
Near the Intersection of Yuma Street and South 30th Street	Dead end feed
10th Street between Creston Street and Belmont Street	Dead end feed
8134 Massard Road	Dead end feed
Ben Geren Regional Park	Dead end feed
Near the Intersection of Old Greenwood Road and South Zero Street	Dead end feed
Near the Intersection of South 96th Street and Moody Road	Dead end feed
Near the Intersection of Painter Drive and Moody Drive	Dead end feed
Fincastle Drive	Dead end feed
Caitlin Court	Dead end feed
Near the Intersection of Skye Road and Crosshills Road	Dead end feed
Berry Hill Road	Dead end feed
Near the Intersection of South "N" Street and South 34th Street	Dead end feed
Hunters Point Road	Dead end feed
Riverlyn Area	Low pressure
BHN-P795 Pressure Zone	Low pressure
Near the Intersection of South 32nd Street and Country Club Avenue	Low pressure (transmission line)
Near the Intersection of North Armour Street and North 50th Street	Low pressure
Warwick Circle	Small diameter water line
Oxford Circle	Small diameter water line

Appendix C
Fire Flow Deficiency Locations

Location	Cause of Deficiency
Near the Intersection of Churchill Road and North "O" Street	Small diameter water line
North 45th Circle	Small diameter water line
North 48th Circle	Small diameter water line
3434 Fischer Avenue	Small diameter water line
Near the Intersection of North 20th Street and Kelley Highway	Small diameter water line
Near the Intersection of Phoenix Avenue and State Line Road	Small diameter water line
Near the Intersection of Phoenix Avenue and South 62nd Street	Small diameter water line
Near the Intersection of McKennon Boulevard and South 74th Street	Small diameter water line
Near the Intersection of Harper Drive and Ball Road	Small diameter water line
Wirsing Avenue	Small diameter water line
Near the Intersection of North "B" Street and North 1st Street	Small diameter water line
Near the Intersection of South 21st Street and South "S" Street	Small diameter water line
South "T" Street between 22nd Street and 23rd Street	Small diameter water line
May Branch Lane	Small diameter water line
Near the Intersection of Carthage Street and South 41st Street	Small diameter water line
Apple Wood Circle	Small diameter water line
North 52nd Circle	Small diameter water line
Cedar Lane between South 6th Street and South 9th Street	Small diameter water line
Fordham Circle	Small diameter water line
Near the Intersection of Briar Cliff Avenue and South 32nd Terrace	Small diameter water line
Near the Intersection of Houston Street and Gary Street	Small diameter water line
RSW-P865 Pressure Zone	Pumps not sized to provide fire flow
RYH-P765 Pressure Zone	Outside city limits, not designed to provide fire fl
SPM-P001 Pressure Zone	Outside city limits, not designed to provide fire fl

Appendix D
48-Inch Transmission Line Integration Memorandum

HAWKINS • WEIR
ENGINEERS, INC.
Engineering Client Success

MEMORANDUM

To:	Mr. Ben Marts, P.E. City of Fort Smith Utility Department
From:	Wesley J. LeMonier, P.E.
Re:	48-Inch Transmission Line Integration
HWEI Project:	Water Master Plan – City of Fort Smith, Arkansas
HWEI Project No:	19-09-ES1
Date:	January 20, 2022

The City of Fort Smith is currently constructing a new 48-inch transmission line that will transfer water from the Lake Fort Smith Water Treatment Plant to the City of Fort Smith, replacing an existing 27-inch transmission line constructed during the 1930's. The new 48-inch transmission line will connect on the southeast side of Fort Smith, and it will primarily supply water to the southern half of the water system and specifically the areas south of Phoenix Avenue.

The proposed 48-inch transmission line will connect to the existing 36-inch transmission line on the northeast side of the City of Van Buren, near the intersection of Reeves Circle and Old Dollard Way, resulting in equivalent pressure gradients in both transmission lines at this location. From there, the 36-inch transmission line continues southwest through Van Buren, crosses the Arkansas River, and connects to the distribution system on the north side of Fort Smith. The 48-inch transmission line will extend south, cross the Arkansas River, and connect on the southeast side of Fort Smith near the intersection of Massard Road and McClure Drive.

Multiple demand scenarios were modeled for integrating the 48-inch transmission line into the Fort Smith distribution system, all of which assumed only gravity flow in the transmission line and without increasing flow or line pressure by operating the Lake Fort Smith Finished Water Pump Station. Hydraulic modeling shows that under certain average daily flow conditions, the 48-inch transmission line can supply water by gravity flow from the Lake Fort Smith Finished Water Tanks at a gradient capable of simultaneously filling the Chaffee Crossing Tank, The Woods Tank, and the Jack Freeze Tank (i.e., without operating the Lake Fort Smith Finished Water Pump Station). Under these conditions, operation of the Chaffee Crossing Pump Station, The Woods Pump Station, and the Brooks-Stephins Pump Station is not required to fill their respective storage tanks. The 48-inch transmission line can also serve the Moody Road Service Area (MMY-P745), limiting the need for the Moody Road Pump Station to run continuously. When construction of the 48-inch transmission line is completed, it is recommended that all four (4) pump stations be maintained operationally in standby mode as redundant water supply connections in the event of an interruption of flow through the 48-inch transmission line or a reduced pressure gradient in the south Fort Smith service area due to peak water demands. Exhibit 1 at the end of this memo shows all proposed improvements necessary for integrating the 48-inch transmission line into the Fort Smith distribution system.

The proposed 48-inch transmission line will be constructed primarily of cement-lined steel pipe. For design purposes, *American Water Works Association Manual M11, Steel Pipe – A Guide for Design and Installation* suggests a Hazen-Williams pipe roughness coefficient (C-factor) of 140 for pipes in good condition with smooth interior linings. However, some publications suggest a more conservative C-factor of 130 and sometimes as low as 120 for cement lined pipes. Hydraulic modeling showed that under peak day flow conditions or certain pipe roughness assumptions, the proposed 48-inch transmission line cannot provide a pressure gradient high enough under gravity flow conditions to completely fill The Woods Tank (HGL 695') or maintain pressures in the Moody Road service area. In these scenarios, it would be necessary to operate the existing Moody Road Pump Station to provide adequate residual pressures in the Moody Road service area. Similarly, it would be necessary to operate The Woods Pump Station to fill The Woods Tank if the peak day flows are sustained for an extended period. Operating the Moody Road Pump Station and The Woods Pump Station is assumed to be a more economical alternative for boosting water supply pressures in the south Fort Smith service area than utilizing the Lake Fort Smith Finished Water Pump Station to increase the hydraulic gradient at these two (2) locations.

Figure 1 illustrates the flow and pressure fluctuation in the 48-inch transmission line at its proposed connection near the intersection of Massard and McClure Road for the projected 2031 Average Day Demand (ADD) assuming a C-factor of 120. Figure 2 illustrates the flow and pressure fluctuation at the same location for the projected 2031 Maximum Day Demand (MDD) when also assuming a C-factor of 120.

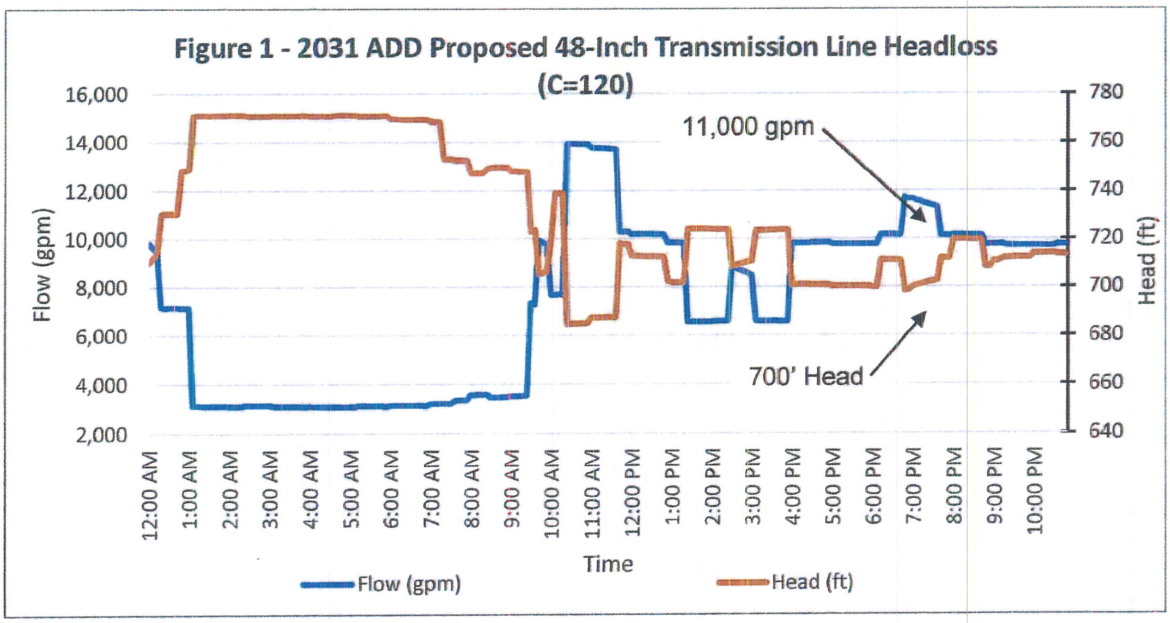
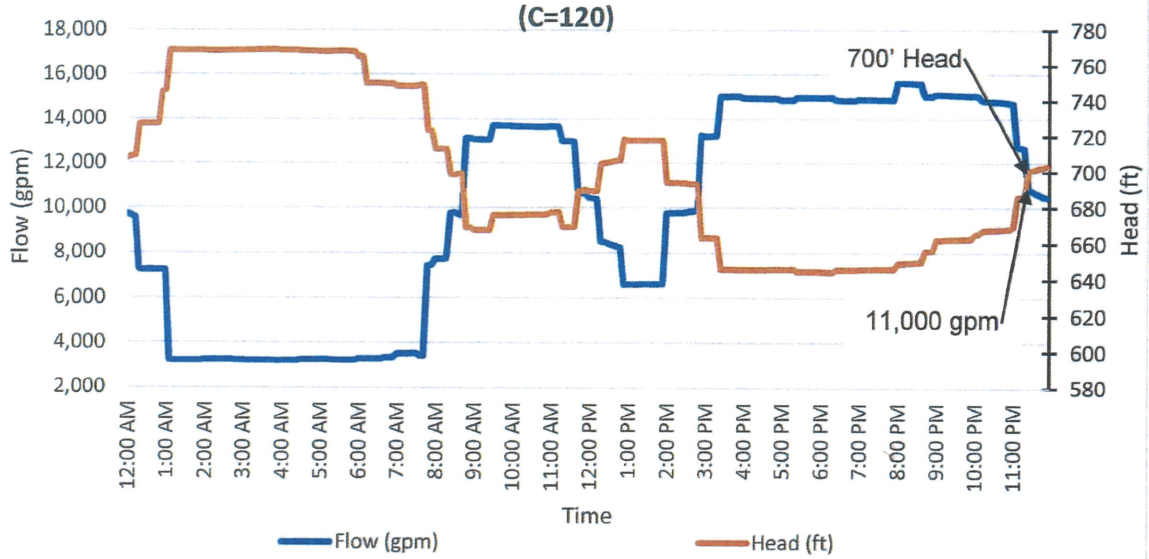


Figure 2 - 2031 MDD Proposed 48-Inch Transmission Line Headloss (C=120)



To fill The Woods Tank without utilizing The Woods Pump Station to boost pressures, the 48-inch transmission line will need to minimally maintain a hydraulic grade of 700 ft at the intersection of Massard and McClure Road. Although this minimum hydraulic gradient results in slightly reduced pressures in the Moody Road service area, it will still maintain a minimum pressure of 50 pounds-per-square-inch (psi) for all users without operating the Moody Road Pump Station.

As shown in Figure 1 and Figure 2, flows of approximately 11,000 gallons-per-minute (gpm), or 15.8 million gallons-per-day (mgd), in the proposed 48-inch transmission line result in a hydraulic gradient of approximately 700 ft at the intersection of Massard and McClure Road. Flows that exceed 11,000 gpm result in reduced hydraulic gradients due to increased frictional head losses. These lower gradients are not sufficient to fill The Woods Tank or serve the Moody Road service area without the use of their pump stations.

Cement lined ductile iron pipe typically has an expected service life approaching 100 years, and a C-factor of 140 is not unreasonable in pipe that has been in service for 20 or more years. It is assumed that cement lined welded steel pipe will have a similar in-service roughness coefficient. Figure 3 and Figure 4 illustrate the flow and pressure fluctuation on the 48-inch transmission line at its proposed connection near the intersection of Massard and McClure Road assuming an early service life C-factor of 140 for the 2031 ADD and 2031 MDD, respectively.

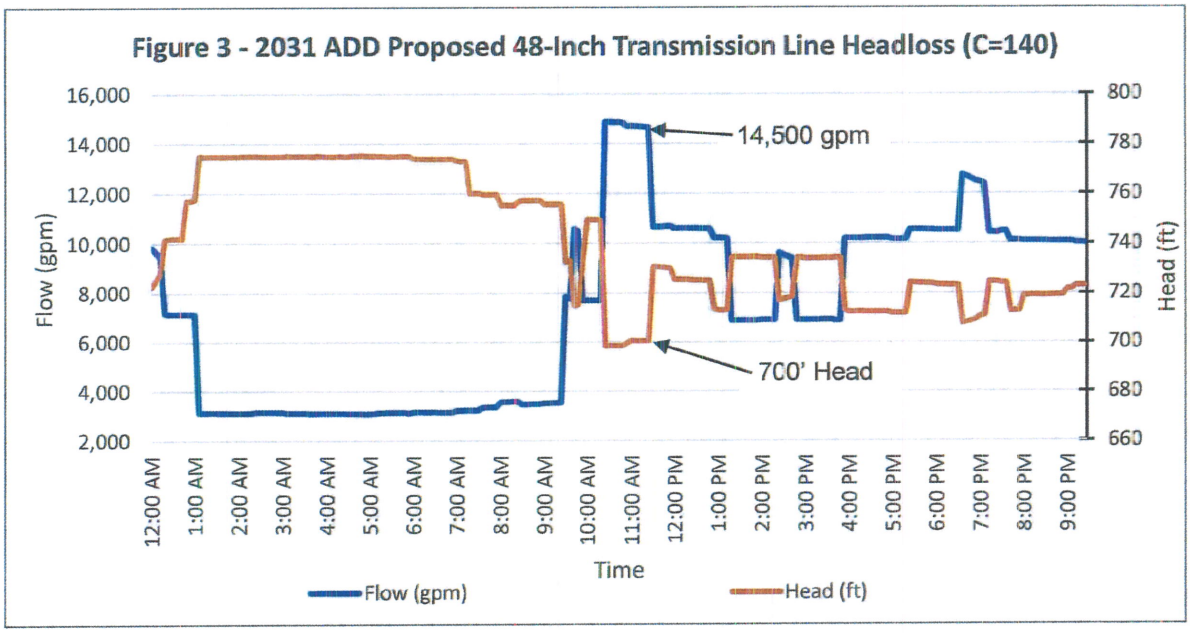


Figure 3 - 2031 ADD Proposed 48-Inch Transmission Line Headloss (C=140)
Flow (gpm)
Head (ft)
14,500 gpm
700' Head
Time
Flow (gpm)
Head (ft)

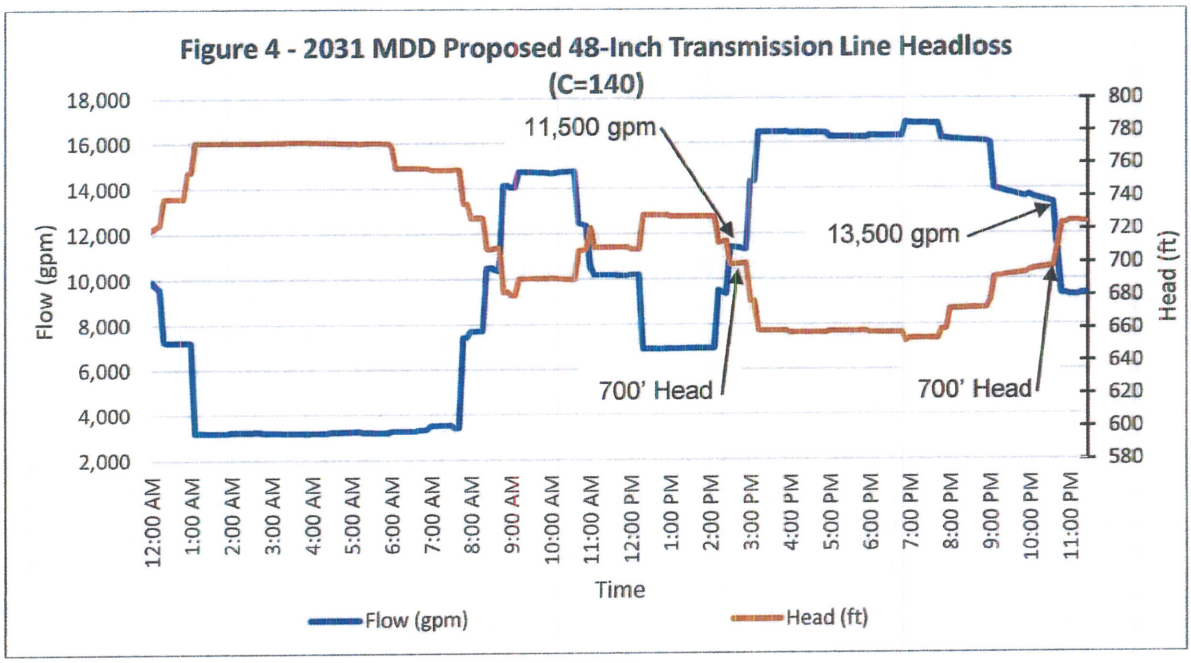


Figure 4 - 2031 MDD Proposed 48-Inch Transmission Line Headloss (C=140)
Flow (gpm)
Head (ft)
11,500 gpm
13,500 gpm
700' Head
700' Head
Time
Flow (gpm)
Head (ft)

As shown in Figure 3 and Figure 4, when assuming a C-factor of 140, flows can increase to approximately 14,500 gpm (20.9 mgd) during the 2031 ADD and range between 11,500 gpm (16.6 mgd) and 13,500 gpm (19.4 mgd) during the 2031 MDD while maintaining a hydraulic gradient of approximately 700 ft at the intersection of Massard and McClure Road. The variance in allowable flows at the 2031 MDD is due to increased demands in the North Fort Smith distribution system creating additional headloss between the Lake Fort Smith Water Treatment Plant and the point of convergence of the existing 36-inch transmission line and the proposed 48-inch transmission line. With a C-factor of 140, flows in the 48-inch transmission line would have to exceed 16.6 mgd before it would become necessary to operate the Moody Road Pump Station, and the system would likely require sustained flows in excess of 19.4 mgd before The Woods Pump Station would need to be utilized. In all modeled scenarios, the Moody Road Pump Station and The Woods Pump Station were sufficient for meeting peak day demands assuming that the Lake Fort Smith Finished Water Pump Station is not utilized.

Exhibit 2 shows all the existing pressure zones in the Fort Smith water transmission and distribution system. When completed, the proposed 48-inch transmission line will serve the following Pressure Zones and Contract Customers: CHC-P645, TWD-P695, JFR-P627, FIH-P825, RSW-P865, GLF-P715, HVC-P700, BHN-P795, RYH-P765, SPM-P001, MMY-P745, Central City, Fort Chaffee Maneuver Training Center, and the Franklin-Sebastian Public Water Authority. These Pressure Zones and Contract Users have a cumulative 2031 MDD of approximately 14.6 mgd, which is less than the expected maximum gravity flow in the 48-inch transmission line of 15.8 mgd and 16.6 mgd when assuming roughness C-factors of 120 and 140, respectively.

Integration of the new 48-inch transmission line into the Fort Smith distribution system will require the following improvements (see Exhibit 1):

- **Painter Lane 12-inch Water Line and East Point Drive PRV (serving MMY-P745):** Installation of 4,800 LF of 12-inch water line to serve the MMY-P745 Pressure Zone currently served by the Moody Road Pump Station. The proposed 12-inch water line will connect to the 48-inch transmission line near the intersection of Frontier Road and Wells Lake Road and will connect to the MMY-P745 Pressure Zone at the intersection of Painter Lane and Moody Road. Higher system pressures caused by lower elevations along East Pointe Drive (in the southeast corner of the MMY-P745 Pressure Zone) will require the installation of a 3-inch PRV on the existing water line along Painter Lane between Shadow Branch Lane and East Pointe Drive. Connection of this pressure zone to the 48-inch transmission line will allow the Moody Road Pump Station to be placed in standby.

- **Highway 255 12-inch Water Line and PRV (serving HLW-P630):** Installation of a 12-inch pressure reducing valve (PRV) at the intersection of South Zero Street and Painter Lane to serve the HLW-P630 Pressure Zone via a 12-inch water line installed as part of the Highway 255 Utility Relocations Project (19-10-C1). This project will connect to the proposed 12-inch water line serving the MMY-P745 Pressure Zone, and the resulting connection to the 48-inch transmission line will serve as a secondary feed to the HLW-P630 Pressure Zone.

- **The Woods Tank PRV/FCV (serving TWD-P695):** Installation of a 12-inch pressure reducing/flow control valve (PRV/FCV) on the existing 12-inch water line between Massard Road and The Woods Tank to serve the TWD-P695 Pressure Zone. This will allow The Woods Pump Station to be placed in standby.

- **Chaffee Crossing/Massard Road PRV/FCV (serving HLW-P630):** Installation of a 30-inch PRV/FCV at the Chaffee Crossing Pump Station to serve the HLW-P630 Pressure Zone. This valve will be used to supplement flow to the Wildcat Mountain Ground Storage Tank via the Massard Road 30-inch transmission line. This will also serve as a secondary feed to the HLW-P630 Pressure Zone (specifically for the Wildcat Mountain Tank), with primary service being supplied from the north. To address potential water age issues in a short section of the Massard Road Transmission Line between Huntington Way and the Chaffee Crossing Pump Station, the flow control feature would open the valve to flush water back into the north system and remain open based on a timer.

- **Chaffee Crossing/Geren Road PRV/FCV (serving JFR-P627):** Installation of a 24-inch (PRV/FCV) at the Chaffee Crossing Pump Station to serve the JFR-P627 Pressure Zone via the Geren Road 24-inch Transmission Line. This valve will allow the Brooks-Stephins Pump Station to be placed in standby. In the event the proposed 48-inch transmission line were out of service, the system would revert to its current operation with the Brooks-Stephins Pump Station supplying water to the Jack Freeze Ground Storage Tank (JFR-P627 Pressure Zone). Without the Brooks-Stephins Pump Station, the HLW-P630 Pressure Zone will not be able to fill the Jack Freeze Tank, resulting in reduced pressures in the JFR-P627 Pressure Zone.

- **Brooks-Stephins/Highway 45 FCV (serving HLW-P630):** Installation of a 20-inch flow control valve (FCV) immediately north of the Brooks-Stephins Pump Station to serve the HLW-P630 Pressure Zone. This valve will be used to supplement flow to the Luce Tank via the 20-inch transmission line between the Luce Tank and the Brooks-Stephins Pump Station. This will serve as a secondary feed to the HLW-P630 Pressure Zone (specifically for the Luce Tank) if primary supply from the north side of Fort Smith is interrupted. To address potential water age issues in the short section of water line north of the Brooks-Stephens pump station, the flow control feature would open the valve to flush water back into the north system and remain open based on a timer.

- **Chaffee Crossing Tank PRV/FCV (serving CHC-P645):** Installation of pressure reducing and flow control improvements to an existing control valve near the Chaffee Crossing Tank to serve the CHC-P645 Pressure Zone, and to allow the Chaffee Crossing Pump Station to be placed in standby. In the event the proposed 48-inch transmission line were out of service, the system could revert to its current operation with the HLW-P630 Pressure Zone serving the CHC-P645 Pressure Zone. Without the Chaffee Crossing Pump Station, the HLW-P630 Pressure Zone will not be able to fill the Chaffee Crossing Ground Storage Tank and will result in reduced pressures in the CHC-P645 Pressure Zone.

- **Reatta 8-inch Water Line (primary feed from CHC-P645):** Installation of approximately 800 LF of 8-inch water line to serve the Reatta Subdivision, located just southwest of the Chaffee Crossing Pump Station, from the CHC-P645 Pressure Zone. The water line will connect to the Chaffee Crossing Tank fill line and will extend north approximately 800 feet to connect to an existing 8-inch water line along the west side of Massard Road and provide loop feed to the Reatta Subdivision.

- **Reatta 8-inch Water Line (secondary feed from JFR-P627):** Installation of 300 LF of 8-inch water line and a check valve to provide a secondary feed to the Reatta Subdivision from the JFR-P627 Pressure Zone. The water line will connect to the Geren Road 24-inch transmission line just north of the Chaffee Crossing Pump Station and will connect to the existing 8-inch water line that serves the Reatta Subdivision at the intersection of Massard Road and Cisterna Way. The current feed to the Reatta Subdivision will need to be closed to avoid serving the area with transmission line pressure.

- **Planters Road 24-inch Water Line and PRV/FCV:** Installation of approximately two (2) miles of 24-inch water line to extend along Planters Road from Massard Road to Highway 45 and a PRV/FCV to be located near the intersection of Planters Road and Highway 45. These improvements will provide water service to a presently unserved/underserved industrial area along Planters Road, and the PRV/FCV will allow higher pressures along Planters Road than are available from the JFR-P627 pressure plane. In addition, this line will provide a redundant feed into the JFR-P627 Pressure Zone along Highway 45. This valve will need to include flow control features that are identical to the Chaffee Crossing/Geren Road 24-inch PRV/FCV.

By adding flow control features to the proposed pressure reducing valves that provide service to larger service areas, the water system operators will be able to restrict flow to maintain adequate transmission line pressure, similar to how the existing Luce and Wildcat Flow Control Valves are operated. Hydraulic water modeling results indicate that gravity flow from the Lake Fort Smith Finished Water Tanks can be delivered to the south Fort Smith service area at a sufficient gradient to fill the Chaffee Crossing Tank, The Woods Tank, the Jack Freeze Tank, and serve the Moody Road area (MMY-P745) without assistance from their respective pump stations.

Representatives of Cla-Val have confirmed that the recommended pressure reduction and flow control features can be provided with the following list of valve models. Cla-Val has several add-ons including pressures transmitters, electronic actuated pilot valves, orifice plates, etc. They also have a flow meter package if the valve needs to measure flow rates.

- Cla-Val Model 90-01 for the PRVs on East Pointe Drive and Highway 255
- Cla-Val Model 92-07 for the PRV/FCV at The Woods tank
- Cla-Val Model 92-22 for the PRV/FCVs at Chaffee Crossing/Massard Road, Chaffee Crossing/Geren Road, and Planters Road
- Cla-Val Model 136-41 for the Brooks-Stephins FCV
- Cla-Val Model 93-01 for the PRV/FCV at the Chaffee Crossing Tank

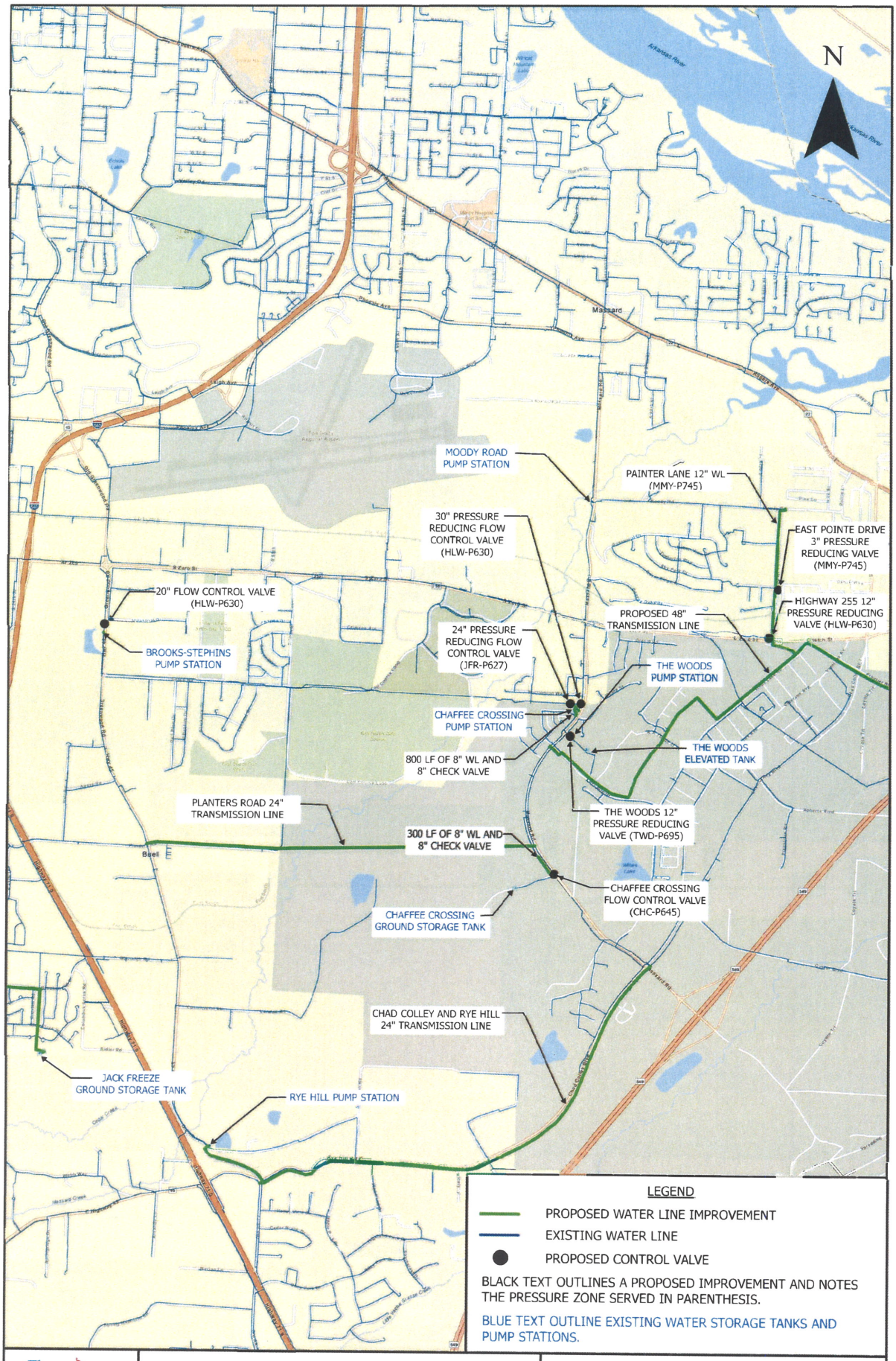
As demands in south Fort Smith continue to increase beyond the projected 2031 MDD and C-factors in the proposed 48-inch transmission line decrease with age, it is likely that gravity flow alone through the transmission line will not provide sufficient gradient to serve the Moody Road area or to fill The Woods Tank. At that point, operation of The Woods Pump Station and the Moody Road Pump Station could be required to provide supplemental system flows and pressures.

It should be noted that none of the modeled scenarios described above require operation of the Lake Fort Smith Finished Water Pump Station. However, use of the Lake Fort Smith Finished Water Pump Station may result in the transmission line providing pressures nearing 170 psi, which may require the installation of a pressure reducing valve along with the 12-inch water line connection on Painter Lane for the Moody Road service area (MMY-P745). It is also recommended that all proposed piping, valves and appurtenances receiving transmission line pressures should have a minimum working pressure rating of 200 psi.

END OF MEMO

WJL/mcw

Attachment: Exhibit 1 – 48-inch Transmission Line Integration Proposed Improvements
Exhibit 2 – Fort Smith Water System Pressure Zones



The City of Fort Smith ARKANSAS

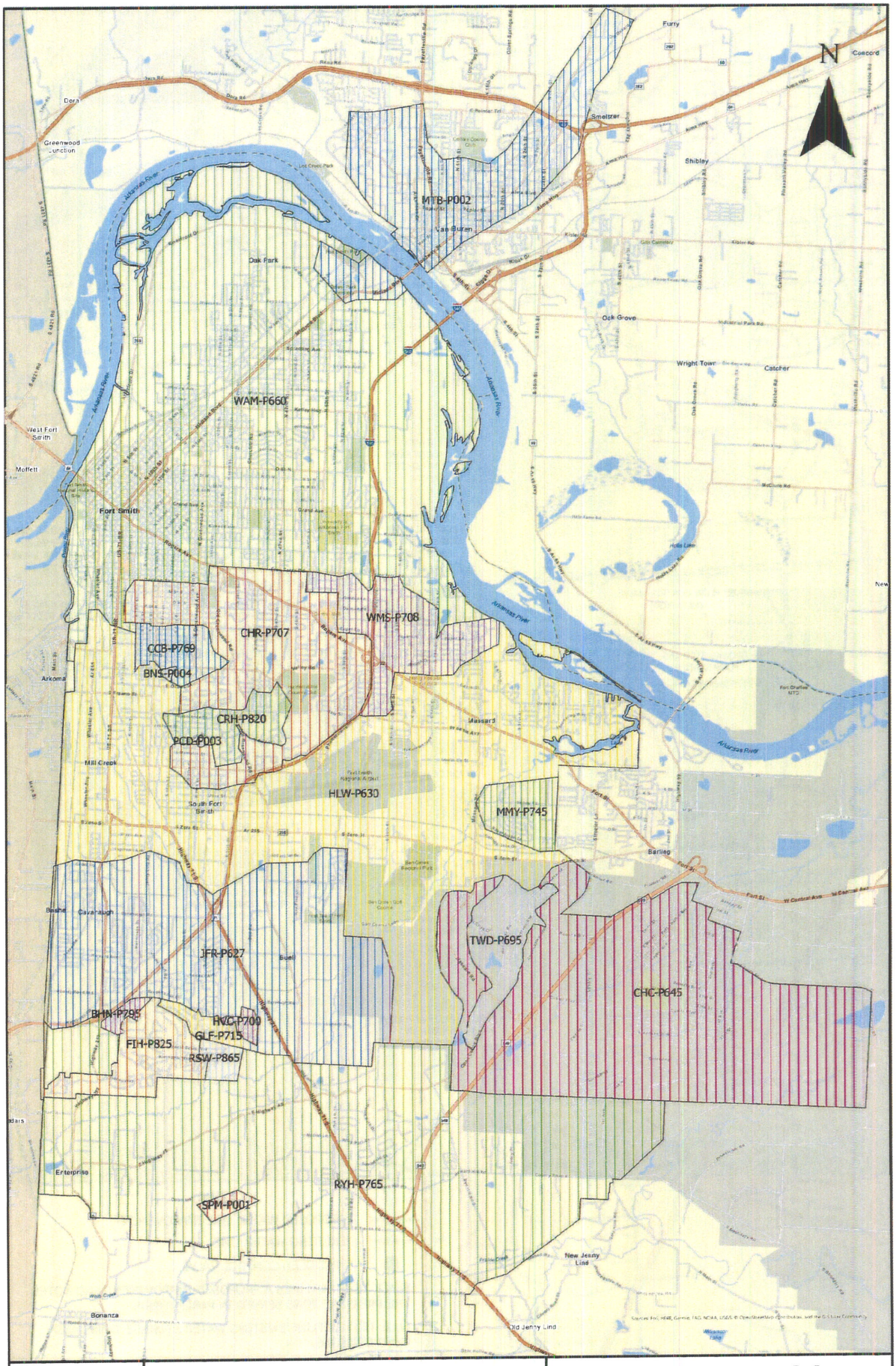
EXHIBIT 1
48-INCH TRANSMISSION LINE INTEGRATION
PROPOSED IMPROVEMENTS
CITY OF FORT SMITH, ARKANSAS

N.T.S.	JANUARY 2022	PROJECT NO. 19-09-ES1

HAWKINS & WEIR ENGINEERS, INC.

Fort Smith (479) 242-4685 | Van Buren (479) 474-1227 | Fayetteville (479) 455-2206 | Little Rock (501) 374-4846

www.hawkins-weir.com



The City of Fort Smith ARKANSAS

EXHIBIT 2
FORT SMITH WATER SYSTEM PRESSURE ZONES
CITY OF FORT SMITH, ARKANSAS

N.T.S.	JANUARY 2022	PROJECT NO. 19-09-ES1

HAWKINS & WEIR ENGINEERS, INC.

Fort Smith (479) 242-4685 | Van Buren (479) 474-1227 | Fayetteville (479) 455-2905 | Little Rock (501) 374-4846

www.hawkins-weir.com

Bibliography

Burns & McDonnell. 1993. "Water System Master Plan Volume I - Service Area, Projected Demand, and Evaluation of Existing Facilities."

Burns & McDonnell. 1993. "Water System Master Plan Volume II - Water Distribution Analysis."

Burns & McDonnell. 1995. "Water System Master Plan Volume III - Evaluation of Future Water Supply Alternatives."

Burns & McDonnell. 1997. "Water System Master Plan Volume IV - Study of FIve Water Source Alternatives."

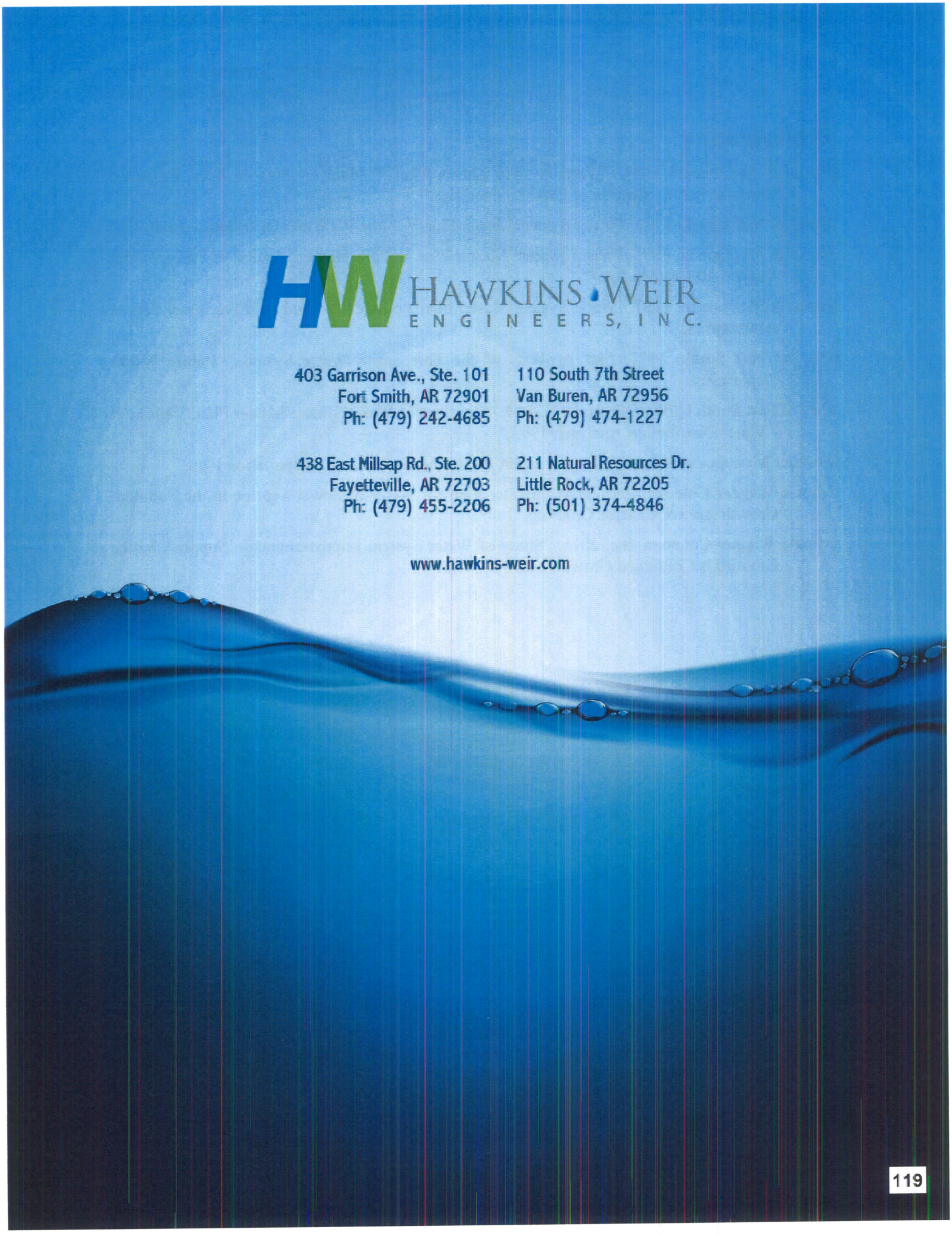
City of Fort Smith. 1977. "An Analysis of the Fort Smith Water System." Public Works Department.

City of Fort Smith Utility Department. 2004. "Supplement Water System Master Plan, Volume II - Water Distribution Analysis, 1993."

Frontier Metropolitan Planning Organization. 2016. "Metropolitan Transportation Plan."

Mickle Wagner Coleman, Inc. 2010. "Master Plan for Water & Sewer Service in the Southern Growth Area & Chaffee Crossing."

Mickle Wagner Coleman, Inc. 2011. "Study of Water System Improvements to Supply Chaffee Crossing's Continued Growth."


HW
HAWKINS • WEIR
ENGINEERS, INC.
403 Garrison Ave., Ste. 101
Fort Smith, AR 72901
Ph: (479) 242-4685
110 South 7th Street
Van Buren, AR 72956
Ph: (479) 474-1227
438 East Millsap Rd., Ste. 200
Fayetteville, AR 72703
Ph: (479) 455-2206
211 Natural Resources Dr.
Little Rock, AR 72205
Ph: (501) 374-4846
www.hawkins-weir.com

City of Fort Smith Engineering

MEMORANDUM

TO: Jeff Dingman, Acting City Administrator

CC: Maggie Rice, Deputy City Administrator

FROM: Todd Mittge, Director of Engineering

DATE: January 29, 2026

SUBJECT: CIP for Water Systems Maintenance and Improvements For 2026 and 2027-2035

SUMMARY

Presented is the Prioritized Capital Improvement Plan (CIP) for Water for the years 2026 to 2035.This plan was originally presented at the December 2, 2025 meeting and was defeated pending further discussion.

On the first sheet, the 2025 Beginning Balance is a total of contingency (money not obligated) and outstanding commitments/contracts. The outstanding commitments are shown as Estimated Expenditures in years 2025-2027. Funding required for the 2026 Water Project (CIP) is estimated to be $53,771,534. Available resources for these projects total $25,072,226 leaving a negative balance at the end of 2026 of $-233,181.00. Funding for projects listed for years 2027 through 2035 has not been identified. The layout of the Water CIP has changed from previous years. For example, Item 4.1 Distribution System is related to water distributions main improvements, and Item 6.3 ARDOT Relocation Projects is related to water line relocations necessitated by highway improvements being performed by ARDOT. This change in layout was made to group projects of similar types together to allow easier comparison of the project types. In addition, a column was added to show the recommended priority for projects identified for the 2026 CIP. One area of concern are reimbursements on ARDOT projects. Portions of these projects are reimbursable to the City, however reimbursements are only available for City infrastructure that was in existence prior to ARDOT's acquisition of rights-of-way in the construction corridor. City infrastructure located in ARDOT rights-of-way installed after ARDOT acquired the right-of-way must be moved at the City's expense. Staff continues to explore grant opportunities as a potential funding mechanism for projects. The Proposed Water CIP totals $382,631,600 for the years 2027 to 2035. Possible funding sources for unfunded projects could include rate increases along the lines previously presented to the Board, impact fees, and incorporation of a surcharge mechanism for water volume usage above usage thresholds as established by wholesale contract language.

ATTACHMENTS

1. 2-10-26 Item ID 2421 Updated CIP Engineering-Utilities.pdf

CITY OF FORT SMITH

Engineering Department's Ten-Year Capital Improvement Program for Water (2026-2035)

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Beginning Balance	**27,497,910**	**25,072,226**	**-233,181**	**-71,544,181**	**-106,019,181**	**-139,419,181**	**-194,369,181**	**-245,572,181**	**-292,782,181**	**-320,522,181**	**-345,682,181**
Expected Revenue	0	0	0	0	0	0	0	0	0	0	0
Congressionally Directed Funding*	0	15,000,000	0	0	0	0	0	0	0	0	0
ArDot Remaining Reimbursements *	0	13,466,127	0	2,000,000	0	0	0	0	0	0	0
Total Funds Available	**27,497,910**	**53,538,353**	**-233,181**	**-69,544,181**	**-106,019,181**	**-139,419,181**	**-194,369,181**	**-245,572,181**	**-292,782,181**	**-320,522,181**	**-345,682,181**
Watershed Management											
1.1 Stream Bank Restoration	0	300,000	0	775,000	0	750,000	350,000	350,000	350,000	350,000	350,000
1.2 Watershed Land Purchase	0	0	0	0	0	0	0	0	0	0	0
Watershed Management System Subtotal	**0**	**300,000**	**0**	**775,000**	**0**	**750,000**	**350,000**	**350,000**	**350,000**	**350,000**	**350,000**
Treatment											
2.1 Water Treatment Capacity Improvements	0	0	0	3,000,000	3,000,000	20,000,000	20,000,000	20,000,000	0	0	6,600,000
2.2 Water Treatment Maintenance	0	0	4,000,000	0	0	0	0	0	0	0	0
2.3 Water Treatment Miscellaneous	0	0	200,000	500,000	1,500,000	0	0	0	0	0	0
Treatment Subtotal	**0**	**0**	**4,200,000**	**3,500,000**	**4,500,000**	**20,000,000**	**20,000,000**	**20,000,000**	**0**	**0**	**6,600,000**
Transmission System											
3.1 Transmission Lines (New Construction)	700,555	22,519,712	29,000,000	21,700,000	21,000,000	18,650,000	17,500,000	14,930,000	17,420,000	14,420,000	14,852,600
3.2 Transmission Lines (Maintenance and Rehabilitation	32,922	3,000,000	0	0	0	0	0	280,000	3,720,000	0	0
Operations Subtotal	**733,477**	**25,519,712**	**29,000,000**	**21,700,000**	**21,000,000**	**18,650,000**	**17,500,000**	**15,210,000**	**21,140,000**	**14,420,000**	**14,852,600**
Distribution System											
4.1 Distribution System	0	5,000,000	2,500,000	2,500,000	1,250,000	5,000,000	2,000,000	2,500,000	2,750,000	5,780,000	5,780,000
Operations Subtotal	**0**	**5,000,000**	**2,500,000**	**2,500,000**	**1,250,000**	**5,000,000**	**2,000,000**	**2,500,000**	**2,750,000**	**5,780,000**	**5,780,000**
Pumping & Storage Facilities											
5.1 Pump & Pressure Reduction Stations	0	500,000	2,500,000	6,500,000	5,150,000	6,500,000	5,000,000	2,500,000	2,500,000	2,860,000	6,100,000
5.2 Elevated and Ground Storage Tanks	0	2,750,000	3,000,000	500,000	500,000	3,050,000	5,353,000	5,650,000	0	750,000	500,000
Pumping & Storage Facilities	**0**	**3,250,000**	**5,500,000**	**7,000,000**	**5,650,000**	**9,550,000**	**10,353,000**	**8,150,000**	**2,500,000**	**3,610,000**	**6,600,000**
Operations and Program Support											
6.1 Operations	0	0	0	0	0	0	0	0	0	0	0
6.2 Regulatory Compliance	0	0	0	0	0	0	0	0	0	0	0
6.3 ArDOT Utility Relocation Projects	1,692,207	18,701,822	29,111,000	0	0	0	0	0	0	0	0
6.4 Contingency & Economic Development	0	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
6.5 Roadway Reimbursed Projects	0	0	0	0	0	0	0	0	0	0	0
Operations and Program Support	**1,692,207**	**19,701,822**	**30,111,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**
Total Expenditures	**2,425,684**	**53,771,534**	**71,311,000**	**36,475,000**	**33,400,000**	**54,950,000**	**51,203,000**	**47,210,000**	**27,740,000**	**25,160,000**	**35,182,600**
Ending Balance	**25,072,226**	**-233,181**	**-71,544,181**	**-106,019,181**	**-139,419,181**	**-194,369,181**	**-245,572,181**	**-292,782,181**	**-320,522,181**	**-345,682,181**	**-380,864,781**

Notes.
ArDOT Reimbursements *Conditional upon approval and processing by State and completion of projects

Congressionally Directed Funding* Conditonal upon receipt of funds and can only be used for Project Numbers 19-33 and 21-14(2a)

Rev. 2/6/2026

Watershed Management

Description	Project #	Estimated 2025 Expenditure	Estimated 2026 Expenditure	Estimated 2027 Expenditure	Estimated 2028 Expenditure	Estimated 2029 Expenditure	Estimated 2030 Expenditure	Estimated 2031 Expenditure	Estimated 2032 Expenditure	Estimated 2033 Expenditure	Estimated 2034 Expenditure	Estimated 2035 Expenditure
1.1 Stream Bank Restoration												
Mt. Fork/Brown Stream Bank Restoration - Lee Creek Watershed	-	$ -	$ 300,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Frog Bayou Stream Bank Restoration - Frog Bayou Watershed (Upper Pense Property)	-	$ -	$ -	$ -	$ 300,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Source Water Protection/Watershed Management	-	$ -	$ -	$ -	$ 475,000	$ -	$ 750,000	$ 350,000	$ 350,000	$ 350,000	$ 350,000	$ 350,000
	Subtotal	**$ -**	**$ 300,000**	**$ -**	**$ 775,000**	**$ -**	**$ 750,000**	**$ 350,000**	**$ 350,000**	**$ 350,000**	**$ 350,000**	**$ 350,000**
1.2 Watershed Land Purchase												
Forestry Service Land Trade	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Subtotal	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

Year	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Total (Watershed Management)	**$ -**	**$ 300,000**	**$ -**	**$ 775,000**	**$ -**	**$ 750,000**	**$ 350,000**	**$ 350,000**	**$ 350,000**	**$ 350,000**	**$ 350,000**

Treatment

Description	Project #	Estimated 2025 Expenditure	Estimated 2026 Expenditure	Estimated 2027 Expenditure	Estimated 2028 Expenditure	Estimated 2029 Expenditure	Estimated 2030 Expenditure	Estimated 2031 Expenditure	Estimated 2032 Expenditure	Estimated 2033 Expenditure	Estimated 2034 Expenditure	Estimated 2035 Expenditure
2.1 Water Treatment Capacity Improvements												
LFS Treatment Expansion (40 to 62 MGD)	-	$ -	$ -	$ -	$ 3,000,000	$ 3,000,000	$ 20,000,000	$ 20,000,000	$ 20,000,000	$ -	$ -	$ -
LFS Treatment Expansion (62 to 70 MGD) & East Filter Replacement	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,600,000
	Subtotal	**$ -**	**$ -**	**$ -**	**$ 3,000,000**	**$ 3,000,000**	**$ 20,000,000**	**$ 20,000,000**	**$ 20,000,000**	**$ -**	**$ -**	**$ 6,600,000**
2.2 Water Treatment Maintenance												
Back-up Power Generator for the Lake Fort Smith Water Treatment Plant (Replacement)	-	$ -	$ -	$ 4,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Subtotal	**$ -**	**$ -**	**$ 4,000,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
2.3 Water Treatment Miscellaneous												
Lee Creek Water Filling Station	-	$ -	$ -	$ 200,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Lake Fort Smith & Lee Creek Plant Optimization Study	-	$ -	$ -	$ -	$ 500,000	$ 1,500,000	$ -	$ -	$ -	$ -	$ -	$ -
	Subtotal	**$ -**	**$ -**	**$ 200,000**	**$ 500,000**	**$ 1,500,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

Year	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Total (Treatment)	**$ -**	**$ -**	**$ 4,200,000**	**$ 3,500,000**	**$ 4,500,000**	**$ 20,000,000**	**$ 20,000,000**	**$ 20,000,000**	**$ -**	**$ -**	**$ 6,600,000**

Transmission System

Description	Project #	Estimated 2025 Expenditure	Estimated 2026 Expenditure	2026 Priority	Estimated 2027 Expenditure	Estimated 2028 Expenditure	Estimated 2029 Expenditure	Estimated 2030 Expenditure	Estimated 2031 Expenditure	Estimated 2032 Expenditure	Estimated 2033 Expenditure	Estimated 2034 Expenditure	Estimated 2035 Expenditure
3.1 Transmission Lines (New Construction)													
LFS 48 inch Transmission Line Phase 2 (Environmental Assessment & Design)	16-16	$ 155,436	$ -	N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
LFS 48 inch Transmission Line Phase 2a Construction	19-33	$ -	$ 21,000,000	3	$ 4,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
LFS 48 inch Transmission Line Phase 2b Construction	20-03	$ -	$ -	N/A	$ 25,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
LFS 48 inch Transmission Line Phase 3 (Design)	18-20	$ 320,675	$ -	N/A	$ -	$ 300,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
LFS 48 inch Transmission Line Phase 3 (Environmental Assessment)	18-20	$ -	$ -	N/A	$ -	$ 400,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
LFS 48 inch Transmission Line Phase 3 (Construction)	18-20	$ -	$ -	N/A	$ -	$ 21,000,000	$ 21,000,000	$ -	$ -	$ -	$ -	$ -	$ -
LFS 48 inch Transmission Line Phase 4 (Design)	18-21	$ 124,443	$ -	N/A	$ -	$ -	$ -	$ 750,000	$ -	$ -	$ -	$ -	$ -
LFS 48 inch Transmission Line Phase 4b (River Tunnel Environmental Assessment)	18-21	$ -	$ -	N/A	$ -	$ -	$ -	$ 400,000	$ -	$ -	$ -	$ -	$ -
LFS 48 inch Transmission Line Phase 4b (River Tunnel Construction)	18-21	$ -	$ -	N/A	$ -	$ -	$ -	$ 17,500,000	$ 17,500,000	$ -	$ -	$ -	$ -
LFS 48 inch Transmission Line Phase 5 (Design)	19-03	$ 100,000	$ 1,519,712	N/A	$ -	$ -	$ -	$ -	$ -	$ 150,000	$ -	$ -	$ -
LFS 48 inch Transmission Line Phase 5 (Environmental Assessment)	19-03	$ -	$ -	N/A	$ -	$ -	$ -	$ -	$ -	$ 400,000	$ -	$ -	$ -
LFS 48 inch Transmission Line Phase 5 (Construction)	19-03	$ -	$ -	N/A	$ -	$ -	$ -	$ -	$ -	$ 14,000,000	$ 14,000,000	$ 14,420,000	$ 14,852,600
Chaffee Crossing Pressure Reducing Station (Design and Construction)	-	$ -	$ -	N/A	$ -	$ -	$ -	$ -	$ -	$ 380,000	$ 3,420,000	$ -	$ -
	Subtotal	**$ 700,555**	**$ 22,519,712**		**$ 29,000,000**	**$ 21,700,000**	**$ 21,000,000**	**$ 18,650,000**	**$ 17,500,000**	**$ 14,930,000**	**$ 17,420,000**	**$ 14,420,000**	**$ 14,852,600**
3.2 Transmission Lines (Maintenance and Rehabilitation)													
Midland Bridge Transmission Line Repair	23-21	$ 32,922	$ 1,000,000	2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Rehabilitation of I-540 Water Line Crossing (Euper Lane)	23-22	$ -	$ 2,000,000	1									
Chaffee Crossing, Relocate 5100 ft. of 18 in Line (Design and Construction)	-	$ -	$ -	N/A	$ -	$ -	$ -	$ -	$ -	$ 280,000	$ 3,720,000	$ -	$ -
	Subtotal	**$ 32,922**	**$ 3,000,000**		**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 280,000**	**$ 3,720,000**	**$ -**	**$ -**

Year	2025	2026		2027	2028	2029	2030	2031	2032	2033	2034	2035
Total (Transmission System)	**$ 733,477**	**$ 25,519,712**		**$ 29,000,000**	**$ 21,700,000**	**$ 21,000,000**	**$ 18,650,000**	**$ 17,500,000**	**$ 15,210,000**	**$ 21,140,000**	**$ 14,420,000**	**$ 14,852,600**

Distribution System

Description	Project #	Estimated 2025 Expenditure	Estimated 2026 Expenditure	2026 Priority	Estimated 2027 Expenditure	Estimated 2028 Expenditure	Estimated 2029 Expenditure	Estimated 2030 Expenditure	Estimated 2031 Expenditure	Estimated 2032 Expenditure	Estimated 2033 Expenditure	Estimated 2034 Expenditure	Estimated 2035 Expenditure
4.1 Distribution System													
Race Track Road Water Line Improvements	24-15	$ -	$ 2,000,000	N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Neighborhood Water System Improvements/Water Line Replacement - 1	21-13	$ -	$ -	N/A	$ -	$ -	$ -	$ 5,000,000	$ 2,000,000	$ -	$ -	$ -	$ -
Neighborhood Water System Improvements/Water Line Replacement - 2a	21-14	$ -	$ 3,000,000	4	$ 2,500,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Neighborhood Water System Improvements/Water Line Replacement - 2b	21-14	$ -	$ -	N/A	$ -	$ 2,500,000	$ 1,250,000	$ -	$ -	$ -	$ -	$ -	$ -
Neighborhood Water System Improvements/Water Line Replacement	-	$ -	$ -	N/A	$ -	$ -	$ -	$ -	$ -	$ 2,500,000	$ 2,500,000	$ 2,500,000	$ 2,500,000
Replace 12 in Line Tennessee Road (Design and Construction)	-	$ -	$ -	N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ 250,000	$ 3,280,000	$ 3,280,000
	Subtotal	**$ -**	**$ 5,000,000**		**$ 2,500,000**	**$ 2,500,000**	**$ 1,250,000**	**$ 5,000,000**	**$ 2,000,000**	**$ 2,500,000**	**$ 2,750,000**	**$ 5,780,000**	**$ 5,780,000**

Year	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Total (Distribution System)	**$ -**	**$ 5,000,000**	**$ 2,500,000**	**$ 2,500,000**	**$ 1,250,000**	**$ 5,000,000**	**$ 2,000,000**	**$ 2,500,000**	**$ 2,750,000**	**$ 5,780,000**	**$ 5,780,000**

Pumping & Storage Facilities

Description	Project #	Estimated 2025 Expenditure	Estimated 2026 Expenditure	2026 Priority	Estimated 2027 Expenditure	Estimated 2028 Expenditure	Estimated 2029 Expenditure	Estimated 2030 Expenditure	Estimated 2031 Expenditure	Estimated 2032 Expenditure	Estimated 2033 Expenditure	Estimated 2034 Expenditure	Estimated 2035 Expenditure
5.1 Pump & Pressure Reduction Stations													
Downtown Pressure Reducing Station (Design and Construction)	-	$ -	$ -	N/A	$ -	$ -	$ 150,000	$ 1,500,000	$ -	$ -	$ -		
Replace Stateline Road Booster Pump Station	-	$ -	$ -	N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 360,000	$ 3,600,000
Equipment Replacement	-	$ -	$ 500,000	N/A	$ 2,500,000	$ 6,500,000	$ 5,000,000	$ 5,000,000	$ 5,000,000	$ 2,500,000	$ 2,500,000	$ 2,500,000	$ 2,500,000
	Subtotal	**$ -**	**$ 500,000**		**$ 2,500,000**	**$ 6,500,000**	**$ 5,150,000**	**$ 6,500,000**	**$ 5,000,000**	**$ 2,500,000**	**$ 2,500,000**	**$ 2,860,000**	**$ 6,100,000**
5.2 Elevated and Ground Storage Tanks													
Howard Hill Ground Storage and Transmission Line Ext (Design and Const)	-	$ -	$ -	N/A	$ -	$ -	$ -	$ 800,000	$ 5,353,000	$ 5,350,000	$ -	$ -	$ -
Water Tank Painting (Luce Reservoir)	24-03	$ -	$ 2,000,000	5	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Tank Painting (Country Club Tank)	-	$ -	$ 500,000	6	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Tank Painting (Pense Tank)	-	$ -	$ 250,000	7	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Tank Painting (Howard Hill Elv Tank)	-	$ -	$ -	N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 750,000	$ -
Water Tank Painting (Wildcat Mountain-Standpipe)	-	$ -	$ -	N/A	$ 750,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Tank Painting (Wildcat Mountain-Reservoir)	-	$ -	$ -	N/A	$ 2,250,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Tank Painting (Crowe Hill Tank)	-	$ -	$ -	N/A	$ -	$ 500,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Tank Cleaning (Crowe Hill, Chaffee Crossing & Jack Freeze Concrete Reservoirs)	-	$ -	$ -	N/A	$ -	$ -	$ -	$ -	$ -	$ 300,000	$ -	$ -	$ -
Water Tank Painting (Fianna Hills Elv Tank)	-	$ -	$ -	N/A	$ -	$ -	$ 500,000	$ -	$ -	$ -	$ -	$ -	$ -
Water Tank Rubber Liner Rehab (Haven Hill Reservoir)	-	$ -	$ -	N/A	$ -	$ -	$ -	$ 2,250,000	$ -	$ -	$ -	$ -	$ -
Water Tank Painting (Woods Elv Tank)	-	$ -	$ -	N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 500,000
	Subtotal	**$ -**	**$ 2,750,000**		**$ 3,000,000**	**$ 500,000**	**$ 500,000**	**$ 3,050,000**	**$ 5,353,000**	**$ 5,650,000**	**$ -**	**$ 750,000**	**$ 500,000**

Year	2025	2026		2027	2028	2029	2030	2031	2032	2033	2034	2035
Total (Pumping & Storage Facilities)	**$ -**	**$ 3,250,000**		**$ 5,500,000**	**$ 7,000,000**	**$ 5,650,000**	**$ 9,550,000**	**$ 10,353,000**	**$ 8,150,000**	**$ 2,500,000**	**$ 3,610,000**	**$ 6,600,000**

Operations and Program Support

Description	Project #	Estimated 2025 Expenditure	Estimated 2026 Expenditure	2026 Priority	Estimated 2027 Expenditure	Estimated 2028 Expenditure	Estimated 2029 Expenditure	Estimated 2030 Expenditure	Estimated 2031 Expenditure	Estimated 2032 Expenditure	Estimated 2033 Expenditure	Estimated 2034 Expenditure	Estimated 2035 Expenditure
6.1 Operations													
Indirect and Operating Costs	-	$ -	$ -	N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project Management Services	-	$ -	$ -	N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Seb. Co. Clerk, Scanning CIP projects	-	$ -	$ -	N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Subtotal	**$ -**	**$ -**		**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
6.2 Regulatory Compliance													
Lead & Copper Rule Inventory Compliance	-	$ -	$ -	N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Subtotal	**$ -**	**$ -**		**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
6.3 ArDOT Utility Relocation Projects													
ARDoT I-540 Distribution Line Project (Reimbursable)	23-10	$ 100,000	$ 371,595	N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
ARDoT Hwy 255 Water Line Project (Reimbursable)	23-06	$ 133,407	$ -	N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Hwy 45 Utility Water Line Relocation (85% Reimbursable)	19-12	$ 514,000	$ 6,264,950	N/A	$ 2,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Transmission Line @ Gun Club Interchange	24-12	$ 600,000	$ 954,277	N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Rogers Avenue Utility Relocations (Waldron to 70th) (Reimbursable)	23-11	$ 344,800	$ -	N/A	$ 21,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Replace 24 in Line N. M St to Towson and S. I St. (Design and Construction)(Reimbursable)	20-20	$ -	$ 5,000,000	8	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Towson Relocation Overlay Project (Reimbursable)	20-20	$ -	$ 6,111,000	9	$ 6,111,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Subtotal	**$ 1,692,207**	**$ 18,701,822**		**$ 29,111,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
6.4 Contingency & Economic Development													
Contengency & Economic Development	-	$ -	$ 1,000,000		$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000
	Subtotal	**$ -**	**$ 1,000,000**		**$ 1,000,000**	**$ 1,000,000**	**$ 1,000,000**	**$ 1,000,000**	**$ 1,000,000**	**$ 1,000,000**	**$ 1,000,000**	**$ 1,000,000**	**$ 1,000,000**
6.5 Roadway Reimbursed Projects													
Roadway Reimbured projects	-	$ -	$ -		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Subtotal	**$ -**	**$ -**		**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

Year	2025	2026		2027	2028	2029	2030	2031	2032	2033	2034	2035
Total (Operations and Program Support)	$ 1,692,207.00	$ 19,701,822.00		$ 30,111,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00