City Manager's Office
215 E. McKinney St., Denton, TX 76201 • (940) 349-8307

MEMORANDUM

DATE: September 05, 2025
TO: The Honorable Mayor Hudspeth and Council Members
FROM: Sara Hensley, City Manager
SUBJECT: Friday Staff Report

Upcoming Meetings

1. Development Code Review Committee on **Monday, September 8, 2025,** at **3:00 p.m.** at the Development Service Center.
2. CANCELLED - Board of Ethics on **Monday, September 8, 2025,** at **5:30 p.m.** in the City Council Work Session Room.
3. Historic Landmark Commission on **Monday, September 8, 2025,** at **5:30 p.m.** at the Development Service Center.
4. Library Board on **Monday, September 8, 2025,** at **5:30 p.m.** at the North Branch Library.
5. Parks, Recreation and Beautification Board on **Monday, September 8, 2025,** at **6:00 p.m.** in the Civic Center Community Room.
6. Work Session of the City Council on **Tuesday, September 9, 2025,** at **2:00 p.m.** in the City Council Work Session Room followed by a Special Called Meeting at **6:30 p.m.** in the Council Chambers.
7. Animal Shelter Advisory Committee on **Wednesday, September 10, 2025,** at **10:00 a.m.** at the Linda McNatt Animal Care & Adoption Center.
8. Economic Development Partnership Board on **Wednesday, September 10, 2025,** at **11:00 a.m.** at the Development Service Center.
9. CANCELLED - Airport Advisory Board on **Wednesday, September 10, 2025,** at **3:00 p.m.** in the Airport Terminal Meeting Room.
10. Planning and Zoning Commission on **Wednesday, September 10, 2025,** at **6:00 p.m.** in the City Council Work Session Room & Council Chambers.
11. CANCELLED - Health and Building Standards Commission on **Thursday, September 11, 2025,** at **3:00 p.m.** at the Development Service Center.
12. Community Services Advisory Committee on **Friday, September 12, 2025,** at **12:00 p.m.** at the Development Service Center.

Please check the City of Denton website for final meeting days and times as information is subject to change after the Friday Report is published.

Public Meetings & Agendas | Denton, TX (civicplus.com)

General Information & Status Updates

A. Monthly Mobility Report - Innovative Transportation Solutions (ITS) provides a monthly report that includes an overview of Texas Department of Transportation (TxDOT) regional projects. See Attachment A for the ITS Monthly Mobility Report for review. Staff contact: Seth Garcia, Capital Projects

B. Mayor's Pet Spotlight – Meet Mango, a delightful and energetic puppy who's been waiting for his forever home at the shelter. His previous foster family shared that he's a wonderful companion, getting along well with kids, cats, and other dogs. Plus, Mango is already potty trained, and crate trained, making him a fantastic addition to any family. With his playful spirit, he's sure to bring joy and fun to your life! Please contact Denton Animal Services by phone at (940) 349-7594, or via email at Animal.Services@cityofdenton.com. Staff contact: Bailey Coleson, Animal Services.

C. Downtown Safety Meeting – On Tuesday, Aug. 26, City staff hosted a downtown safety meeting with local property and business owners at the Development Services Center. The meeting drew 28 attendees and covered a range of topics, including the City's efforts to support persons experiencing homelessness and a status update of the Downtown Ambassador Program. Additionally, the Denton Police Department provided information on their Downtown patrol team, including coverage areas and hours of operation, and covered resources for business and property owners. Staff contact: Kristen Pulido, Economic Development.

Responses to Council Member Requests for Information

A. Thistle Hill Estates Construction – On Aug. 29, Council Member Holland asked staff to address an ongoing concern with large, heavy construction vehicles entering the Thistle Hill Estates neighborhood. Staff found that a poorly placed sign was inadvertently diverting construction traffic into the neighborhood, rather than away. Staff relocated the "No Construction Traffic" sign into the entrance of the Thistle Hill Estate neighborhood on Andrew Avenue, thereby directing construction traffic away from the neighborhood. Staff contact: Wesley M. McBride, Capital Projects

B. Left turn from Bolivar to University Drive – On Aug. 9, Council Member Holland inquired about eliminating the left turn option from Bolivar Street to University Drive. The City will provide traffic counts and a safety evaluation to TXDOT for consideration. There are several similar median openings along the US 380/University Drive corridor, and businesses might be adversely impacted by the closures, which will be evaluated. Data collection and safety analysis are expected within 3 to 4 months. Findings will be presented to TxDOT for a determination and approval. Staff contact: Chandra Muruganandham, Transportation Services

Attachments

Attachment A: August Monthly Mobility Report

City of Denton Transportation/Mobility Project Status Report

Prepared by ITS

August 2025

PROJECTS

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- I-35 North ..... page 3
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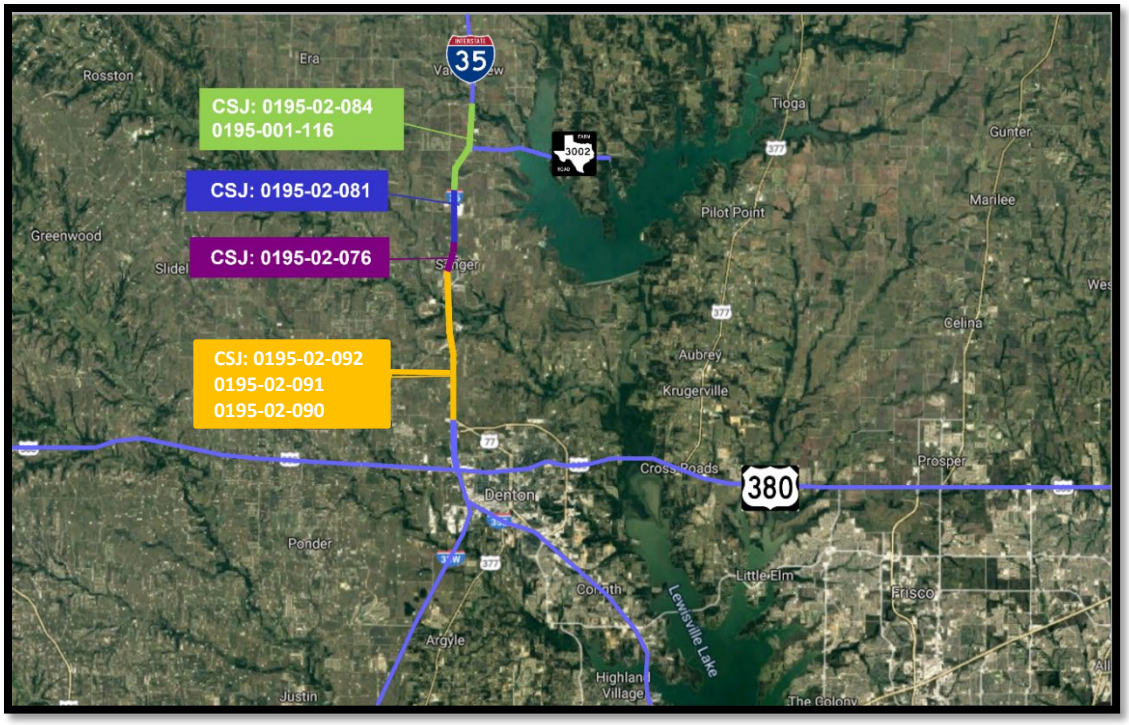
PROJECT SUMMARY

PROJECT	LET DATE	CONTRACTOR/ ENGINEER	CONSTRUCTION COST
I-35 North	Various	Stantec	$936,000,747
I-35/35E/35W Merge	04-2024	Sema Construction	$588,780,841
I-35E/Mayhill	06-2025	Zachary Construction	$123,539,232
I-35W Frontage Roads Middle	09-2028	WSP	$213,024,000
Loop 288 West Frontage Roads	09-2028	CP&Y	$227,423,354
Loop 288 East-US 380 Connector	*	Westwood	$1,262,000,000
Bonnie Brae Segment 7	*	Westwood	*
FM 1515	*	LTRA	$69,484,709
FM 1173	*	Halff	$125,852,145
Outer Loop	*	LJA	$1,547,212,128
		TOTAL	**$5,093,317,156**

I-35 North

CSJ:	**0195-02-074**; 0195-02-076; **0195-02-081**; 0195-01-116; 0195-02-084; 0195-02-092; 0195-02-091; 0195-02-090	**Schematic Approval:**	January 31, 2019
Limits:	From US 77 to FM 3002 (Cooke County line)	**Environmental Approval:**	October 7, 2019
Length:	12.4 miles		
Description:	Reconstruct and widen 4- to 6-lane rural freeway with ramp modifications and reconstruct 4- to 4/6-lane frontage roads	**ROW Acquisition Complete:**	July 2023
Est. Construction Cost:	$936,000,747 -092: $187,409,484 -091: $158,653,846 -090: $187,500,000 -081: $128,704,134 -116: $110,895,970 -084: $116,266,771	**Utility Relocations Complete:**	-092: August 2026 -091: August 2026 -090: August 2026 -081: June 2025 -116: October 2025 -084: October 2025
Construction Funding:	$801,507,230 CAT 4: $220,966,122 CAT 11: $2,574,631 CAT 12: $577,966,477	**100% Plans:**	-092: March 2026 -091: December 2026 -090: June 2027 -081: June 2025 -116: August 2025 -084: August 2025
Firm:	Stantec	**Ready to Let Date:**	-092: August 2026 -091: December 2026 -090: June 2027 -081: June 2025 -116: October 2025 -084: October 2025
TxDOT PM:	Dawit Abraham	**Let Date:**	-092: November 2026 -091: November 2027 -090: November 2028 -081: August 7, 2025 -116: December 2029 -084: December 2029



Current Activity:

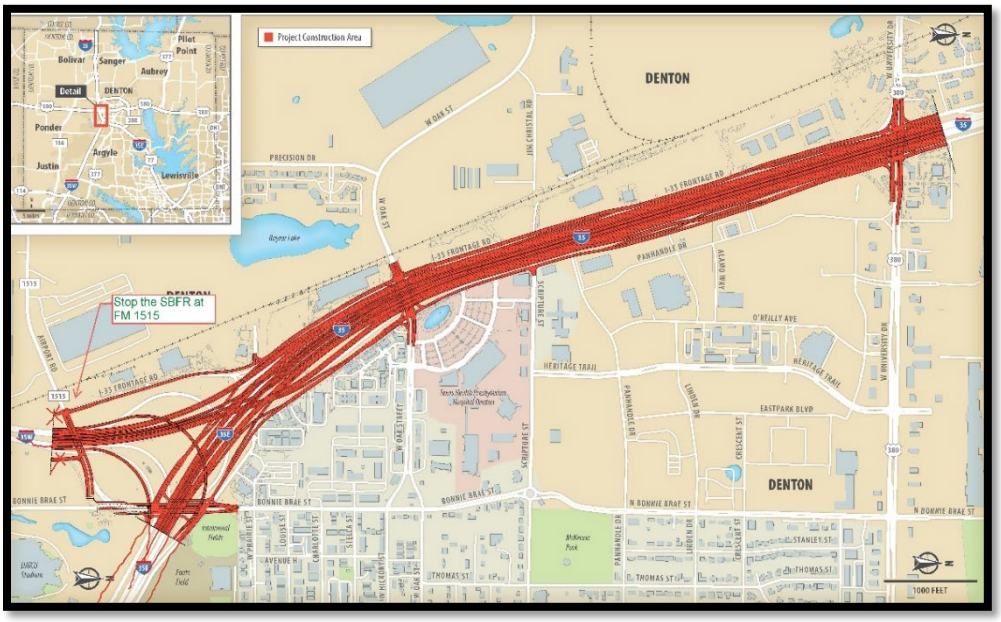
- **PS&E:** Work on the 100% PS&E plan set for the -074 CSJ is underway with updates to 2024 TxDOT Specifications. TxDOT has split -074 CSJ into three separate CSJs for letting.
- Work on the 100% PS&E plan set for -084 CSJ is underway with updates to the 2024 TxDOT Specifications; some scope being shifted from the -081 CSJ.
- **Utilities:** The status of utilities in conflict is listed below by CSJ/segment.
  IH-35 from US 77 to South of FM 455; CSJ: 0195-02-074
  - Utilities that are clear of construction: AT&T, Atmos Distribution, Brazos Electric, City of Denton, Frontier, Nortex, OneOK, Sanger Electric, and Sanger Water/Wastewater.
  - Utilities that are currently relocating: CenturyLink/Brightspeed, Bolivar WSC, CoServ Electric, MCI/Verizon, and UTRWD.
  - Utilities that are pending relocations: Altice, Lumen/Level 3, and Zayo.
  - Utilities that are critical path: None

  IH-35 from North of FM 455 to View Road; CSJ: 0195-02-081
  - Utilities that are clear of construction: AT&T, Bolivar WSC, Brightspeed/CenturyLink, Lumen/Level 3, Nortex, Sanger Electric, and Sanger Water/Wastewater.
  - Utilities that are currently relocating: MCI/Verizon and Zayo.
  - Utilities that are pending relocations: None.
  - Utilities that are critical path: MCI/Verizon. Identified that Lumen/Level 3 and Zayo may not be clear; pending confirmation.

  IH-35 from View Road to Cooke County Line (FM 3002); CSJ: 0195-02-084
  - Utilities that are clear of construction: AT&T, Bolivar WSC, CoServ Electric, Lumen/Level 3, Nortex, and Sanger Electric.
  - Utilities that are currently relocating: None.
  - Utilities that are pending relocations: MCI/Verizon, Oncor, and Zayo.
  - Utilities that are critical path: Oncor Electric needs to be clear prior to Zayo.
- **Construction:** The 0195-02-081 project let for construction on August 7, 2025. The apparent low bidder is Indus Road & Bridge, Inc. with a low bid of $128,704.133.71. There are 37 months of barricades.

I-35/35E/35W Merge

CSJ:	0195-03-099 (N Texas Blvd to I-35E/W) 0195-03-090 (I-35E/W to US 380) **0195-03-087** (US 380 to US 77)	**Schematic Approval:**	-090: August 2011 -087: January 31, 2019
Limits:	From North Texas Blvd to US 77 north of Denton	**Environmental Approval:**	-090: June 2017 -087: October 7, 2019
Length:	5.073 miles	**ROW Acquisition Completed:**	May 2022
Description:	Reconstruct interchange and existing frontage roads; reconstruct and widen to 6/8-lane rural freeway with ramp modifications	**Utility Relocations Complete:**	May 2025
Est. Construction Cost:	$588,780,841	**City of Denton Utility Relocations Completed:**	December 2024
Construction Funding:	$588,780,841 CAT 2: $65,978,054 CAT 3: $1,452,495 CAT 4: $75,042,004 CAT 11: $106,973,305 CAT 12 (Strategic Priority): $219,334,983 CAT 12 (Texas Clear Lanes): $120,000,000	**100% Plans:**	January 2024
Firm & Key Contact:	AECOM (-090); Stantec (-087)	**Let Date:**	April 4, 2024
TxDOT PM:	John Rich	**Construction Completion:**	November 2029



Current Activity:

- **Utilities:** Identified conflicts are being coordinated in the field for adjustment.
- **Construction:** The project let for construction on April 4, 2024. The project was awarded to Sema Construction with a low bid of $588,780,840.70, at 18% above engineer's estimate. There are 1,356 working days and 56 months of barricades. See attached TxDOT construction report.

TxDOT Monthly Project Report
Date of report: August 6, 2025
Report prepared by: Jonathan Rich

Project: **0195-03-087, ETC**
Control: **0195-03-087, ETCA**
Highway: **IH 35**
Limits: IH35E at North Texas Blvd to North of US 77 on IH35
Contractor: **Sema**

TxDOT Project Manager: Jonathan Rich — Phone: (945) 290-0731
Contractor's Project Manager: Shea Hurley — Phone: (720) 215-8056

Date Work Began: January 13, 2025
Anticipated Completion Date: November 2029

Current Activities:

Current activities: Southbound frontage road and northbound frontage road: drainage being installed. Temporary detours on new I-35E to I-35W direct connector; northbound frontage Road at Bonnie Brae – traffic switch on August 13, 2025. Permanent pavement on I-35E northbound frontage road at N. Texas and I-35W. ITS, illumination, and signage; pole removal throughout project; transfer to temporary ITS ongoing on northbound frontage road; temporary traffic signal at Bonnie Brae ongoing. Building 6 retaining walls throughout project; placing panels and earthwork; building 4 bridges throughout project; placing columns and caps.

Narrative description of last month's activities: Completion of culvert by UNT stadium; southbound frontage road/northbound frontage road US 380 to North Texas – drainage lines. Temporary detours – ongoing activities; direct connector; northbound frontage road at Bonnie Brae – hot mix asphalt and prep; northbound frontage road detour – hot mix asphalt and prep; southbound frontage road south of US 380 – hot mix asphalt. Permanent pavement on northbound N. Texas/Bonnie Brae off-ramp – flex base. Permanent road and earthwork for – southbound frontage road tie-in at US 288; southbound frontage road N. Texas to Bonnie Brae; I-35W Loop to Airport Road; and northbound frontage road N. Texas to Bonnie Brae off-ramp. ITS, illumination, and signage; pole removal throughout project; ITS northbound frontage road transfer to temporary ITS; temporary traffic signal at Bonnie Brae. Building 5 retaining walls throughout project; placing panels and earthwork; building 4 bridges throughout project; placing columns and caps.

Narrative description of activities planned for next month: Drainage lines begin installed at I-35W, southbound frontage road/northbound frontage road at Scripture-US 380-Loop 288, and southbound frontage road Airport to Prairie/Oak. Temporary detours: ongoing activities throughout project. Striping and traffic switches pending. Permanent pavement on northbound frontage road N Texas-Bonnie Brae off-ramp – flex base. Permanent road at southbound frontage road tie-in at US 388, southbound frontage road N Texas to Bonnie Brae; I-35W Loop to Airport Road – hot mix asphalt; and northbound frontage road N Texas to Bonnie Brae off-ramp – hot mix asphalt. ITS, illumination, and signage; pole removal throughout project; ITS northbound frontage road; transfer to temporary ITS; place overhead temporary signs throughout project. Continue building 6 retaining walls throughout project; placing panels and earthwork; continue building 4 bridges throughout project; placing columns and caps.

Traffic issues: Nightly lane closures. Temporary one-lane frontage road throughout project in multiple locations. Several night traffic switches expected in August/September.

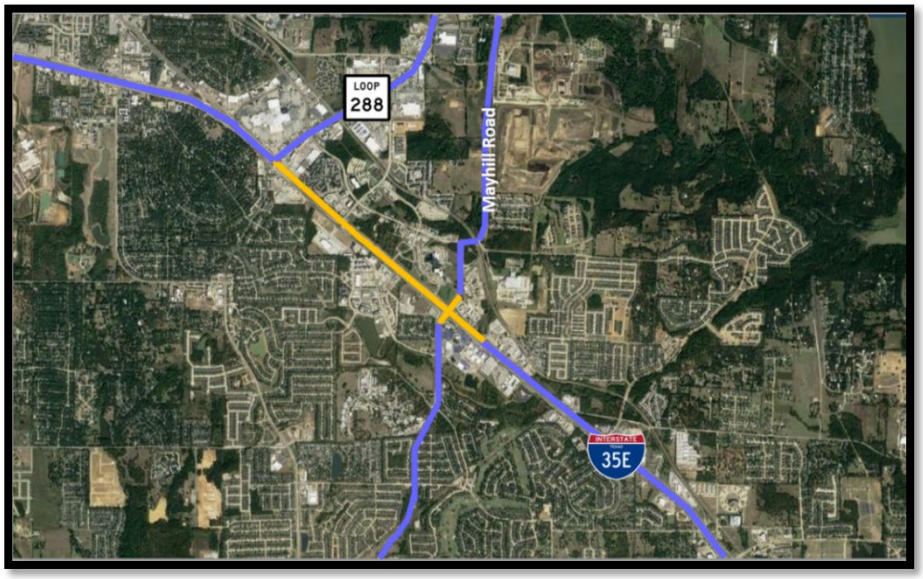
Plans for changes in traffic patterns: None

Item(s) of work currently controlling project completion: Bridge structures and reinforced concrete pipe placement.

Other items of significance: None

I-35E/Mayhill

CSJ:	0196-01-109	**Schematic Approval:**	February 2011
Limits:	I-35E intersection with Mayhill from Pockrus Page Rd to Loop 288	**Environmental Clearance:**	January 31, 2012
Length:	1.912 miles	**ROW Acquisition Completed:**	November 2022
Description:	Reconstruct interchange at Mayhill and I-35E and existing 4-lane frontage roads	**Utility Relocations Complete:**	August 2025
Construction Cost:	$123,539,232	**City of Denton Utility Relocations Completed:**	February 2024
Construction Funding:	$139,130,349 CAT 2: $129,130,349 CAT 4: $10,000,000	**100% Plans:**	November 2024
Firm & Key Contact:	LTRA, Tyler Martin	**Let Date:**	June 5, 2025
TxDOT Project Manager:	Chaikou Bah	**Construction Start:**	*

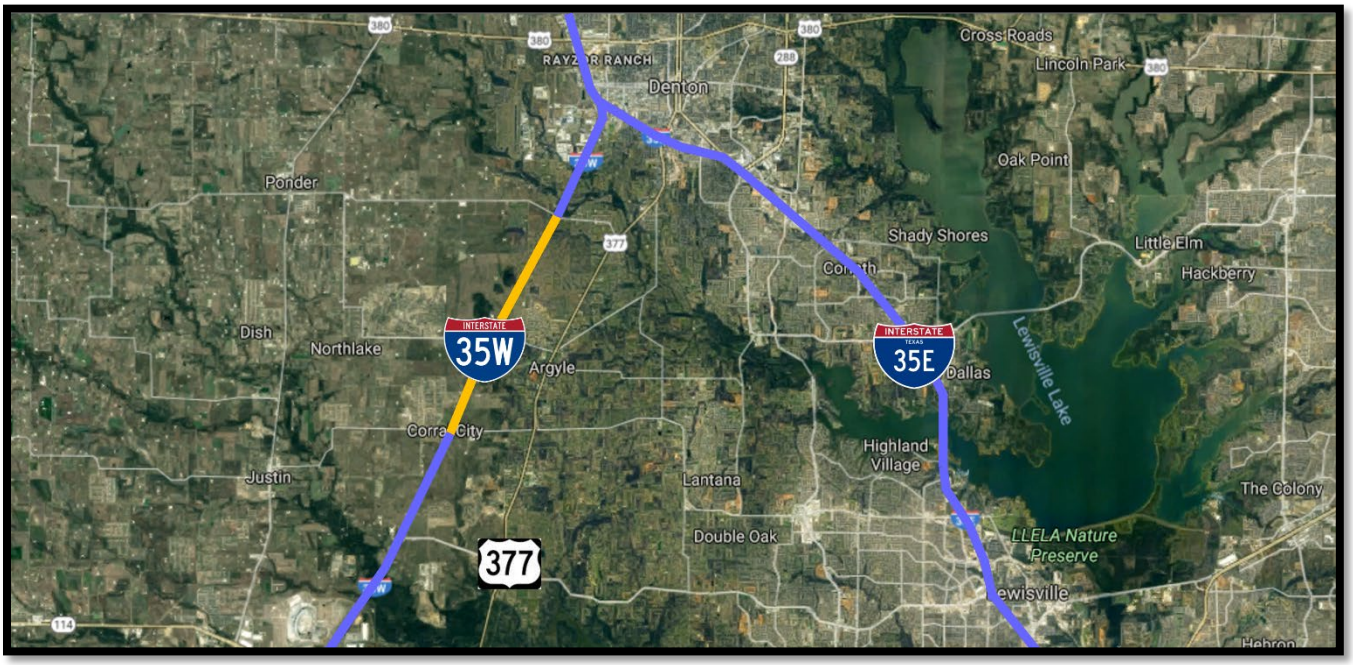


Current Activity:

- **Utilities:** The status of utilities in conflict is listed below.
  - Utilities currently clear of construction: Atmos Gas (Distribution), AT&T, CoServ Gas, City of Denton Water, City of Denton Wastewater, DISD, NGG, Oncor, and United Private Networks.
  - Utilities that are currently relocating: Astound (Grande), Brightspeed/CenturyLink, Charter/Spectrum, DISD, DME, Frontier, Lumen/Level 3, and Zayo.
  - Utilities that are pending relocation: None.
  - Utilities that are critical path: DME is placing new poles needed for Charter and Frontier to complete. Brightspeed, Frontier, Grande, and Lumen splicing estimated for September 2025.
- **Construction:** The project let for construction on June 5, 2025. Apparent low bidder is Zachary Construction Corporation with a low bid of $123,539,232.30, at 16.2% below engineer's estimate. There are 981 working days and 40 months of barricades. Contract has 120-day delay. TxDOT is evaluating utility clearance date and coordinating with Zachary on start date.

I-35W Frontage Roads Middle

CSJ:	0081-13-071	**Schematic Approval:**	March 20, 2020
Limits:	From 0.7 miles south of FM 407 to FM 2449	**Environmental Clearance:**	June 30, 2020
Length:	6.76 miles		
Project Description:	Construct frontage roads	**ROW Acquisition Complete:**	June 2026
Est. Construction Cost:	$260,713,231	**Utility Relocations Complete:**	December 2027
Construction Funding:	$213,024,000 CAT 2: $24,537,247 CAT 12: $188,486,753	**100% Plans:**	December 2025
Firm:	WSP	**Ready to Let Date:**	December 2027
TxDOT PM:	Gutema Gebriel	**Let Date:**	September 2028

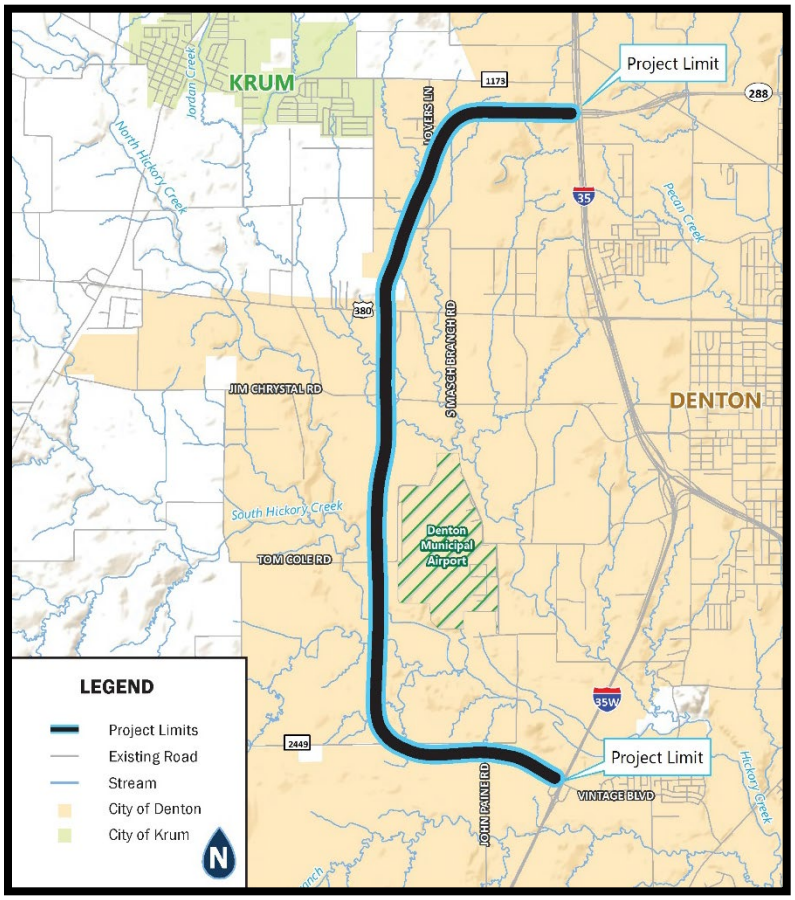


Current Activity:

- **PS&E:** WSP continues addressing TxDOT comments to 95% plan set and is working toward completion of final plan set.
- **ROW:** There are 58 parcels to acquire. There are: 3 parcels in ED and 55 parcels acquired. ROW acquisition has been placed on hold due to District budgetary constraints.
- **Utilities:** The status of utilities in conflict is listed below.
    - Utilities that are clear of construction: DME Transmission and UTRWD.
    - Utilities that are currently relocating: None.
    - Utilities that are pending relocations: Atmos, CoServ Electric, DME Distribution, Fiberlight, Frontier, Fiberlight, Lumen, and Zayo.
    - Utilities that are critical path: CoServ pole placement design and placement is needed for telecoms to finalize their design.

Loop 288 West Frontage Roads

CSJ:	2250-00-013 (from I-35 to US 380) 2250-00-032 (from US 380 to I-35W)	**Schematic Approval:**	March 20, 2020
Limits:	From I-35 to I-35W	**Environmental Clearance:**	September 28, 2020
Length:	9.0 miles		
Description:	Construct frontage roads	**ROW Acquisition Complete:**	December 2025
Estimated Construction Cost:	$227,423,354 **-013:** $95,315,990 **-032:** $132,107,364	**Utility Relocations Complete:**	April 2026
ConstructionFunding:	$3,000,000 CAT 3 $1,000,000 CAT 7	**100% Plans:**	December 2025
Firm & Key Contact:	CP&Y, Tom Cochill & Jacob Roberts	**Ready to Let Date:**	April 2026
TxDOT Project Manager:	Gutema Gebriel	**Let Date:**	Pending Funding

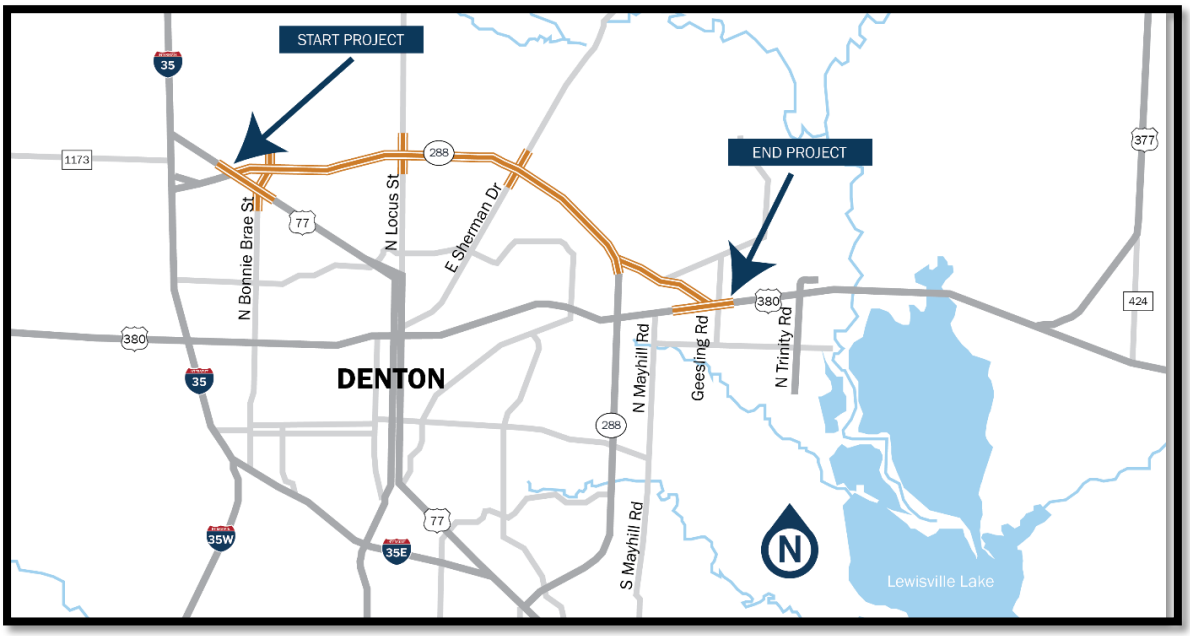


Current Status:

- **ROW:** For RCSJ 2250-02-023, there are 19 parcels to acquire. There are: 2 parcels in ED and 17 parcels in possession. For RCSJ 2250-02-024, there are 20 parcels to acquire. There are: 5 parcels in negotiations and 15 parcels in possession.
- ROW acquisition efforts are on hold due to District budgetary constraints.
- **PS&E:** CP&Y updated PBLR for final submittal.
- CP&Y updated Exhibit A and made final submittal on September 30, 2024.
- The 95% PS&E plan set submittal was made on September 3, 2024. The comment resolution meeting was held on January 28, 2025. CP&Y continued addressing comments and working toward final submittal.
- TxDOT requested revised traffic numbers; CP&Y awaiting new pavement design to finalize submittal.
- Bi-weekly coordination meetings underway.
- **Utilities:** SUE Level A submittal was made on October 11, 2024. Completed two Level A test holes for gas pipeline crossing per TxDOT request. Investigated conflict with Enterprise and Atmos Gas lines.

Loop 288 East-US 380 Connector

CSJ:	2250-02-025; 0135-10-066; 0135-10-066	**Schematic Approval:**	December 2025
Limits:	from I-35 to US 380 east of Geesling Road	**Environmental Clearance:**	July 2026
Length:	8 miles		
Project Description:	Construct Loop 288 frontage roads and grade separations and an improved connector to US 380	**ROW Acquisition Completion:**	*
Estimated Const. Cost:	$1.262 billion	**Utility Relocations Completion:**	*
Construction Funding:	$0	**100% Plans:**	*
Firm & Key Contact:	Westwood, Mark Schluter, Mark Zoellner	**Ready to Let Date:**	*
TxDOT PM:	Stephen Endres	**Let Date:**	*

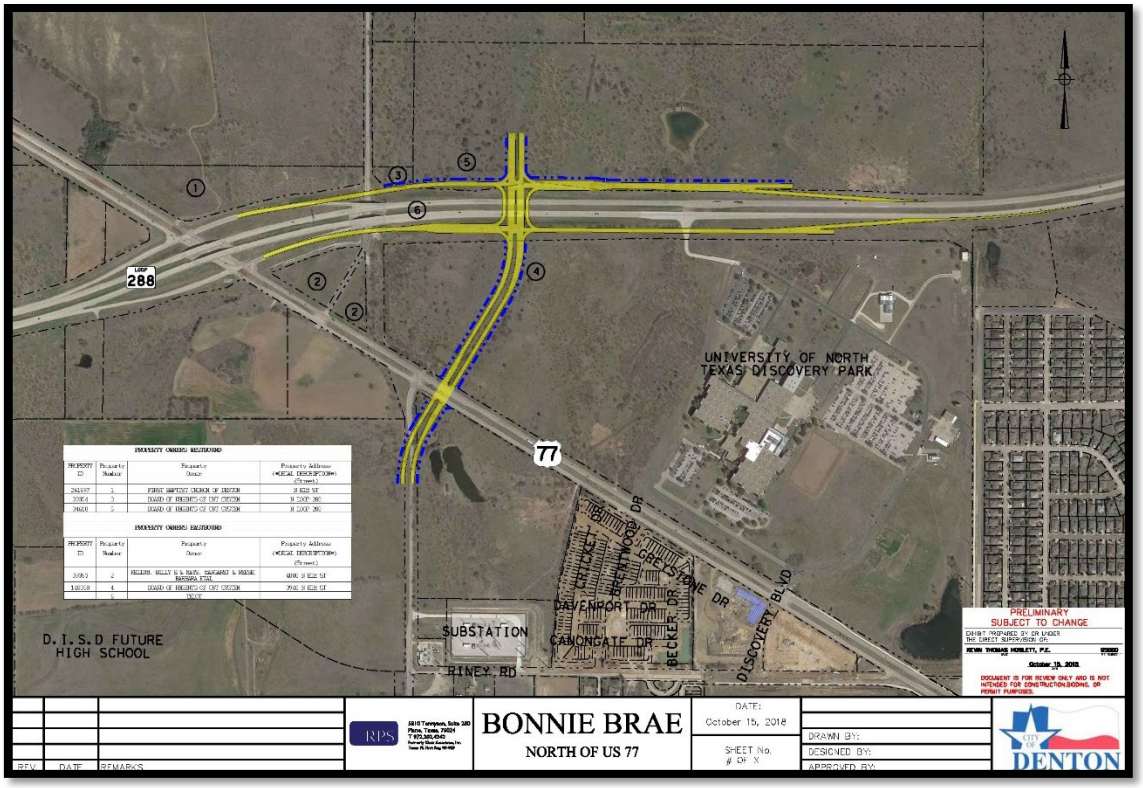


Current Activity:

- **PS&E:** Westwood completed 100% review comments on May 2, 2025. Westwood is making minor right-of-way footprint revisions to schematic.
- Westwood is coordinating with City of Denton regarding Transpere Facility Development on northeast corner of Geesling and incorporating schematic concept. Monthly coordination meeting with City of Denton held on August 7, 2025.
- Westwood is updating estimates, completing traffic control plan, and finalizing TxDOT forms.
- **Environmental:** Public hearing date is expected to be held in February 2026. TxDOT approved project for an Environmental Assessment (EA). Westwood continues working on Environmental Assessment and Technical Reports. Weekly meetings with environmental coordinator underway.

Bonnie Brae Segment 7

CSJ:	*	**Schematic Approval:**	June 2025
Limits:	From US 77 to Loop 288	**Environmental Clearance:**	December 2025
Length:	0.2 miles	**ROW Acquisition Complete:**	*
Description:	Extension of Bonnie Brae north of US 77	**Utility Relocations Complete:**	*
Est. Construction Cost:	*	**100% Plans:**	*
Construction Funding:	*	**Ready to Let Date:**	*
Firm & Key Contact:	Westwood, Mark Schluter, Mark Zoellner	**Let Date:**	*
TxDOT Project Manager:	Stephen Endres	**Construction Start:**	*

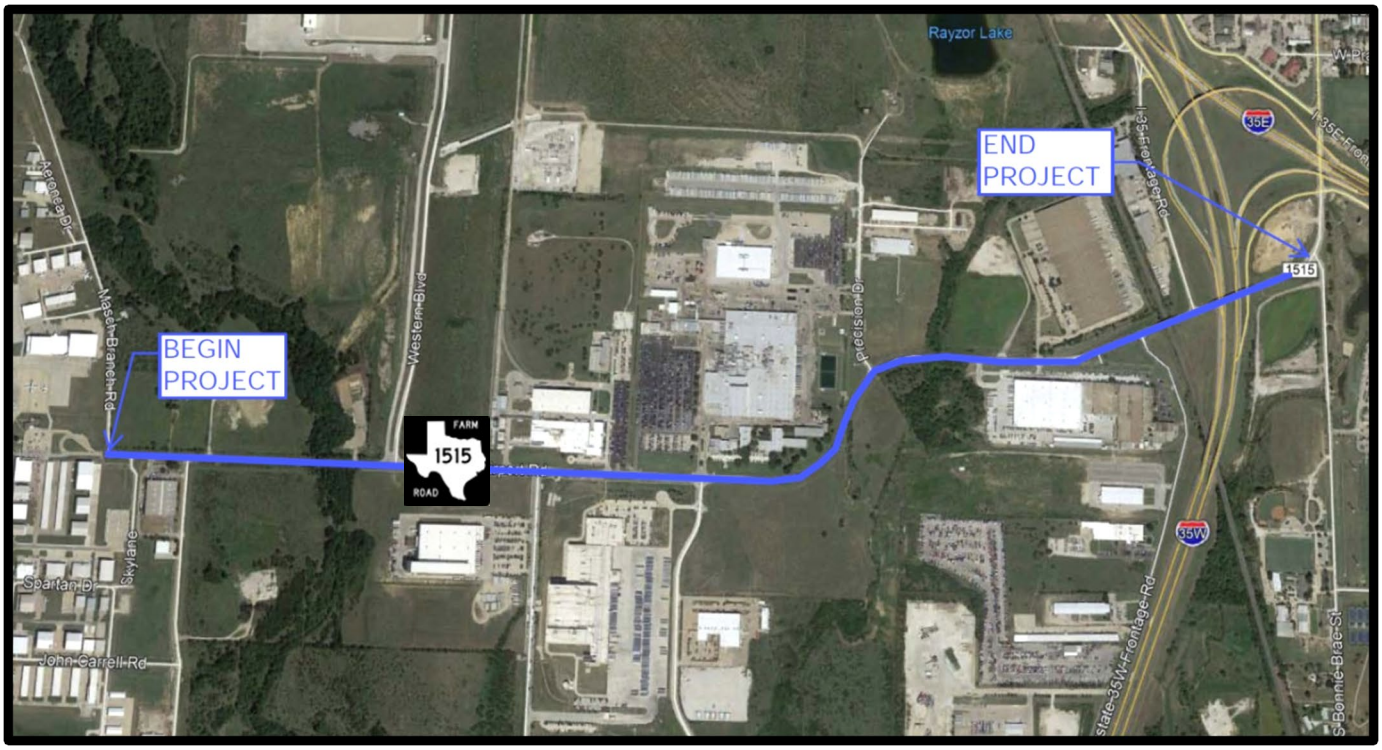


Current Activity:

- **PS&E:** The segment between US 77 and Loop 288 has been added to Loop 288 East contract with Westwood.

FM 1515

CSJ:	1951-01-011	**Schematic Re-approval:**	October 13, 2021
Limits:	From Bonnie Brae to Masch Branch Road	**Environmental Approval:**	August 4, 2020
Length:	2.096 miles	**Environmental Re-eval:**	March 15, 2022
Description:	Widen existing 2-lane rural section to a six-lane divided urban roadway	**ROW Acquisition Complete:**	July 2023
Est. Construction Cost:	$69,484,709	**Utility Relocations Complete:**	March 2027
Construction Funding:	$500,000 CAT 7	**100% Plans:**	June 2024
Firm & Key Contact:	LTRA, Tyler Martin	**Ready to Let Date:**	March 2027
TxDOT Project Manager:	Bryan Esmaili-Doki	**Let Date:**	Pending Funding



Current Activity:

- **PS&E:** LTRA updated plans to the 2024 TxDOT Specifications and submitted the final plan 6-25set on June 28, 2024. Plans have been shelved until letting.
- **Exhibit A:** LTRA submitted new Exhibit A for CPKC approval.
- **Utilities:** The status of utilities in conflict is listed below.
  - Utilities that are clear of construction: None
  - Utilities that are currently relocating: None
  - Utilities that are pending relocation: AT&T, Atmos, Brightspeed/CenturyLink, Charter/Spectrum, City of Denton Water/Wastewater, DME Distribution, Lumen, MCI/Verizon, and UPN.
  - Utilities that are critical path: City Water needs to be placed prior to Atmos. City SUA in process. DME poles are needed for telecoms to begin. Atmos to begin relocations in October 2025.

FM 1173

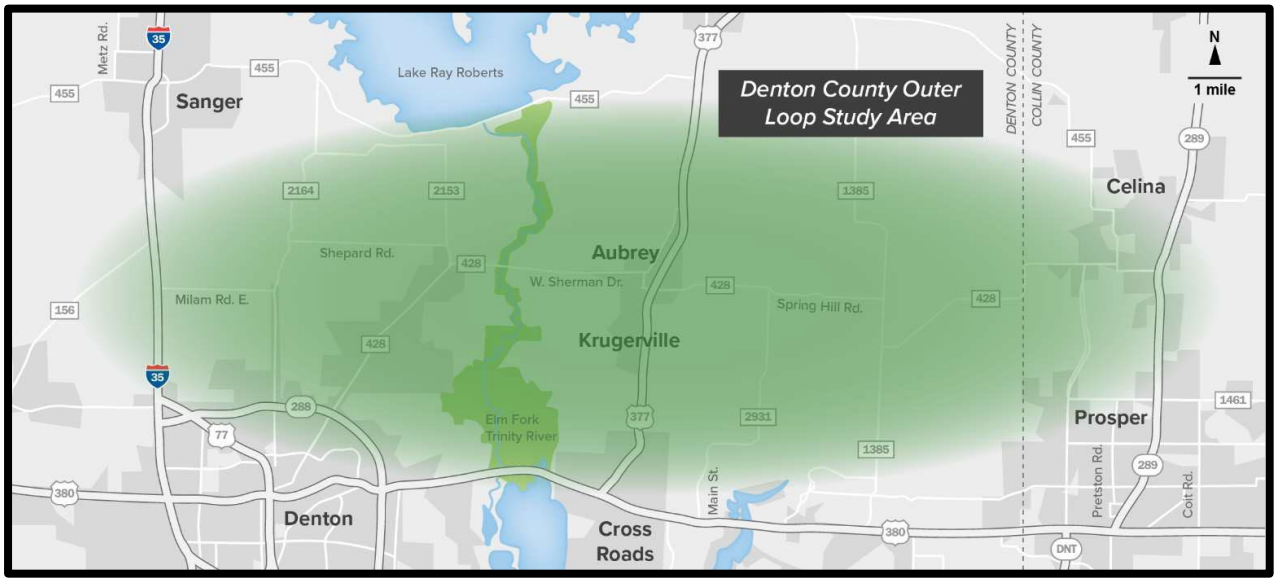
CSJ:	1059-01-047; 1059-02-002	**Schematic Approval:**	March 20, 2020
Limits:	From I-35E to FM 156	**Environmental Clearance:**	August 26, 2021
Length:	3.613 miles		
Description:	Widen and realign to 4/6-lane divided urban road	**ROW Acquisition Completed:**	September 2023
Est. Construction Cost:	$125,852,145 -047: $62,892,803 -002: $62,959,342	**Utility Relocations Complete:**	June 2026
Construction Funding:	$0	**100% Plans:**	May 2025
Firm & Key Contact:	Halff Associates, Adam Bazar	**Ready to Let Date:**	June 2026
TxDOT PM:	Kwan Lam	**Let Date:**	Pending Funding

Current Activity:

- **PS&E:** Halff resubmitted final PS&E plan set on May 10, 2025.
- Halff submitted BNSF Exhibit A on September 24, 2024.
- **Utilities:** The status of utilities in conflict is listed below.
  - Utilities that are clear of construction: None.
  - Utilities that are currently relocating: AT&T, Atmos Distribution, CoServ Electric, City of Denton Sewer, and Oncor.
  - Utilities that are pending relocations: Altice, Atmos, Brightspeed, City of Krum Water/Sewer, Fiberlight, and Zayo.
  - Utilities that are critical path: City of Krum Water/Sewer; Atmos line resolution to avoid adjusting, and CoServ and Oncor poles need to be placed for telecoms.

Outer Loop

CSJ:	0918-46-341	**Schematic Approval:**	March 2026
Limits:	From I-35 to the DNT at the Denton County Line	**Environmental Clearance:**	September 2026
Length:	23 miles	**ROW Acquisition Complete:**	*
Description:	Construct a six-lane controlled access freeway with continuous frontage roads	**Utility Relocations Complete:**	*
Est. Construction Cost:	$1,547,212,128	**100% Plans:**	*
Construction Funding:	$0	**Ready to Let Date:**	*
Firm & Key Contact:	LJA, Tony Kimmey	**Let Date:**	*
TxDOT Project Manager:	Liang Ding	**Construction Start:**	*



Current Activity:

- **Design:** LJA submitted 60% schematics to TxDOT for review on July 7, 2025. LJA is preparing schematic for public meeting.
- LJA continues coordination with NCTCOG, TxDOT, USACE, and other agencies.
- Traffic projections were updated to include the limits east of DNT. Completed crash data review for 2023 and 2024. LJA is working on traffic.
- **Utilities:** LJA continues developing utility conflict matrix. LJA continues developing Level D map. LJA is coordinating and identifying areas to perform Level B SUE. LJA is working to develop utility cost estimate and utility easements.
- **Environmental:** Evaluating easements and TxDOT property near USACE property. Reviewing additional constraints and areas of concern. Archeological survey is in progress.
- **Other:** Project website is available: www.DentonCountyOuterLoop.com.
- **Public Involvement:** Anticipate public meetings to be held from 5:30 to 7:30 p.m. on September 29, 2025, at the Denton Convention Center (Embassy Suites) and on September 30, 2025, at the Midway Church (gymnasium in Aubrey/Pilot Point). LJA is preparing for public meeting.

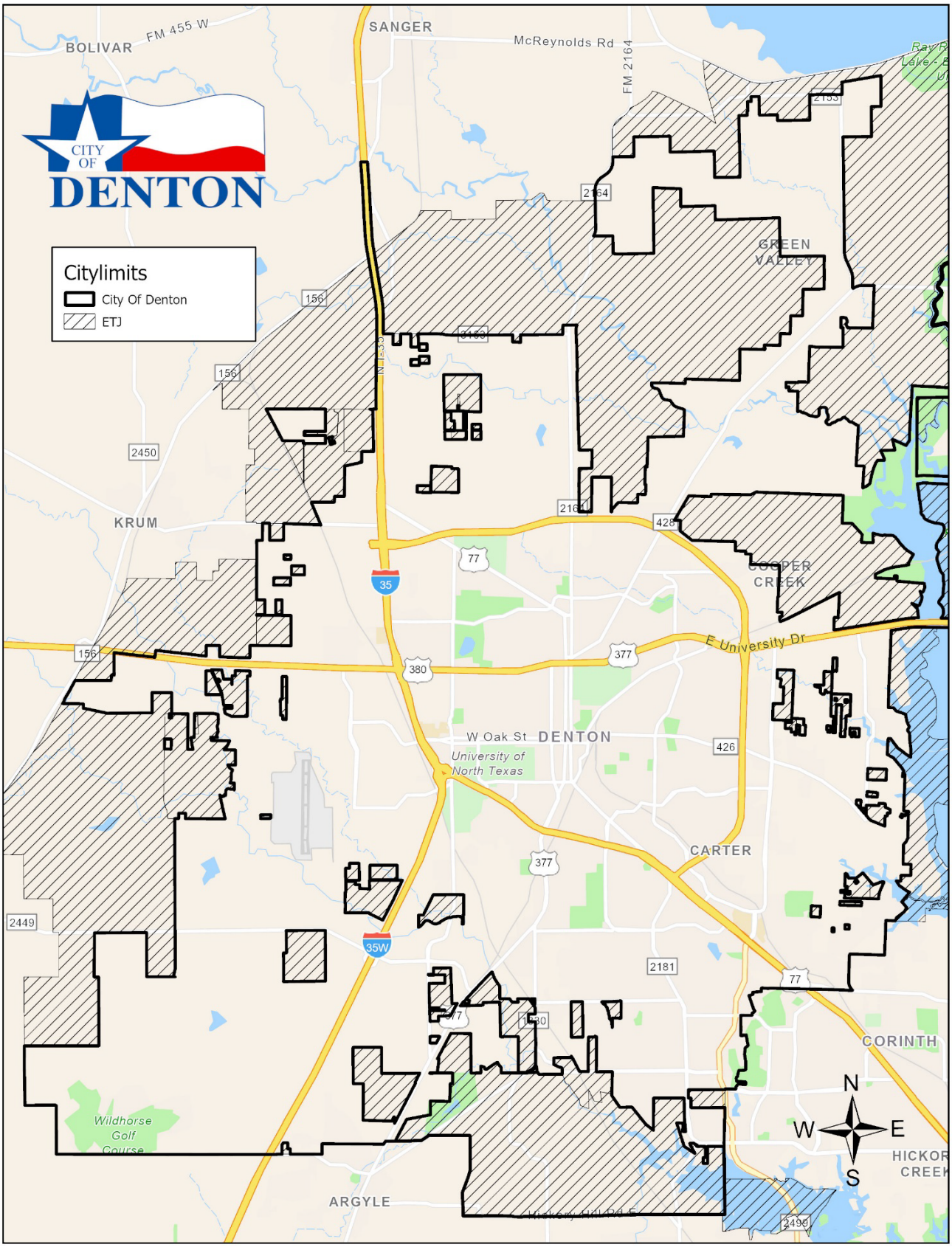
Glossary of Acronyms

- AADT – Annual Average Daily Traffic
- AFA – Advanced Funding Agreement
- ARPA – Archeological Resources Protection Act
- CE – Categorical Exclusion (environmental clearance process for projects that do not involve significant environmental impacts)
- CLOMR – (FEMA's) Conditional Letter of Map Revision
- Conformity – Federal requirement in nonattainment areas to conduct air quality analysis on projects, programs, and policies identified in transportation plans, transportation improvement programs, federally funded projects, or projects requiring federal approval
- CSJ – (TxDOT's) Control Section Job Number
- DCC – Design Concept Conference
- EA – Environmental Assessment
- ED – Eminent Domain
- EIS – Environmental Impact Statement
- EPIC – Environmental Permits, Issues, and Commitments
- ESAL – Equivalent Single Axle Load (TxDOT design calculation)
- FONSI – Finding of No Significant Impact
- IAJR – Interstate Access Justification Request
- ICA – Interlocal Cooperative Agreement
- IFP – Initial Financial Plan
- Let – Official date of receipt and opening of bids
- MAPO – Meeting with Affected Property Owners
- MPO – Metropolitan Planning Organization
- MTP – Metropolitan Transportation Plan
- NCTCOG – North Central Texas Council of Governments
- NEPA – National Environmental Policy Act
- NOPC – Notice of Proposed Construction
- NTTA – North Texas Toll Authority
- PBLR – Preliminary Bridge Layout Review
- PS&E – Plans Specifications and Estimate
- PUA – Possession and Use Agreement
- ROW – Right-of-Way
- RTC – Regional Transportation Council
- RTL – Ready to Let (date project is clear for construction but lacks funding for actual let)
- RTR – Regional Toll Revenue (funds resulting from certain toll/managed lane projects in DFW region)
- RULIS – Right-of-Way, Utilities, Leasing, and Information System
- STBG – Surface Transportation Block Grant
- STIP – Statewide Transportation Improvement Program
- SUE – Subsurface Utility Engineering
- SW3P – Storm Water Pollution Prevention Plan
- TCP – Traffic Control Plan
- TIA – Time Impact Analysis
- TPP – Transportation Planning and Programming
- TPWD – Texas Parks & Wildlife Department
- TTC – Texas Transportation Commission
- TxDOT – Texas Department of Transportation
- UTP – Unified Transportation Program
- VE – Value Engineering

TxDOT Funding Categories

- CAT 1: Preventive Maintenance and Rehabilitation
- CAT 2: Metro and Urban Area Corridor Projects / NCTCOG
- CAT 3: Non-Traditionally Funded Transportation Projects
- CAT 4: Statewide Connectivity Corridor Projects
- CAT 5: Congestion Mitigation and Air Quality Improvement / NCTCOG
- CAT 6: Structures Replacement and Rehabilitation (Bridge)
- CAT 7: Metropolitan Mobility and Rehabilitation / NCTCOG
- CAT 8: Safety Projects
- CAT 9: Transportation Alternatives
- CAT 10: Supplemental Transportation Projects
- CAT 11: District Discretionary
- CAT 12: Strategic Priority

Denton City Limits



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Upcoming Community Events and Public Meetings

Please visit the City of Denton website for upcoming community events and details.

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INFORMAL STAFF REPORT
TO MAYOR AND CITY COUNCIL

SUBJECT:
Provide a summary of bills passed by the 89th Legislature's Regular Session that require the City of Denton to implement new procedures and/or make code amendments.

BACKGROUND:
The 89th Legislature convened on January 14, 2025, and adjourned on June 2, 2025 for the biannual, 140-day legislative session. In total, 8,719 bills were filed and 1,213 were passed and/or sent to the Governor. As a political subdivision of the State, the City of Denton has a vested interest in the actions taken by the State Legislature during session. Of the 1,213 bills passed, roughly 260 of them relate to city business. Following the veto period, which ended on June 22, 2025, staff reviewed the bills passed and have developed plans to implement the bills that require action from the City of Denton.

DISCUSSION:
This report outlines the bills that necessitate policy or code amendments, departmental process changes, new training or reporting requirements, and other implementation efforts across City departments. It also includes estimated timelines for Council consideration and implementation.

Regulation

Bill	Summary	Action	Est. Council Consideration	Est. Implementation
HB 2464	Prohibits municipalities from regulating a home-based business	Policy/Code Amendment	11/19/2025	11/19/2025
HB 303	Deregulation of honey production operations.	Department process change	N/A	9/1/2025
SB 1008	Regulation of food service industry.	Department process change	N/A	9/1/2025
HB 2844	Regulation of mobile food service establishments.	Policy/Code Amendment	Spring 2026	7/1/2026

HB 2464 prevents cities from prohibiting the operation of or requiring a license or permit to operate a no-impact home-based business. The bill became effective immediately upon passage, and staff have reviewed all home occupation business requests to ensure compliance. The new law requires an update to the Denton Development Code to amend existing definitions of a "no-impact home business", as well as amending the use specific standards for home businesses. Implementation will be completed upon Council consideration on October 21, 2025.

HB 303 prevents cities from regulating honey production operations. The City does not currently regulate the *production* of honey but does regulate *sellers* of honey as a permitted agricultural vendor or farmers market food vendor. With the implementation of this law, the City will not regulate sole honey production operations and establishments and/or vendors that sell only honey products will not be required to obtain a farmers market food permit. HB 303 goes into effect and all process changes were be implemented on September 1, 2025.

SB 1008 provides new provisions for city regulation of the food service industry. Specifically, restricting the requirement(s) of a permit, license, or certification of food service establishments to only if the same requirement(s) would apply to a similar entity or person within the city limits, and prohibits a city from charging an establishment for a permit fee for the retail sale of alcohol if the establishment has already paid a fee to any county, city, or public health district, or a fee that would be paid to the Texas Department of State Health Services. Additionally, it prohibits a city from requiring a food service establishment to obtain a sound regulation permit, charging a sound regulation fee, or otherwise prohibiting sound-related activity. The implementation of this law will require minor department process changes, including the development of a schedule of fees to be submitted to the Department of State Health Services. Currently, the City only regulates and/or permits establishments that would be regulated by the Department of State Health Services at a cost that is less than the DSHS permitting fee and does not prohibit sound-related activities at a food service establishment outside of the current city sound regulation that does not conflict with this new or existing state law. The implementation of this law were completed on September 1, 2025.

HB 2844 preempts a city, county, or public health district from requiring small-scale and/or mobile food businesses to obtain a permit or pay a permitting fee to operate a food service establishment if the business holds a permit issued by the Texas Department of State Health Services for that purpose or is a licensed food manufacturer. Additionally, it preempts a city's authority to regulate mobile food vending in a way that conflicts with state law and requires the Health and Human Services Commission to adopt rules for mobile food vendors to address health and safety risks. This new law will require amendment(s) to the City of Denton Code of Ordinances, Chapter 13 – Food and Food Service Establishments by July 1, 2026. Staff will present these changes to Council for consideration in Spring of 2026. Additionally, the bill continues to allow cities to regulate mobile food businesses through the zoning code and fire code. Staff are currently working on the proposed code amendments presented to Council on April 1, 2025, as well as conducting the food truck public engagement as requested by Council.

Land Use

Bill	Summary	Action	Est. Council Consideration	Est. Implementation
HB 24	Modifies procedures for changes to a zoning regulation or district boundary	Policy/Code Amendment	11/18/2025	11/18/2025
HB 2025	Modifies the filing for record of a plat, replat, or amended plat or replat of a subdivision of real property or a condominium.	Department process change	N/A	9/1/2025
HB 2512	Clarifies the requirements for requesting removal from a city's ETJ	Department process change	N/A	8/1/2025
SB 1341	Amends the definition of "manufactured home" to the statutory citation for the definition of manufactured home under federal law.	Policy/Code Amendment	11/18/2025	11/18/2025
SB 1883	Relating to the approval of land use assumptions, capital improvement plans, and impact fees.	Policy/Code Amendment	9/30/2025	11/18/2025
SB 2965	Relating to territory in an emergency services district that is annexed by a municipality	Department process change	N/A	9/1/2025
SB 1567	Relating to the authority of home-rule municipalities to regulate the occupancy of dwelling units.	Code/Policy Amendment	11/18/2025	11/18/2025

HB 24 modifies the procedures and requirements for protests of a proposed change to a zoning regulation or district boundary. Specifically, it requires a protest must be written and signed by the owners of; a) at least 20 percent of the area of the lots or land covered by the proposed change, or b) at least 60 percent of the area of the lands or land immediately adjoining the area covered by the proposed change and extending 200 feet from the proposed change area.

The implementation of this new law will require amendments to the Denton Development Code to reflect the new procedures and population thresholds for protests. The Council will have the opportunity to review and consider the revisions on November 19, 2025, and implementation will follow Council's consideration.

HB 2025 eliminates the requirement for a plat record, replat, or amended plat request to attach a tax receipt indicating that the taxes imposed by the applicable taxing units have been paid or not yet been calculated. The City will modify the current process for plat requests to remove the tax receive requirement as of September 1, 2025.

HB 2512 requires that a resident may only file a petition for release from the ETJ if the resident resides in the area subject to release, and if a city receives a petition for release, the city must provide notice to the residents and landowners no later than the seventh business day after the date of receipt. Additionally, the bill stipulates that before an area is released from the ETJ by election, a landowner in the area must be provided with an opportunity to have their property remain within the city's ETJ. The bill also explicitly allows the reduction in size of a city's ETJ by an ETJ removal petition without the consent of the City Council. Implementation of this bill will adhere to the City's litigation position.

SB 1341 amends the definition of "manufactured home" to the statutory citation for the definition home under federal law. While the implementation of this bill will not require any process changes, the Denton Development Code will be amended to reflect the new definition. Council will consider the code amendment on November 18, 2025.

SB 1883 makes several changes to the assessment and collection of impact fees. It requires cities to make land use assumptions and capital improvement plans publicly available at least 60 days prior to the first publication of notice for any public hearing on those plans; it changes the approval threshold for the imposition of an impact fee, now requiring a two-thirds supermajority vote by the governing body; and imposes a three-year moratorium on increasing impact fees after they are adopted or last raised. Additionally, it amends the advisory committee (Capital Improvement Advisory Committee) composition requirements, raising the industry representation threshold from 40 to 50 percent, and removes the provision allowing planning and zoning commissions to serve as the advisory committee. Lastly, it mandates an independent financial audit prior to the adoption or increase of an impact fee. The bill will require the City to amend city ordinances to establish a new Capital Improvement Advisory Committee, as the Planning and Zoning Commission will no longer be eligible to serve in that capacity. Staff will share information regarding this new committee on September 30, 2025. While the bill decreases the frequency of impact fee updates to every three years, work that is currently in progress is allowed to continue under the bill's provisions if it is completed by December 1, 2025.

SB 2965 prohibits the disannexation of territory from an emergency services district (ESD) by a city if the city cannot meet or exceed the services currently being provided by an ESD, and creates a process for an ESD to contest the removal of territory from an ESD once it is annexed by a city. The process created by the bill compels a city and an ESD to binding arbitration if there is a disagreement about whether the city can provide adequate emergency services to the area the city seeks to remove from the ESD. There are areas in southern Denton where the City's ETJ overlap with Denton County ESDs. This bill requires minor modifications to department standard operating procedures that were implemented by staff by September 1, 2025.

SB 1567 prohibits a city from adopting or enforcing a zoning ordinance that limits the number of people who may occupy a dwelling unit based on age, familial status, occupation, relationship

status, or relation to each other. The Denton Development Code currently restricts the number of non-related occupants in a single unit to four. A code amendment to remove the existing standards will be necessary to comply with this new law and will be brought to Council for consideration on October 21, 2025.

City Administration

Bill	Summary	Action	Estimated Council Consideration	Estimated Implementation
HB 132	Confidentiality of information used to prevent, detect, respond, or investigate a hostile act of a foreign adversary.	Department process change	N/A	9/1/2025
HB 149	Provides that a government agency that makes available an artificial intelligence (AI) system that is intended to interact with consumers must disclose to each consumer and limits the use of AI and biometric data.	Department process changes	N/A	9/1/2025
HB 762	Limitation of severance pay for city employees and contractors.	New/Updated contract language	7/22/2025	8/19/2025
HB 1522	Relating to notice of a meeting held under the open meetings law.	Department process change	N/A	9/1/2025
HB 3112	Confidentiality of cybersecurity discussions	Department Process Change	N/A	9/1/2025
HB 3512	Requires municipal employees and officials to complete artificial intelligence training.	New training	N/A	8/31/2026
HB 4214	Public access to the mailing address and email to request public information under the public information law.	New reporting requirement	N/A	9/1/2025
HB 5331	Prohibits a municipality's cybersecurity insurance contract from circumventing state laws related to cybersecurity incident reporting.	New contract language	N/A	9/1/2025
SB 1173	Increases the competitive bidding threshold from $50,000 to $100,000.	Policy/code amendment	10/21/2025	10/21/2025
SB 1964	Requires local governments to complete a review of the	New department process	N/A	Awaiting state rule making

	deployment and use of a heightened scrutiny artificial intelligence system.			
SB 2570	Legal justification for the use of force with a less-lethal force weapon.	Department Process Change	N/A	9/1/2025

HB 132 amends existing law to make confidential the information collected, assembled, or maintained by or for a governmental entity for the purpose of preventing, detecting, or responding to an act of terrorism or related criminal activity. This new law will modify potential responsive documents subject to the Public Information Act. Staff is aware of this change and are in compliance with the new law by September 1, 2025.

HB 149 provides that a government agency that makes available an artificial intelligence (AI) system that is intended to interact with consumers must disclose to each consumer, before or at the time of interaction, that the consumer is interacting with an AI system. It prohibits a government agency from using an AI system for social scoring purposes and prohibits a government entity from developing or deploying an AI system with biometric identifiers of individuals and the gathering of images or other media for the purpose of uniquely identifying a specific individual, if doing so, would infringe any right guaranteed under state or federal law. The City does utilize an AI chat feature on the City website. Staff will update the feature to include a disclaimer to ensure compliance with this new law. The City is not currently in the practice of utilizing social scoring or utilizing AI with biometric identifiers that would infringe upon any state or federal rights protections. Staff is conducting additional reviews to ensure all consumer facing AI is identified and appropriately disclosed.

HB 762 limits the severance pay for government employment agreements and contracts entered into after September 1, 2025. For agreements and contracts entered into after September 1, 2025, severance pay for employees and contractors of political subdivisions is limited to no more than 20 weeks, excluding accrued paid time off or vacation leave. Additionally, the bill prohibits the provision of severance pay if the employee or contractor is terminated for misconduct and requires severance agreements to be posted on the subdivision's website. The City's current hiring practice only provides for employment contracts with the four Council appointed positions, City Manager, City Attorney, City Auditor, and Municipal Judge. Staff provided this information to Council on July 22, 2025, and updated contracts were approved by Council on August 19, 2025.

HB 1522 modifies the Open Meetings Act to require the notice of a meeting to be posted at least three business days prior to the scheduled date of the meeting, while the previous provision allowed for 72-hour notice. Staff have modified the posting schedule for City Council meetings, as well as all boards, commissions, and committees. It has been the practice for staff to post the City Council meeting agenda by 5:00 pm on the Friday before the Tuesday meeting. With this new requirement,

City Council meeting agendas will be posted by 5:00 pm on the Wednesday before the meeting. **Attached** is the posting guide shared with departments to ensure compliance with the new law.

HB 3112 modifies the Open Meetings Act to allow governmental bodies to convene in closed session to deliberate matters related to cybersecurity, and/or measures intended to protect critical infrastructure within the entity's jurisdiction. Staff have added this provision to the existing exemptions claimed under the Open Meetings Act and are in compliance with the new law.

HB 3512 requires local government employees and elected/appointed officials to complete a certified artificial intelligence (AI) training program. It requires the Texas Department of Information Resources (DIR) to certify at least five AI training programs for state and local employees to utilize. DIR has not yet published the list of training programs and resources on their public webpage. Once it is made available through DIR, staff will provide additional instructions on the training as they incorporate it into the city's existing training program.

HB 4214 requires governmental bodies to notify the attorney general of the mailing and electronic address designated to receive written requests for public information and requires the attorney general to create and maintain a publicly accessible database of these addresses. The notice must be provided to the attorney general by October 1 of each year. The Attorney General's Office has communicated their intention to accept these notices once the database is in place. Staff will maintain communication with the office and will implement a procedure to ensure annual compliance.

HB 5331 provides that contract language in a cybersecurity insurance contract or contract for goods and services that restricts a state agency or local government's compliance with or otherwise circumvents state laws that require notification of cybersecurity incidents to Texas DIR is void and unenforceable. Staff are reviewing existing contracts to ensure compliance and will provide standard language to this effect on future contracts, amendments, and renewals.

SB 1173 increases the competitive bidding threshold from $50,000 to $100,000. The competitive bidding threshold is the threshold at which competitive bidding (procurement process) is required for city purchases. Implementation will require revising the City's procurement policy to reflect the new threshold, which will require Council consideration. Staff will bring this item forward on October 21, 2025.

SB 1964 requires local governments to complete a review of a heightened scrutiny artificial intelligence system and provide the review to DIR. Additionally, it directs DIR to establish an AI code of ethics for state agencies and local governments that procure, develop, or use a heightened scrutiny AI system and develop standards for management and governance of these systems. Staff are currently awaiting direction from DIR to ensure compliance with this new law. Staff will also need to review any required notices that need to be provided under Section 2054.711,

SB 2570 provides that a peace officer or guard of a correctional facility who is engaged in the discharge of their official duties is justified in using force with a less-lethal force weapon when and to the degree the person reasonably believes the force was necessary to accomplish the person's duties, and if the person's use of the weapon is in substantial compliance with the person's training. Staff are reviewing department training materials to ensure compliance and will make amendments to the training as necessary.

Denton Municipal Electric (DME)

Bill	Summary	Action	Estimated Council Consideration	Est. Implementation
HB 144	Management, inspection, and reporting requirements for utility distribution poles.	New reporting requirement	N/A	1/1/2027
HB 145	Risk mitigation planning, liability, and reporting requirements for electric providers.	New reporting requirement	N/A	9/1/2025
HB 1584	Relating to the creation of a list of priority facilities by electric utilities.	Department process change	N/A	9/1/2025
HB 1606	Relating to notice provided to a retail electric customer of the procedure for requesting vegetation management near a transmission or distribution line.	Department process change	N/A	8/31/2025
SB 1202	Third-party review of property development documents and inspections of improvements for home backup power installations.	Website update	N/A	9/1/2025
SB 1697	Relating to a customer guide to home solar energy devices.	Department process change	N/A	Awaiting PUC guide release
SB 1789	Relating to electric service quality and reliability; providing an administrative penalty.	Department process change	N/A	Awaiting PUC standards
SB 1991	Relating to information regarding certain charges for services provided by municipally owned utility systems.	Website update	N/A	9/1/2025

HB 144 requires electric utilities that distribute energy to the public to submit to the Public Utilities Commission (PUC) a plan for the management and inspection of distribution poles the utility owns, and no later than May 1 of each year, submit an update to the PUC detailing the entity's compliance with the plan's objectives. This program must be adopted by the PUC by January 1, 2027, and staff will be prepared to comply upon its creation.

HB 145 requires electric utilities to insure or self-insure against potential damages the utility may be liable for resulting from personal injury or property damage caused by wildfire. The bill instructs that the PUC has the authority to approve the insurance plan. The bill also requires utilities to submit a wildfire mitigation plan. DMEs existing vegetation management plan will comply with the requirements of this new plan and will submit it to the PUC upon completion of the rulemaking period.

HB 1584 requires electric utilities to maintain a list of priority facilities in its retail service area and defines "priority facility" as anywhere considered crucial for public safety, including a hospital, police station, fire station, critical water or wastewater facility, or jail. It requires a utility to provide on its website a mechanism for a facility to request to be added to the priority list, as well as requires the list to be provided to Texas Department of Emergency Management (TDEM) upon request. DME maintains a list of critical infrastructure in the city and will prepare for its inclusion on the city's website in order to comply with the new requirements.

HB 1606 requires a municipally owned electric utility to periodically provide information about the procedure for a customer to request vegetation management near a transmission line with bills sent to retail customers. Staff will create additional materials to be included in utility bills that comply with these new requirements.

SB 1202 allows authorized third parties to review development documents and conduct inspections required by a regulatory authority to install home backup power generation. Within 15 days of completing the review, the third party must provide notice to the regulatory authority of the results, and in turn the regulatory authority issue approval within two business days of receiving the notice. Implementation will require minor updates to the permitting process and updating the City's website with the new requirements.

SB 1697 requires the PUC to develop a guide to provide customers with information on solar energy devices for a home and provides that an electric utility provider should include a link to the guide on the utility's website and provide information about accessing the guide on each utility bill. Staff are currently awaiting the publishing of the PUC's guide and will update the website and append information regarding the guide to utility bills upon its release.

SB 1789 requires the PUC to develop standards for pole inspections, repairs, reinforcements, or replacements, and requires electric utilities to report annually on pole maintenance efforts. Additionally, it authorizes the PUC to take action when a utility fails to address degraded

infrastructure. Staff are currently awaiting the publishing of the PUC's standards and will comply with all requirements including annual reporting.

SB 1991 requires a municipally owned utility to publish terms and conditions of operating, maintenance, replacement, or improvement charges on the utility's website within 30 days of the adoption of a change. Currently, rates and descriptions are posted within the timeframe required, and this practice will continue. Staff will review existing procedures and will modify posting language to comply with the new law.

CONCLUSION:

City staff have conducted a thorough review of the applicable legislation and are actively working to ensure timely and compliant implementation. Where necessary, items will be brought forward for Council consideration in accordance with the timelines outlined in this report. Staff will continue to monitor rulemaking processes and provide updates as additional guidance becomes available from state agencies.

ATTACHMENTS:

1. Public Meeting Posting Schedule

STAFF CONTACT:

Kristi Fogle
Chief of Staff
Kristi.Fogle@cityofdenton.com
(940) 349-8565

REQUESTOR: Staff Initiated
STAFF TIME TO COMPLETE REPORT: 40
PARTICIPATING DEPARTMENTS: City Manager's Office, Legal

Three (3) Business Day Posting Schedule

Effective September 1, 2025 all agendas must be posted three (3) business days prior to the scheduled meeting.

DAY TO POST	EFFECTIVE 9/1/25, REQUIRED 3 BUSINESS DAYS			FOR A MEETING ON
Tuesday (8 to 5)	Wednesday 1	Thursday 2	Friday 3	Monday (any time)
Wednesday (8 to 5)	Thursday 1	Friday 2	Monday 3	Tuesday (any time)
Thursday (8 to 5)	Friday 1	Monday 2	Tuesday 3	Wednesday (any time)
Friday (8 to 5)	Monday 1	Tuesday 2	Wednesday 3	Thursday (any time)
Monday (8 to 5)	Tuesday 1	Wednesday 2	Thursday 3	Friday (any time)

REMEMBER! CITY OF DENTON CLOSURE DAYS DON'T COUNT AS BUSINESS DAYS!

Business days are Monday through Friday except for City of Denton recognized holidays.

Holidays* that don't count as business days are as follows:

New Years Day – January 1
Martin Luther King, Jr.'s Birthday – Observed 3rd Monday in January
Memorial Day – Observed last Monday in May
Juneteenth National Independence Day – June 19
Independence Day – July 4
Labor Day – First Monday in September
Veterans Day – November 11
Thanksgiving Day – 4th Thursday in November
Day after Thanksgiving Day – 4th Friday in November
Christmas Eve – December 24
Christmas Day – December 25

*Holidays occurring on Saturday will be observed on the preceding Friday and holidays occurring on Sunday will be observed on the following Monday per City of Denton Policy 107.2.

INFORMAL STAFF REPORT
TO MAYOR AND CITY COUNCIL

SUBJECT:
This informal staff report will provide information regarding the City's participation in the United States Army Corps of Engineers' (USACE) study of the Cooper Creek watershed through the Continuing Authorities Program (CAP) Section 205 and include an overview of the results of the study.

BACKGROUND:
The USACE CAP Section 205 is a program which allows the USACE to partner with a nonfederal sponsor to plan and construct small flood damage reduction projects that have not previously been specifically authorized by Congress and are not part of a larger project. The purpose of the CAP is to plan and implement projects of limited size, cost, scope and complexity.

The City of Denton Environmental Services and Sustainability Department submitted a letter on June 29, 2023, to the USACE Fort Worth requesting assistance for a study to address flooding in the Cooper Creek watershed. The USACE Fort Worth District chose Cooper Creek for a feasibility study authorized under the CAP Section 205. The purpose of this feasibility study was to evaluate potential flood reduction projects at a high level. If a cost-effective project was identified, it would advance to design and construction under the CAP. The estimated cost of the study was $600,000. CAP requires a cost share of a 50% match after the first $100,000. The Federal share for this project was estimated at $350,000 and the City of Denton's share of the projected costs was estimated at $250,000. On March 5, 2024, City Council approved agenda item ID24-243 which allowed the City Manager to enter into a Feasibility Cost Sharing Agreement (FCSA) with the USACE and contribute $250,000 for the City's portion of the cost share.

DISCUSSION:
As USACE staff performed the feasibility analysis within Cooper Creek, City staff offered continual support and input, regularly met with USACE staff to provide information on historic flooding issues, utility conflicts, real estate acquisition processes, previous drainage studies, etc. During the feasibility analysis USACE staff created updated hydrologic and hydraulic models of the Cooper Creek watershed. The USACE also evaluated a wide variety of potential actions to reduce flood damage near the creek; including additional regional detention, channel improvements, bridge and culvert modifications, elevating at-risk structures, and structure buyouts.

The feasibility analysis was concluded in February 2025. The USACE was unable to find potential projects that achieved a positive cost-benefit ratio score and recommended that no Federal action be taken. The USACE completed a closeout report that included the updated hydrologic and hydraulic models developed by the USACE that were provided to City staff for future use. It is important to note that many of the alternatives considered would have a positive effect on reducing flood risk within the Cooper Creek watershed, and while the alternatives did not achieve a positive cost-benefit ratio using the USACE methodology they may still inform future capital

improvements in the area. Upon close-out of the feasibility analysis $118,030.43 in unspent funds were returned to the City.

ATTACHMENTS:

CAP Section 205 Fact Sheet
ID 24-243 ordinance
Cooper Creek CAP 205 Closeout Report

STAFF CONTACT:

Mike Linder
Senior Engineer – Engineering
Mike.Linder@cityofdenton.com
(940)-349-8942

PARTICIPATING DEPARTMENTS: Engineering

STAFF TIME TO COMPLETE REPORT: 6 hours

Section 205 – Small Flood Risk Management Projects

U.S. ARMY CORPS OF ENGINEERS

Scope and Authority

- The U.S. Army Corps of Engineers (USACE) can partner with a non-federal sponsor (sponsor) to plan and construct small flood damage reduction projects that have not previously been specifically authorized by Congress and are not part of a larger project.
- Projects may be structural (e.g., levees, flood walls, diversion channels, pumping plants and bridge modifications) or non-structural (e.g., floodproofing, relocation of structures and flood warning systems).
- Authority is provided by Section 205 of the Flood Control Act of 1948 (P.L. 80-858), as amended, also referred to as Section 205 under the Continuing Authorities Program.

Project Development Process

- **Feasibility Study** - Upon receipt of a written Letter of Intent (LOI) from a potential sponsor and when funding is available, USACE initiates a Federal Interest Determination, at federal expense, to determine if a potential project meets program requirements and federal participation is justified. If a federal interest is verified, a feasibility study will be advanced to identify and comprehensively evaluate alternatives and recommend a plan for implementation. If the feasibility study cost exceeds $100,000, USACE and sponsor sign a Feasibility Cost Share Agreement and a project management plan that describes the study cost share arrangement, study scope, schedule, and study cost estimate (See Project Costs).
- **Design and Construction** - A project is approved for construction if the detailed feasibility study determines it is technically feasible, environmentally acceptable, and cost effective. Before engineering design and construction can begin, USACE and sponsor negotiate and sign a Project Partnership Agreement that describes the cost share arrangement and operations and maintenance responsibilities (See Project Costs).

Project Costs

The maximum federal expenditure per project is $15 million, including feasibility study, design and construction costs.

Feasibility Study	• The study is initiated with up to $100,000 in federal funds. • Costs exceeding $100,000 are cost shared 50 percent federal and 50 percent sponsor. • Sponsor's cost share may include cash, work-in-kind or a combination of both.
Design and Construction	• Most projects are cost-shared 65 percent federal and 35 percent sponsor but sponsor cost could increase to 50% with high costs for lands, easements, rights-of-way, relocations, and dredged material disposal areas (LERRDs). • Sponsor must provide all LERRDs needed for project construction and maintenance. • At least 5 percent of the cost share requirement must be provided in cash.
Operation and Maintenance	• Sponsor is responsible for all project operation and maintenance costs when the project is completed.

How to Request a Project

A template LOI to request a study under the Continuing Authorities Program is available on the USACE Planning web site.

ORDINANCE NO. 24-243

AN ORDINANCE OF THE CITY OF DENTON APPROVING AND AUTHORIZING THE CITY MANAGER TO EXECUTE AN AGREEMENT WITH THE DEPARTMENT OF THE ARMY FORT WORTH DISTRICT UNDER THE CONTINUING AUTHORITIES PROGRAM (CAP) SECTION 205 TO STUDY, DETERMINE CAUSE, AND FIND A SOLUTION TO THE FLOODING OF COOPER CREEK AND THE ADJACENT AREAS; AND DECLARING AN EFFECTIVE DATE.

WHEREAS, the CAP supports smaller community projects and allows the Fort Worth District to plan, design, and construct projects of limited size, cost, scope, and complexity; and

WHEREAS, the CAP is ideal for funding projects for flood risk management, ecosystem restoration, erosion control, and streambank protection; and

WHEREAS, Cooper Creek, located in the Elm Fork Trinity River watershed, is experiencing accelerated erosion, loss of riparian trees, and damage to private property during large rain events; and

WHEREAS, the City of Denton submitted a Letter of Request on June 29, 2023, to the US Army Corps of Engineers (USACE) providing notice of the issue and requesting assistance; and

WHEREAS, the USACE has conducted a site investigation and determined federal interest in the project; and

WHEREAS, the US Department of the Army (Government) has projected the cost of the study to be $600,000, the grant provides funding for the first $100,000, and requires the Non-Federal Sponsor to cost share at 50 percent (50%) of the remaining costs estimated at $250,000;

WHEREAS, any additional funds above the estimated amount must be remitted to the Government after final accounting, and any excess funds shall be refunded subject to the availability of funds;

NOW THEREFORE,

THE COUNCIL OF THE CITY OF DENTON HEREBY ORDAINS:

SECTION 1. The recitals are hereby incorporated and made part of this ordinance for all purposes.

SECTION 2. The City Manager or their designee is hereby authorized to execute the agreement with the Department of the Army attached hereto as Exhibit "A" authorizing the City, through the Environmental Services and Sustainability Department, to spend its share of the cost of the study in accordance with the authorized purposes cited in the agreement.

SECTION 3. This ordinance shall become effective immediately upon its passage and approval.

The motion to approve this ordinance was made by Gerard Hudspeth and seconded by Brandon Chase McGee, the ordinance was passed and approved by the following vote [7 - 0]:

	Aye	Nay	Abstain	Absent
Mayor Gerard Hudspeth:	✓			
Vicki Byrd, District 1:	✓			
Brian Beck, District 2:	✓			
Paul Meltzer, District 3:	✓			
Joe Holland, District 4:	✓			
Brandon Chase McGee, At Large Place 5:	✓			
Chris Watts, At Large Place 6:	✓			

PASSED AND APPROVED this the 5th day of March, 2024.

GERARD HUDSPETH, MAYOR

ATTEST:
JESUS SALAZAR, CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

BY: Susan Keller

Digitally signed by Susan Keller
DN: dc=com, dc=cityofdenton, dc=codad, ou=Department Users and Groups, ou=General Government, ou=Legal, cn=Susan Keller, email=Susan.Keller@cityofdenton.com
Date: 2024.02.29 11:52:34 -06'00'

CITY OF DENTON
DENTON, TEXAS

AGREEMENT
BETWEEN
THE DEPARTMENT OF THE ARMY
AND
CITY OF DENTON, TEXAS
FOR THE
COOPER CREEK, CONTINUING AUTHORITIES PROGRAM SECTION 205

THIS AGREEMENT is entered into this ____ day of _____, _____, by and between the Department of the Army (hereinafter the "Government"), represented by the District Commander for Fort Worth District (hereinafter the "District Commander") and the City of Denton, Texas (hereinafter the "Non-Federal Sponsor"), represented by the City Manager.

WITNESSETH, THAT:

WHEREAS, Section 205 of the Flood Control Act of 1948, as amended (33 U.S.C. 701s)] authorizes the study of Cooper Creek located within the city of Denton, Texas to address flooding issues;

WHEREAS, Section 105(a) of the Water Resources Development Act (WRDA) of 1986, as amended (33 U.S.C. 2215(a)), specifies the cost-sharing requirements; and

WHEREAS, the Government and the Non-Federal Sponsor have the full authority and capability to perform in accordance with the terms of this Agreement.

NOW, THEREFORE, the parties agree as follows:

ARTICLE I - DEFINITIONS

A. The term "Study" means the activities and tasks required to identify and evaluate alternatives and the preparation of a Detailed Project Report that, as appropriate, recommends a coordinated and implementable solution for the flooding issues on Cooper Creek and the adjacent areas in the City of Denton, Denton County, Texas.

B. The term "study costs" means all costs incurred by the Government and Non-Federal Sponsor after the effective date of this Agreement that are directly related to performance of the Study and cost shared in accordance with the terms of this Agreement. The term includes the Government's costs for preparing the project management plan ("PMP"); for plan formulation and evaluation, including costs for economic, engineering, real estate, and environmental analyses; for preparation of a floodplain management plan if undertaken as part of the Study; for preparing and processing the Detailed Project Report; for supervision and administration; for Agency Technical Review and other review processes required by the Government; and for response to any required Independent External Peer Review; and the Non-Federal Sponsor's creditable costs for in-kind contributions, if any. The term does not include any costs for dispute

resolution; participation by the Government and Non-Federal Sponsor in the Study Coordination Team to discuss significant issues and actions; audits; an Independent External Peer Review panel, if required; or negotiating this Agreement. The term also does not include the first $100,000 of costs for the Study incurred by the Government, whether before or after execution of this Agreement.

C. The term "PMP" means the project management plan, and any modifications thereto, developed in consultation with the Non-Federal Sponsor, that specifies the scope, cost, and schedule for Study activities and tasks, including the Non-Federal Sponsor's in-kind contributions, and that guides the performance of the Study.

D. The term "in-kind contributions" means those planning activities (including data collection and other services) that are integral to the Study and would otherwise have been undertaken by the Government for the Study and that are identified in the PMP and performed or provided by the Non-Federal Sponsor after the effective date of this Agreement and in accordance with the PMP.

E. The term "maximum Federal study cost" means the $1,500,000 Federal cost limit for the Study, unless the Government has approved a higher amount, and includes the first $100,000 of costs for the Study incurred by the Government.

F. The term "fiscal year" means one year beginning on October 1st and ending on September 30th of the following year.

ARTICLE II - OBLIGATIONS OF THE PARTIES

A. In accordance with Federal laws, regulations, and policies, the Government shall conduct the Study using funds appropriated by the Congress and funds provided by the Non-Federal Sponsor. In carrying out its obligations under this Agreement, the Non-Federal Sponsor shall comply with all the requirements of applicable Federal laws and implementing regulations, including but not limited to, if applicable, Section 601 of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto; the Age Discrimination Act of 1975 (42 U.S.C. 6102); and the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Army Regulation 600-7 issued pursuant thereto.

B. The Non-Federal Sponsor shall contribute 50 percent of study costs in accordance with the provisions of this paragraph and provide required funds in accordance with Article III.

1. After considering the estimated amount of credit for in-kind contributions, if any, that will be afforded in accordance with paragraph C. of this Article and the first $100,000 of the costs incurred by the Government that are excluded from study costs, the Government shall provide the Non-Federal Sponsor with a written estimate of the amount of funds required from the Non-Federal Sponsor to meet its share of study costs for the remainder of the initial fiscal year of the Study. No later than 15 calendar days after such notification, the Non-Federal

Sponsor shall provide the full amount of such funds to the Government in accordance with Article III.C.

2. No later than August 1st prior to each subsequent fiscal year of the Study, the Government shall provide the Non-Federal Sponsor with a written estimate of the amount of funds required from the Non-Federal Sponsor during that fiscal year to meet its cost share. No later than September 1st prior to that fiscal year, the Non-Federal Sponsor shall provide the full amount of such required funds to the Government in accordance with Article III.C.

C. The Government shall include in study costs and credit towards the Non-Federal Sponsor's share of such costs, the costs, documented to the satisfaction of the Government, that the Non-Federal Sponsor incurs in providing or performing in-kind contributions, including associated supervision and administration, after the effective date of this Agreement. Such costs shall be subject to audit in accordance with Article VI to determine reasonableness, allocability, and allowability, and crediting shall be in accordance with the following procedures, requirements, and limitations:

1. As in-kind contributions are completed and no later than 60 calendar days after such completion, the Non-Federal Sponsor shall provide the Government appropriate documentation, including invoices and certification of specific payments to contractors, suppliers, and the Non-Federal Sponsor's employees. Failure to provide such documentation in a timely manner may result in denial of credit. The amount of credit afforded for in-kind contributions shall not exceed the Non-Federal Sponsor's share of study costs.

2. No credit shall be afforded for interest charges, or any adjustment to reflect changes in price levels between the time the in-kind contributions are completed, and credit is afforded; for the value of in-kind contributions obtained at no cost to the Non-Federal Sponsor; for any items provided or performed prior to completion of the PMP; or for costs that exceed the Government's estimate of the cost for such item.

D. To the extent practicable and in accordance with Federal laws, regulations, and policies, the Government shall afford the Non-Federal Sponsor the opportunity to review and comment on contract solicitations prior to the Government's issuance of such solicitations; proposed contract modifications, including change orders; and contract claims prior to resolution thereof. Ultimately, the contents of solicitations, award of contracts, execution of contract modifications, and resolution of contract claims shall be exclusively within the control of the Government.

E. The Non-Federal Sponsor shall not use Federal program funds to meet any of its obligations under this Agreement unless the Federal agency providing the funds verifies in writing that the funds are authorized to be used for the Study. Federal program funds are those funds provided by a Federal agency, plus any non-Federal contribution required as a matching share therefor.

F. Except as provided in paragraph C. of this Article, the Non-Federal Sponsor shall not be entitled to any credit or reimbursement for costs it incurs in performing its responsibilities under this Agreement.

G. If Independent External Peer Review (IEPR) is required for the Study, the Government shall conduct such review in accordance with Federal laws, regulations, and policies. The Government's costs for an IEPR panel shall not be included in study costs or the maximum Federal study cost.

H. In addition to the ongoing, regular discussions between the parties regarding Study delivery, the Government and the Non-Federal Sponsor may establish a Study Coordination Team to discuss significant issues or actions. The Government's costs for participation on the Study Coordination Team shall not be included in the study costs but shall be included in calculating the maximum Federal study cost. The Non-Federal Sponsor's costs for participation on the Study Coordination Team shall not be included in study costs and shall be paid solely by the Non-Federal Sponsor without reimbursement or credit by the Government.

ARTICLE III - PROVISION OF NON-FEDERAL COST SHARE

A. As of the effective date of this Agreement, study costs are projected to be $600,000, with the Government's share of such costs projected to be $350,000 and the Non-Federal Sponsor's share of such costs projected to be $250,000, which includes creditable in-kind contributions projected to be $0, and the amount of funds required to meet its cost share projected to be $250,000. These amounts are estimates only that are subject to adjustment by the Government and are not to be construed as the total financial responsibilities of the Government and the Non-Federal Sponsor.

B. The Government shall provide the Non-Federal Sponsor with monthly reports setting forth the estimated study costs and the Government's and Non-Federal Sponsor's estimated shares of such costs; costs incurred by the Government, using both Federal and Non-Federal Sponsor funds, to date; the amount of funds provided by the Non-Federal Sponsor to date; the estimated amount of any creditable in-kind contributions; and the estimated remaining cost of the Study.

C. The Non-Federal Sponsor shall provide to the Government required funds by delivering a check payable to "FAO, USAED, Fort Worth District (M2) to the District Commander, or verifying to the satisfaction of the Government that the Non-Federal Sponsor has deposited such required funds in an escrow or other account acceptable to the Government, with interest accruing to the Non-Federal Sponsor, or by providing an Electronic Funds Transfer of such required funds in accordance with procedures established by the Government.

D. The Government shall draw from the funds provided by the Non-Federal Sponsor to cover the non-Federal share of study costs as those costs are incurred. If the Government determines at any time that additional funds are needed from the Non-Federal Sponsor to cover the Non-Federal Sponsor's required share of study costs, the Government shall provide the Non-

Federal Sponsor with written notice of the amount of additional funds required. Within 60 calendar days of such notice, the Non-Federal Sponsor shall provide the Government with the full amount of such additional funds.

E. Upon completion of the Study and resolution of all relevant claims and appeals, the Government shall conduct a final accounting and furnish the Non-Federal Sponsor with the written results of such final accounting. Should the final accounting determine that additional funds are required from the Non-Federal Sponsor, the Non-Federal Sponsor, within 60 calendar days of written notice from the Government, shall provide the Government with the full amount of such additional funds by delivering a check payable to "FAO, USAED, Fort Worth District (M2) to the District Commander, or by providing an Electronic Funds Transfer of such required funds in accordance with procedures established by the Government. Should the final accounting determine that the Non-Federal Sponsor has provided funds in excess of its required amount, the Government shall refund the excess amount, subject to the availability of funds. Such final accounting does not limit the Non-Federal Sponsor's responsibility to pay its share of study costs, including contract claims or any other liability that may become known after the final accounting.

ARTICLE IV - TERMINATION OR SUSPENSION

A. Upon 30 calendar days written notice to the other party, either party may elect at any time, without penalty, to suspend or terminate future performance of the Study. Furthermore, unless an extension is approved by the Assistant Secretary of the Army (Civil Works), the Study may be terminated if a Detailed Project Report is not completed for the Study within 3 years after the effective date of this Agreement.

B. In the event of termination, the parties shall conclude their activities relating to the Study. To provide for this eventuality, the Government may reserve a percentage of available funds as a contingency to pay the costs of termination, including any costs of resolution of contract claims, and resolution of contract modifications.

C. Any suspension or termination shall not relieve the parties of liability for any obligation incurred. Any delinquent payment owed by the Non-Federal Sponsor pursuant to this Agreement shall be charged interest at a rate, to be determined by the Secretary of the Treasury, equal to 150 per centum of the average bond equivalent rate of the 13 week Treasury bills auctioned immediately prior to the date on which such payment became delinquent, or auctioned immediately prior to the beginning of each additional 3 month period if the period of delinquency exceeds 3 months.

ARTICLE V - DISPUTE RESOLUTION

As a condition precedent to a party bringing any suit for breach of this Agreement, that party must first notify the other party in writing of the nature of the purported breach and seek in good faith to resolve the dispute through negotiation. If the parties cannot resolve the dispute through negotiation, they may agree to a mutually acceptable method of non-binding alternative

dispute resolution with a qualified third party acceptable to the parties. Each party shall pay an equal share of any costs for the services provided by such a third party as such costs are incurred. The existence of a dispute shall not excuse the parties from performance pursuant to this Agreement.

ARTICLE VI - MAINTENANCE OF RECORDS AND AUDIT

A. The parties shall develop procedures for the maintenance by the Non-Federal Sponsor of books, records, documents, or other evidence pertaining to costs and expenses for a minimum of three years after the final accounting. The Non-Federal Sponsor shall assure that such materials are reasonably available for examination, audit, or reproduction by the Government.

B. The Government may conduct, or arrange for the conduct of, audits of the Study. Government audits shall be conducted in accordance with applicable Government cost principles and regulations. The Government's costs of audits for the Study shall not be included in study costs but shall be included in calculating the maximum Federal study cost.

C. To the extent permitted under applicable Federal laws and regulations, the Government shall allow the Non-Federal Sponsor to inspect books, records, documents, or other evidence pertaining to costs and expenses maintained by the Government, or at the Non-Federal Sponsor's request, provide to the Non-Federal Sponsor or independent auditors any such information necessary to enable an audit of the Non-Federal Sponsor's activities under this Agreement. The Non-Federal Sponsor shall pay the costs of non-Federal audits without reimbursement or credit by the Government.

ARTICLE VII - RELATIONSHIP OF PARTIES

In the exercise of their respective rights and obligations under this Agreement, the Government, and the Non-Federal Sponsor each act in an independent capacity, and neither is to be considered the officer, agent, or employee of the other. Neither party shall provide, without the consent of the other party, any contractor with a release that waives or purports to waive any rights a party may have to seek relief or redress against that contractor.

ARTICLE VIII - NOTICES

A. Any notice, request, demand, or other communication required or permitted to be given under this Agreement shall be deemed to have been duly given if in writing and delivered personally or mailed by registered or certified mail, with return receipt, as follows:

If to the Non-Federal Sponsor:
City Manager
City of Denton
215 E. McKinney St,
Denton, TX 76201

If to the Government:

District Commander
U.S. Army Corps of Engineers, Fort Worth District
819 Taylor Street
Fort Worth, TX 76102

B. A party may change the recipient or address to which such communications are to be directed by giving written notice to the other party in the manner provided in this Article.

ARTICLE IX - CONFIDENTIALITY

To the extent permitted by the laws governing each party, the parties agree to maintain the confidentiality of exchanged information when requested to do so by the providing party.

ARTICLE X - THIRD PARTY RIGHTS, BENEFITS, OR LIABILITIES

Nothing in this Agreement is intended, nor may be construed, to create any rights, confer any benefits, or relieve any liability, of any kind whatsoever in any third person not a party to this Agreement.

ARTICLE XI - OBLIGATIONS OF FUTURE APPROPRIATIONS

The Non-Federal Sponsor intends to fulfill fully its obligations under this Agreement. Nothing herein shall constitute, nor be deemed to constitute, an obligation of future appropriations by the City of Denton, where creating such an obligation would be inconsistent with constitutional or statutory limitation on committing future appropriations. If the Non-Federal Sponsor is unable to, or does not, fulfill its obligations under this Agreement, the Government may exercise any legal rights it has to protect the Government's interests.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement, which shall become effective upon the date it is signed by the District Commander.

DEPARTMENT OF THE ARMY

BY: _____
Calvin A. Kroeger
Colonel, U.S. Army
Commanding

CITY OF DENTON

BY: _____
Sara Hensley
City Manager

DATE: _____ DATE: _____

AGREEMENT
BETWEEN
THE DEPARTMENT OF THE ARMY
AND
CITY OF DENTON, TEXAS
FOR THE
COOPER CREEK, CONTINUING AUTHORITIES PROGRAM SECTION 205

THIS AGREEMENT is entered into this 5th day of April, 2024, by and between the Department of the Army (hereinafter the "Government"), represented by the District Commander for Fort Worth District (hereinafter the "District Commander") and the City of Denton, Texas (hereinafter the "Non-Federal Sponsor"), represented by the City Manager.

WITNESSETH, THAT:

WHEREAS, Section 205 of the Flood Control Act of 1948, as amended (33 U.S.C. 701s)] authorizes the study of Cooper Creek located within the city of Denton, Texas to address flooding issues;

WHEREAS, Section 105(a) of the Water Resources Development Act (WRDA) of 1986, as amended (33 U.S.C. 2215(a)), specifies the cost-sharing requirements; and

WHEREAS, the Government and the Non-Federal Sponsor have the full authority and capability to perform in accordance with the terms of this Agreement.

NOW, THEREFORE, the parties agree as follows:

ARTICLE I - DEFINITIONS

A. The term "Study" means the activities and tasks required to identify and evaluate alternatives and the preparation of a Detailed Project Report that, as appropriate, recommends a coordinated and implementable solution for the flooding issues on Cooper Creek and the adjacent areas in the City of Denton, Denton County, Texas.

B. The term "study costs" means all costs incurred by the Government and Non-Federal Sponsor after the effective date of this Agreement that are directly related to performance of the Study and cost shared in accordance with the terms of this Agreement. The term includes the Government's costs for preparing the project management plan ("PMP"); for plan formulation and evaluation, including costs for economic, engineering, real estate, and environmental analyses; for preparation of a floodplain management plan if undertaken as part of the Study; for preparing and processing the Detailed Project Report; for supervision and administration; for Agency Technical Review and other review processes required by the Government; and for response to any required Independent External Peer Review; and the Non-Federal Sponsor's creditable costs for in-kind contributions, if any. The term does not include any costs for dispute

resolution; participation by the Government and Non-Federal Sponsor in the Study Coordination Team to discuss significant issues and actions; audits; an Independent External Peer Review panel, if required; or negotiating this Agreement. The term also does not include the first $100,000 of costs for the Study incurred by the Government, whether before or after execution of this Agreement.

C. The term "PMP" means the project management plan, and any modifications thereto, developed in consultation with the Non-Federal Sponsor, that specifies the scope, cost, and schedule for Study activities and tasks, including the Non-Federal Sponsor's in-kind contributions, and that guides the performance of the Study.

D. The term "in-kind contributions" means those planning activities (including data collection and other services) that are integral to the Study and would otherwise have been undertaken by the Government for the Study and that are identified in the PMP and performed or provided by the Non-Federal Sponsor after the effective date of this Agreement and in accordance with the PMP.

E. The term "maximum Federal study cost" means the $1,500,000 Federal cost limit for the Study, unless the Government has approved a higher amount, and includes the first $100,000 of costs for the Study incurred by the Government.

F. The term "fiscal year" means one year beginning on October 1st and ending on September 30th of the following year.

ARTICLE II - OBLIGATIONS OF THE PARTIES

A. In accordance with Federal laws, regulations, and policies, the Government shall conduct the Study using funds appropriated by the Congress and funds provided by the Non-Federal Sponsor. In carrying out its obligations under this Agreement, the Non-Federal Sponsor shall comply with all the requirements of applicable Federal laws and implementing regulations, including but not limited to, if applicable, Section 601 of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto; the Age Discrimination Act of 1975 (42 U.S.C. 6102); and the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Army Regulation 600-7 issued pursuant thereto.

B. The Non-Federal Sponsor shall contribute 50 percent of study costs in accordance with the provisions of this paragraph and provide required funds in accordance with Article III.

1. After considering the estimated amount of credit for in-kind contributions, if any, that will be afforded in accordance with paragraph C. of this Article and the first $100,000 of the costs incurred by the Government that are excluded from study costs, the Government shall provide the Non-Federal Sponsor with a written estimate of the amount of funds required from the Non-Federal Sponsor to meet its share of study costs for the remainder of the initial fiscal year of the Study. No later than 15 calendar days after such notification, the Non-Federal

Sponsor shall provide the full amount of such funds to the Government in accordance with Article III.C.

2. No later than August 1st prior to each subsequent fiscal year of the Study, the Government shall provide the Non-Federal Sponsor with a written estimate of the amount of funds required from the Non-Federal Sponsor during that fiscal year to meet its cost share. No later than September 1st prior to that fiscal year, the Non-Federal Sponsor shall provide the full amount of such required funds to the Government in accordance with Article III.C.

C. The Government shall include in study costs and credit towards the Non-Federal Sponsor's share of such costs, the costs, documented to the satisfaction of the Government, that the Non-Federal Sponsor incurs in providing or performing in-kind contributions, including associated supervision and administration, after the effective date of this Agreement. Such costs shall be subject to audit in accordance with Article VI to determine reasonableness, allocability, and allowability, and crediting shall be in accordance with the following procedures, requirements, and limitations:

1. As in-kind contributions are completed and no later than 60 calendar days after such completion, the Non-Federal Sponsor shall provide the Government appropriate documentation, including invoices and certification of specific payments to contractors, suppliers, and the Non-Federal Sponsor's employees. Failure to provide such documentation in a timely manner may result in denial of credit. The amount of credit afforded for in-kind contributions shall not exceed the Non-Federal Sponsor's share of study costs.

2. No credit shall be afforded for interest charges, or any adjustment to reflect changes in price levels between the time the in-kind contributions are completed, and credit is afforded; for the value of in-kind contributions obtained at no cost to the Non-Federal Sponsor; for any items provided or performed prior to completion of the PMP; or for costs that exceed the Government's estimate of the cost for such item.

D. To the extent practicable and in accordance with Federal laws, regulations, and policies, the Government shall afford the Non-Federal Sponsor the opportunity to review and comment on contract solicitations prior to the Government's issuance of such solicitations; proposed contract modifications, including change orders; and contract claims prior to resolution thereof. Ultimately, the contents of solicitations, award of contracts, execution of contract modifications, and resolution of contract claims shall be exclusively within the control of the Government.

E. The Non-Federal Sponsor shall not use Federal program funds to meet any of its obligations under this Agreement unless the Federal agency providing the funds verifies in writing that the funds are authorized to be used for the Study. Federal program funds are those funds provided by a Federal agency, plus any non-Federal contribution required as a matching share therefor.

F. Except as provided in paragraph C. of this Article, the Non-Federal Sponsor shall not be entitled to any credit or reimbursement for costs it incurs in performing its responsibilities under this Agreement.

G. If Independent External Peer Review (IEPR) is required for the Study, the Government shall conduct such review in accordance with Federal laws, regulations, and policies. The Government's costs for an IEPR panel shall not be included in study costs or the maximum Federal study cost.

H. In addition to the ongoing, regular discussions between the parties regarding Study delivery, the Government and the Non-Federal Sponsor may establish a Study Coordination Team to discuss significant issues or actions. The Government's costs for participation on the Study Coordination Team shall not be included in the study costs but shall be included in calculating the maximum Federal study cost. The Non-Federal Sponsor's costs for participation on the Study Coordination Team shall not be included in study costs and shall be paid solely by the Non-Federal Sponsor without reimbursement or credit by the Government.

ARTICLE III - PROVISION OF NON-FEDERAL COST SHARE

A. As of the effective date of this Agreement, study costs are projected to be $600,000, with the Government's share of such costs projected to be $350,000 and the Non-Federal Sponsor's share of such costs projected to be $250,000, which includes creditable in-kind contributions projected to be $0, and the amount of funds required to meet its cost share projected to be $250,000. These amounts are estimates only that are subject to adjustment by the Government and are not to be construed as the total financial responsibilities of the Government and the Non-Federal Sponsor.

B. The Government shall provide the Non-Federal Sponsor with monthly reports setting forth the estimated study costs and the Government's and Non-Federal Sponsor's estimated shares of such costs; costs incurred by the Government, using both Federal and Non-Federal Sponsor funds, to date; the amount of funds provided by the Non-Federal Sponsor to date; the estimated amount of any creditable in-kind contributions; and the estimated remaining cost of the Study.

C. The Non-Federal Sponsor shall provide to the Government required funds by delivering a check payable to "FAO, USAED, Fort Worth District (M2) to the District Commander, or verifying to the satisfaction of the Government that the Non-Federal Sponsor has deposited such required funds in an escrow or other account acceptable to the Government, with interest accruing to the Non-Federal Sponsor, or by providing an Electronic Funds Transfer of such required funds in accordance with procedures established by the Government.

D. The Government shall draw from the funds provided by the Non-Federal Sponsor to cover the non-Federal share of study costs as those costs are incurred. If the Government determines at any time that additional funds are needed from the Non-Federal Sponsor to cover the Non-Federal Sponsor's required share of study costs, the Government shall provide the Non-

Federal Sponsor with written notice of the amount of additional funds required. Within 60 calendar days of such notice, the Non-Federal Sponsor shall provide the Government with the full amount of such additional funds.

E. Upon completion of the Study and resolution of all relevant claims and appeals, the Government shall conduct a final accounting and furnish the Non-Federal Sponsor with the written results of such final accounting. Should the final accounting determine that additional funds are required from the Non-Federal Sponsor, the Non-Federal Sponsor, within 60 calendar days of written notice from the Government, shall provide the Government with the full amount of such additional funds by delivering a check payable to "FAO, USAED, Fort Worth District (M2) to the District Commander, or by providing an Electronic Funds Transfer of such required funds in accordance with procedures established by the Government. Should the final accounting determine that the Non-Federal Sponsor has provided funds in excess of its required amount, the Government shall refund the excess amount, subject to the availability of funds. Such final accounting does not limit the Non-Federal Sponsor's responsibility to pay its share of study costs, including contract claims or any other liability that may become known after the final accounting.

ARTICLE IV - TERMINATION OR SUSPENSION

A. Upon 30 calendar days written notice to the other party, either party may elect at any time, without penalty, to suspend or terminate future performance of the Study. Furthermore, unless an extension is approved by the Assistant Secretary of the Army (Civil Works), the Study may be terminated if a Detailed Project Report is not completed for the Study within 3 years after the effective date of this Agreement.

B. In the event of termination, the parties shall conclude their activities relating to the Study. To provide for this eventuality, the Government may reserve a percentage of available funds as a contingency to pay the costs of termination, including any costs of resolution of contract claims, and resolution of contract modifications.

C. Any suspension or termination shall not relieve the parties of liability for any obligation incurred. Any delinquent payment owed by the Non-Federal Sponsor pursuant to this Agreement shall be charged interest at a rate, to be determined by the Secretary of the Treasury, equal to 150 per centum of the average bond equivalent rate of the 13 week Treasury bills auctioned immediately prior to the date on which such payment became delinquent, or auctioned immediately prior to the beginning of each additional 3 month period if the period of delinquency exceeds 3 months.

ARTICLE V - DISPUTE RESOLUTION

As a condition precedent to a party bringing any suit for breach of this Agreement, that party must first notify the other party in writing of the nature of the purported breach and seek in good faith to resolve the dispute through negotiation. If the parties cannot resolve the dispute through negotiation, they may agree to a mutually acceptable method of non-binding alternative

dispute resolution with a qualified third party acceptable to the parties. Each party shall pay an equal share of any costs for the services provided by such a third party as such costs are incurred. The existence of a dispute shall not excuse the parties from performance pursuant to this Agreement.

ARTICLE VI - MAINTENANCE OF RECORDS AND AUDIT

A. The parties shall develop procedures for the maintenance by the Non-Federal Sponsor of books, records, documents, or other evidence pertaining to costs and expenses for a minimum of three years after the final accounting. The Non-Federal Sponsor shall assure that such materials are reasonably available for examination, audit, or reproduction by the Government.

B. The Government may conduct, or arrange for the conduct of, audits of the Study. Government audits shall be conducted in accordance with applicable Government cost principles and regulations. The Government's costs of audits for the Study shall not be included in study costs but shall be included in calculating the maximum Federal study cost.

C. To the extent permitted under applicable Federal laws and regulations, the Government shall allow the Non-Federal Sponsor to inspect books, records, documents, or other evidence pertaining to costs and expenses maintained by the Government, or at the Non-Federal Sponsor's request, provide to the Non-Federal Sponsor or independent auditors any such information necessary to enable an audit of the Non-Federal Sponsor's activities under this Agreement. The Non-Federal Sponsor shall pay the costs of non-Federal audits without reimbursement or credit by the Government.

ARTICLE VII - RELATIONSHIP OF PARTIES

In the exercise of their respective rights and obligations under this Agreement, the Government, and the Non-Federal Sponsor each act in an independent capacity, and neither is to be considered the officer, agent, or employee of the other. Neither party shall provide, without the consent of the other party, any contractor with a release that waives or purports to waive any rights a party may have to seek relief or redress against that contractor.

ARTICLE VIII - NOTICES

A. Any notice, request, demand, or other communication required or permitted to be given under this Agreement shall be deemed to have been duly given if in writing and delivered personally or mailed by registered or certified mail, with return receipt, as follows:

If to the Non-Federal Sponsor:
City Manager
City of Denton
215 E. McKinney St,
Denton, TX 76201

If to the Government:

District Commander
U.S. Army Corps of Engineers, Fort Worth District
819 Taylor Street
Fort Worth, TX 76102

B. A party may change the recipient or address to which such communications are to be directed by giving written notice to the other party in the manner provided in this Article.

ARTICLE IX - CONFIDENTIALITY

To the extent permitted by the laws governing each party, the parties agree to maintain the confidentiality of exchanged information when requested to do so by the providing party.

ARTICLE X - THIRD PARTY RIGHTS, BENEFITS, OR LIABILITIES

Nothing in this Agreement is intended, nor may be construed, to create any rights, confer any benefits, or relieve any liability, of any kind whatsoever in any third person not a party to this Agreement.

ARTICLE XI - OBLIGATIONS OF FUTURE APPROPRIATIONS

The Non-Federal Sponsor intends to fulfill fully its obligations under this Agreement. Nothing herein shall constitute, nor be deemed to constitute, an obligation of future appropriations by the City of Denton, where creating such an obligation would be inconsistent with constitutional or statutory limitation on committing future appropriations. If the Non-Federal Sponsor is unable to, or does not, fulfill its obligations under this Agreement, the Government may exercise any legal rights it has to protect the Government's interests.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement, which shall become effective upon the date it is signed by the District Commander.

DEPARTMENT OF THE ARMY

BY: _____
Calvin A. Kroeger
Colonel, U.S. Army
Commanding

CITY OF DENTON

BY: _____
Sara Hensley
City Manager

For Sara Hensley

DATE: 05 APRIL 2024 DATE: MARCH 26, 2024

Closeout Report

CAP – Cooper Creek, Denton, Texas, Section 205

Fort Worth District, Southwestern Division

February 2025

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Closeout Report
CAP – Cooper Creek, Denton, Texas, Section 205
Fort Worth District, Southwestern Division

February 2025

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Executive Summary

This report examines the need for construction of flood risk management measures along Cooper Creek in Denton, Texas and determines the feasibility of Federal participation in the potential improvements.

Cooper Creek is located In the northern part of the City of Denton, Texas. The creek flows in a southeasterly direction though the city and terminates at Lewisville Lake. The creek is generally small but well defined, mostly unimproved channel with several tributaries. The main channel has an average depth of 6 feet, a top width of 50 feet and a slope of 25 feet per mile. The creek is normally dry with flow occurring during periods of heavy rainfall. There are several culvert crossings that have limited capacity and cause backwater conditions within the stream channel. The 100-year floodplain generally extends beyond the stream. Existing detention ponds were constructed within Cooper Creek watershed to reduce flood damages along the creek. There is some channel erosion along Cooper Creek due to high velocities in the channel.

This study evaluated a number of alternatives based on economics, engineering, environmental, and other factors. No Alternative was identified that produced positive net National Economic Development benefits. Comprehensive benefits were analyzed, however, the lack of benefits across all categories led the team to recommend no Federal action. The non-Federal partner (City of Denton) supports the recommendation.

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1. INTRODUCTION

1.1. Authority

The feasibility study is being conducted under authority granted by Section 205 of the Flood Control Act of 1948 (Public Law 80-858), as amended, as administered under the U.S Army Corps of Engineers Continuing Authorities Program (CAP).

1.2. Scope of the Study

The study examines the feasibility and environmental effects of implementing flood risk management measures along Cooper Creek in Denton, Texas. The City of Denton is located in central Denton County, which is in the northcentral portion of the state. Latitude: 33°13'45" N by Longitude: 97°07'25" W. The study area is shown in Figure 1 with the project area shown below in Figure 2. The non-Federal partner for the feasibility study is the City of Denton. Denton, Texas is located in Texas Congressional District 13 which is represented by Congressman Ronny Jackson and Senators John Cornyn and Ted Cruz.

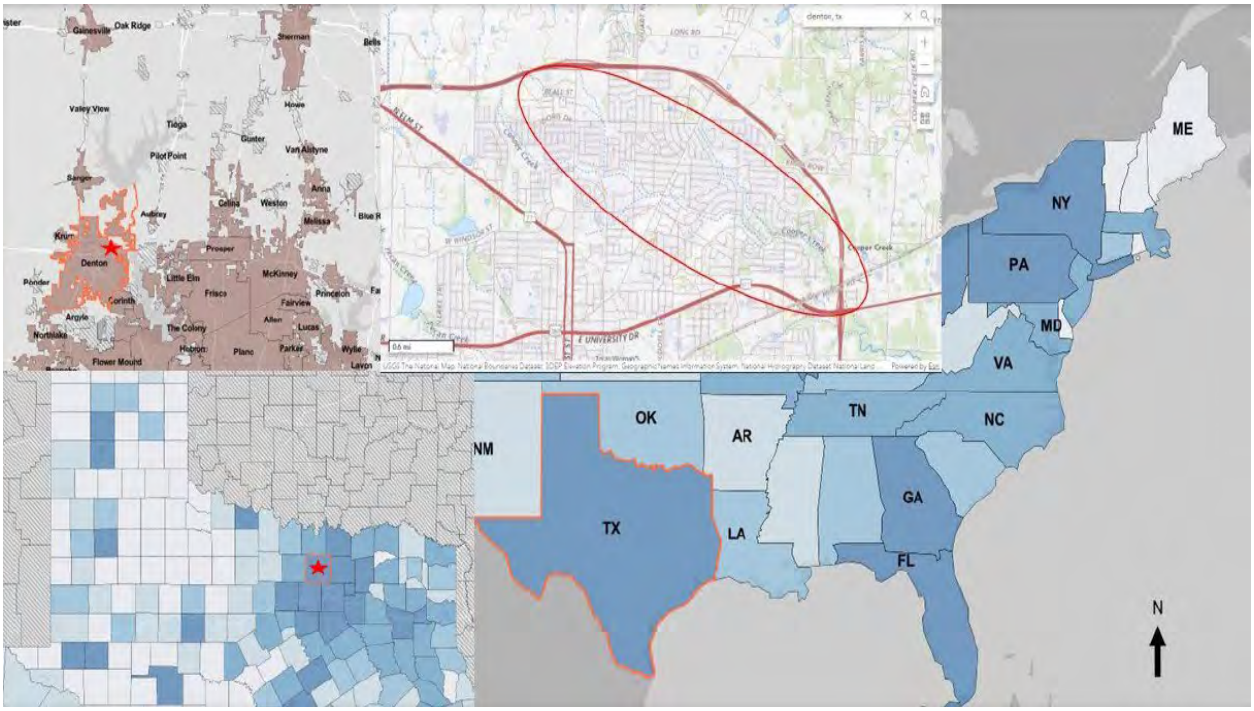

Figure 1 - Cooper Creek Study Area

Figure 2 - Cooper Creek Project Area (red outline)

This report documents the studies and coordination conducted to determine whether the Federal Government should participate in flood risk management measures along Cooper Creek at Denton, Texas. The study of potential flood risk management measures considered a wide range of alternatives and the environmental consequences of those alternatives, but focused mainly on actions that would provide efficient and effective management of flood risk to the surrounding community. Although flood risk management is a high priority mission for the United States Army Corps of Engineers (USACE), flood risks due to high flows along Cooper Creek do not generate sufficient benefits to allow USACE to recommend a project to Congress. USACE can only recommend to Congress flood risk management measures cost-shared by non-Federal partners. The City of Denton has provided a letter of intent dated 29 June 2023 which includes the non-Federal sponsor (NFS) intention to cost share in Federally constructed flood risk management measures along Cooper Creek. The partnership of Federal and non-Federal interests in flood risk management measures helps ensure that those measures will effectively serve both local and national needs.

1.3. Related Studies and Reports

February 1982. United States Army Corps of Engineers. *Detailed Project Report Cooper Creek Denton, Texas*. Previous study on Cooper Creek terminated due to lack of benefits.

December 2003. DEH Consulting. *Preliminary Analysis of City of Denton Drainage Capital Improvement Pl*an. Analysis developing preliminary plan for the City of Denton Drainage Capital Improvement Plan and prioritizing the projects according to the need and benefit of the public.

July 2009. Jacobs Engineering. *Cooper Creek Flood Mitigation Preliminary Engineering Final Report*. Discussed flood mitigation options and costs along Cooper Creek.

December 2009. Freese Nichols. *Cooper Creek and Pecan Creek Tributary PEC-4 Regional Drainage Studies*. Study to determine an effective approach to managing the 100-year floodplain within Cooper Creek and Pecan Creek watersheds.

August 2012. Olsson Associates. *Drainage Report Replacement Bridge 716.40 Choctaw Subdivision Cooper Creek, Denton, Texas*. Report to support application for a City of Denton Floodplain Development Permit for the replacement of an aging timber railroad bridge with a modern concrete bridge by the Union Pacific Railroad.

Mar 2020. KCE Engineering. *Mockingbird Multi-Family Flood Study Denton, Texas*. Study to determine the existing 100-year floodplain along a tributary to Cooper Creek adjacent to a proposed multi-family development and determine is floodplain reclamation is required and possible for the development.

April 2023. Pacheco Koch. *Avondale Park Channel Stabilization Project-Design Alternatives Feasibility Report City of Denton, Denton County, Texas*. Analyzed, proposed, and designed channel stabilization and erosion protection improvements along Cooper Creek in Avondale Park. Three alternatives were conceptually designed.

2. EXISTING CONDITIONS

This chapter presents a description of the resources and baseline conditions that could be affected from implementing the proposed alternative in compliance with National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ), and 32 Code of Federal Regulations (CFR) 775 guidelines. The level of detail used in describing a resource is commensurate with the anticipated level of potential environmental impact. The study area occurs along Cooper Creek which flows through the City of Denton, Texas. Cooper Creek is located in central Denton County, which is in the northcentral portion of the state (Figure 1). Cooper Creek runs through a developed area of Denton, Texas. Recurrent flooding of Cooper Creek induces damages to adjacent properties, increases risk to human health and safety, and inundates roadways resulting in road closures, traffic delays and increased emergency response times. At least one known fatality has been attributed to flood waters from Cooper Creek. In addition, high flow events are contributing to erosion downstream of Avondale Park with the channel encroaching on residential lots and fence lines.

2.1. Existing Infrastructure

The study area of Cooper Creek spans across the city of Denton, Texas, and includes multiple crossings of interest, primarily within areas of heavy residential development. Beginning downstream, Cooper Creek crosses Mingo Road. Mingo Road currently is overtopped during flooding events, affecting emergency response and evacuation times, but does not create backwater affects nor damage to any structures directly upstream from the crossing. The Nottingham Drive crossing is just downstream of Avondale park; flooding seems to cause minimal structural damages at this point, however, there is evidence of bank erosion downstream of this location. At East Sherman Drive, a bend occurs directly at the crossing with the low-lying area occurring just upstream and to the north of the crossing. Sanitary sewer lines currently run parallel to the creek but may be relocated by the City prior to or concurrently with this project. Overloading and surcharging of the local storm drain system is likely during flooding events, with this location having the most properties experiencing flooding. The upstream limit of the project area does not appear to include any structures that experience flooding and will likely not fall within the scope of the study.

2.2. Physical Environment

2.2.1. Climate

The climate of the study area is humid subtropical with warm to hot summers and mild winters. The average annual high temperature is about 76 degrees Fahrenheit, with an average summer high of about 96 degrees for the months of June, July, and August, and an average annual winter low temperature of 54 degrees. Periods of freezing temperatures are infrequent and rainfall averages about 38 inches annually (U.S. Climate, 2024). Severe weather occurs periodically in the form of severe thunderstorms, tornadoes, flood-producing extreme precipitation events, and occasional winter ice storm (Runkle et al, 2022).

2.2.2. Hydrology

Cooper Creek is located In the northern part of the City of Denton, Texas. The creek flows in a southeasterly direction though the city and terminates at Lewisville Lake. The watershed of Cooper Creek is about 6.1 miles long and conveys a drainage area of approximately 9.64

square miles. The creek is generally small but well defined, mostly unimproved channel with several tributaries. The main channel has an average depth of 6 feet, a top width of 50 feet and a slope of 25 feet per mile. The creek is normally dry with flow occurring during periods of heavy rainfall. The Cooper Creek watershed is shown in Figure 3.

Figure 3 - Cooper Creek Watershed

Cooper Creek is generally a trapezoidal, unlined earthen channel. There are several culvert crossings that have limited capacity and cause backwater conditions within the stream channel. The 100-year floodplain generally extends beyond the stream banks and into the residential yards. Existing detention ponds were constructed within Cooper Creek watershed to reduce flood damages along the creek. There is some channel erosion along Cooper Creek due to high velocities in the channel.

At present, most of the development within Cooper Creek watershed is residential (mostly single-family), with a few schools and parks scattered within the watershed. While the watershed is nearly fully developed, there are a few areas in the upstream reaches of Cooper Creek and its tributaries that are presently undeveloped and future development of these areas may worsen the backwater problems, causing additional flooding along Cooper Creek. Commercial development is widely scattered throughout the lower end of the watershed and has only minimal flood damage potential. Much of the vegetative cover is in its natural state except where residential development has encroached upon the creek in the upper end of the watershed.

2.2.3. Geology

The project area is in a region known as the Eastern Cross Timbers Ecoregion. The region extends southward from the Red River through eastern Denton County and along the boundary between Dallas and Tarrant counties. It then stretches through Johnson County to the Brazos River and into Hill County (Butler, 2022). The region includes rolling hills, cuestas, and ridges. Soils within the Cross Timbers are mostly sandy, loamy, and are underlain by sand, shale, clay, sandstone, calcareous shale, and limestone. Today, livestock farming is the main land use, but some cropland also occurs (Texas Parks and Wildlife Department (TPWD)-A 2024). The City of Denton sits on top of the Grayson Marl rock formation. Grayson Marl, mostly marl, is light-greenish-gray to medium-gray, weathers to grayish yellow. Thickness of Grayson Marl in Texas is between 15 and 60 feet (United States Geological Service (USGS), 2024).

2.2.4. Soils

The Farmland Protection Policy Act (FPPA) (Public Law 97-98, Title XV, Subtitle I, Section 1539-1549 requires federal actions to minimize unnecessary and irreversible conversion of farmland to nonagricultural uses, specifically prime farmlands. The Act defines prime farmlands as "…land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion…" The Natural Resources Conservation Service (NRCS) is responsible for designating soils as prime farmland soils.

The project area consists of a variety of ground cover types with the majority consisting of disturbed soils covered by urban development as the City of Denton has grown around the banks of Cooper Creek. The proposed footprint of the project does not include land or soil suitable for agricultural activities. Based on the Soil Survey of Denton County, Texas (Soil Conservation Service, 1988), soils surrounding the project area are classified in the Sanger and Wilson-Urban land complex soil series, which are classified as a clay-loke and well-drained soils weathered from claystone with low slopes (Figure 4). According to Soil Survey Geographic Database (SSURGO) information acquired from the Natural Resources Conservation Service (NRCS 2024), soils within the Sanger and Wilson-Urban series are not considered prime farmlands (Soil Survey Staff, 2024).

Figure 4 - Cooper Creed Soils Map 2024

2.2.5. Surface Water

Cooper Creek lies in the Elm Fork Trinity Watershed (Hydrologic Unit Code (HUC) 12030103). Streams in the watershed vary from slow, meandering streams flowing to smaller, riffle and pool types in the smaller watersheds. Cooper Creek is a 6.3-mile-long tributary to the Trinity River which eventually leads into Lewisville Lake.

The project area consists of a shallow stream about 10 feet wide. Flow through the site is generally slow moving and perennial. Despite erosion occurring in the area, turbidity is low, and the water clarity is good. The stream bed is composed of some clays and silts towards the center of the channel, while red clays are found along the shoreline and at the East Sherman Drive bridge.

2.2.6. Floodplains

The project area is classified as Zone AE Regulatory Floodway on the Federal Emergency Management Flood Insurance Rate Map as part of the Denton County Unincorporated Areas (48121C0360G) (Figure 5). Immediately in the project area, floodplain characteristics are restricted on either side by residential housing communities (Federal Emergency Management Agency (FEMA) 2023).

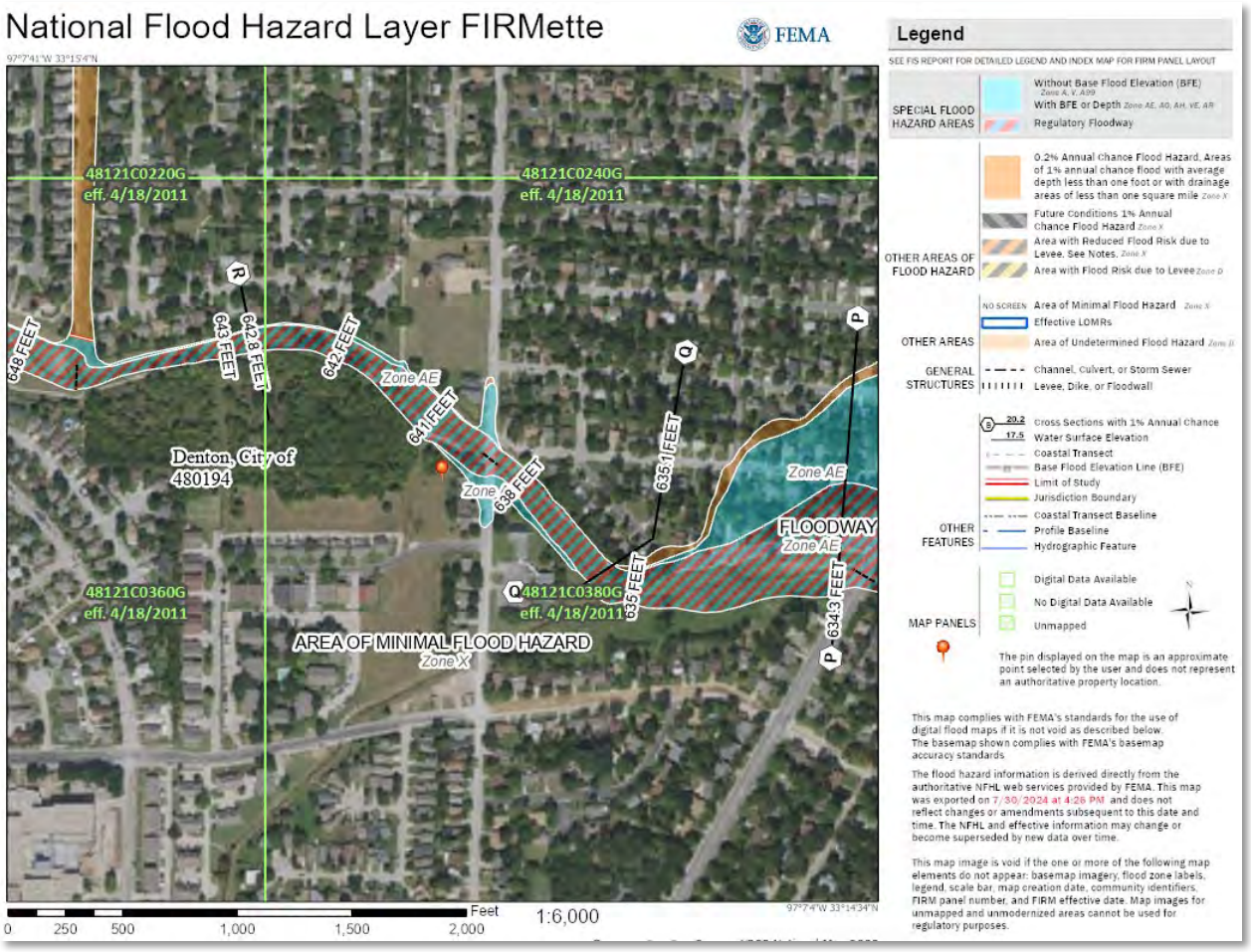

Figure 5 - FEMA Flood Insurance Map for Cooper Creek Project Area

2.2.7. Water Quality

Regional water quality is influenced by lithology, soil composition and land use activities. In Denton County, rugged upland areas have been cleared for urban use. Community housing, businesses, and recreation are important land uses. Cooper Creek is part of the Upper Elm Fork Trinity Watershed. Water quality in the Trinity River Basin is generally good while average stream gradients and dissolved oxygen levels are typically lower than waters in the lower basin, whereas turbidity, total suspended solids, total organic carbon, total phosphorus and biochemical oxygen demand values are typically higher (TWDB, 2024).

Section 303(d) of the Clean Water Act (CWA) requires states to identify waters where existing pollution controls are not stringent enough to achieve state water quality standards and establish a priority ranking of these waters. The Texas Commission on Environmental Quality is responsible for assessing water quality monitoring data and developing 303(d) list every two years in accordance with the CWA. The Texas Draft 2024 303(d) List represents the most recent evaluation of water quality data. Cooper Creek is not listed as an impaired waterbody for any appraised metrics. There are no waterbodies upstream of Cooper Creek that would contribute to the understanding of its water quality (Texas Commission on Environmental Quality (TCEQ), 2024).

2.2.8. Wetlands

Wetlands are often defined as areas where the frequent and prolonged presence of water at or near the soil surface drives the natural system including the type of soils (i.e. hydric soils) that form, the plants that grow and the fish and/or wildlife that use the habitat. The existing project footprint (Figure 6) covers approximately 27.3 acres with 1.1 acres occurring within Freshwater Forested/Shrub Wetland and 5 acres of that occurring in Riverine wetlands.

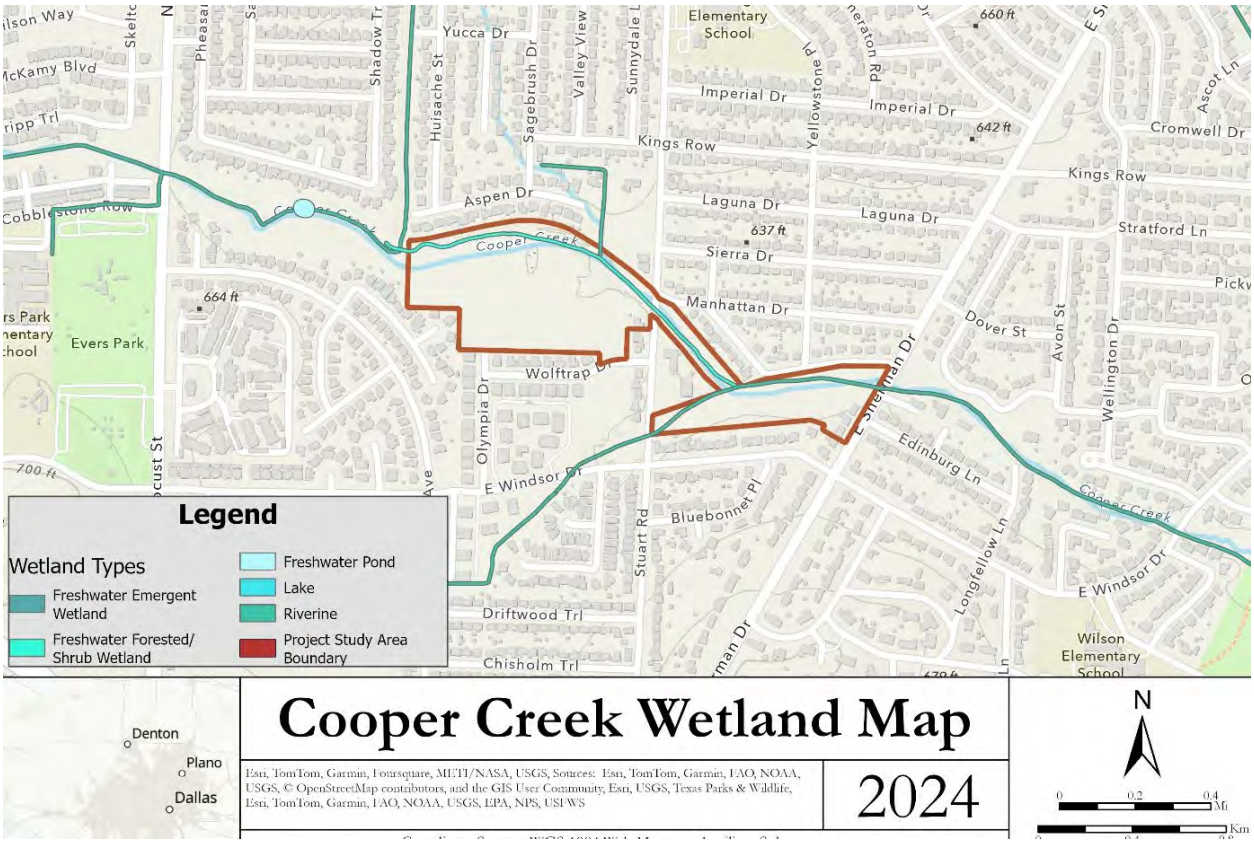

Figure 6 - Cooper Creek Wetland Map

2.2.9. Air Quality

The U.S. Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality nationwide. The Clean Air Act (42 United States Code (U.S.C.) 7401 et seq.), as amended, requires the EPA to set National Ambient Air Quality Standards (NAAQS) for wide-spread pollutants from numerous and diverse sources considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards classified as either “primary” or “secondary.” Primary standards set limits to protect public health, including the health of at-risk populations such as people with pre-existing heart or lung diseases (such as asthma), children, and older adults. Secondary standards set limits to protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings.

EPA has set NAAQS for six principal pollutants, which are called “criteria” pollutants. These criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), sulfur dioxide (SO_2) and lead (Pb). If the concentration of one or more criteria pollutant in a geographic area is found to exceed the regulated “threshold” level for one or more of the NAAQS, the area

may be classified as a non-attainment area. Areas with concentrations of criteria pollutants that are below the levels established by the NAAQS are considered either attainment or unclassifiable areas.

The project area is located within Denton County, Texas and is part of an area designated as non-attainment, meaning concentrations of criteria pollutants are above the levels established by the NAAQS (EPA 2024). Due to the area's NAAQS non-attainment status, if the study were to continue a General Conformity determination would be required.

2.2.10. Noise

Federal and local governments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise. The Federal Interagency Committee on Urban Noise developed land-use compatibility guidelines for noise in terms of day-night average sound level (DNL). It is recommended that no residential uses, such as homes, multifamily dwellings, dormitories, hotels, and mobile home parks, be located where the noise is expected to exceed a DNL of 65 decibels (dBA). For outdoor activities, the EPA recommends DNL of 55 dBA as the sound level below which there is no reason to suspect that the general population would be at risk from any of the effects of noise (EPA, 1974). Noise-sensitive receptors are facilities or areas where excessive noise may disrupt normal activity, cause annoyance, or loss of business. Land uses such as residential, religious, educational, recreational, and medical facilities are more sensitive to increased noise levels than commercial and industrial land uses.

Review of the project area show that it is in an urban area comprised of residential homes and businesses. There would be temporary noise disturbance from construction associated with the project.

2.2.11. Hazardous, Toxic and Radioactive Waste (HTRW)

In order to complete a feasibility level HTRW evaluation for the Cooper Creek CAP 205, a records search was conducted following the rules and guidance of ER 1165-2-132: HTRW Guidance for Civil Works Projects, and American Society for Testing and Materials (ASTM) E1527-13: Standard Practice for Environmental Site Assessment: Phase 1 Environmental Site Assessment Process. In the records review, files, maps and other documents that provide environmental information about the project area are obtained and reviewed. To complete the records review, USACE reviewed publicly available databases and sources, using the proposed footprint of the project, along with an approximate 1-mile search distance for each of the sources. The records search revealed several HTRW sites in the vicinity of the project area, although none of these sites have the potential to affect the proposed project. See the future without project, alternative analyses, and the HTRW appendix for more information about risks from these sites.

Cooper Creek has several potential HTRW sites in relative proximity (one mile) to the proposed project footprint, including 6 registered petroleum storage tanks, an oil and gas pipeline, as well as 1 Resource Conservation and Recovery Act (RCRA) Corrective Action site and 4 Toxic Release Inventory sites located adjacent within a mile of the target area. With populations increasing worldwide, more development and thus an increase in HTRW instances, is expected in future decades that could potentially have negative impacts on Cooper Creek. However, the current identified sites within one mile of the proposed project have an extremely low potential to impact the project as they are not located directly in the creek.

Although not classified as HTRW, pipelines and oil wells play an important role in the existing HTRW conditions in and around Cooper Creek. The oil and natural gas pipelines that cross Cooper Creek will need to be avoided. Refer to the HTRW Appendix for locations of known pipelines in and around the project area. The project alternatives involving disruption of the sediment may need to consider the locations of these oil and gas pipelines. The identified potential HTRW sites are not in the creek itself which eliminates potential impacts.

2.3. Biological Resources

2.3.1. Vegetation

The study area is located within the Cross Timbers and Prairies ecoregion, which covers the upper center portion of the state of Texas. Grassland species such as little bluestem, Indiangrass and big bluestem are common. Texas mulberry, American elm and Osage orange are more common here than they were to the east. In the west, live oak becomes more important, replacing the post oak of the east. Decreasing moisture discourages clusters of trees, and trees form isolated stands. Flameleaf sumac, redbud, Mexican plum and Eastern red cedar become more prevalent. Wildlife is a mixture of eastern forest and prairie species.

2.3.2. Aquatic Resources

Cooper Creek has habitat conditions that can support many species of fish and invertebrates (Table 1). Fish communities characteristically in the area include a sunfish and minnow-dominated community along with darters and occasional catfishes and an assemblage of macroinvertebrates. No protected or sensitive species are known to occur in the creek.

Table 1 - Aquatic Species Potentially Occurring in the Cooper Creek Project Area

Common Name	Scientific Name
Microcaddisfly	*Paucicalcaria ozarkensis*
Nearctic Paduniellan Caddisfly	*Paduniella nearctica*
Mayfly	*Paraleptophlebia calcarica*
Elevated Spring Amphipod	*Stygobromus elatus*
Boston Mountains Crayfish	*Cambarus causeyi*
Alabama Shad	*Alosa alabamae*
White perch	*Pomoxis annularis*
Pyramid Pigtoe	*Pleurobema rubrum*
Purple Lilliput	*Toxolasma lividum*
Isopod	*Lirceus bicuspidatus*
Queen Snake	*Regina septemvittata*

Common Name	Scientific Name
Alligator Gar	*Atractosteus spatula*
American Eel	*Anguilla rostrata*

2.3.3. Wildlife

Considerable urban growth and expansion throughout the area surrounding Cooper Creek has caused local wildlife to become fragmented. Cooper Creek serves as a green corridor that provides ample habitat for several common species of birds and mammals. Table 2 provides a partial list of common bird and mammal species known to occur in areas near the project area that may use the project area for foraging, nesting, resting, or migration.

Table 2 - Common Wildlife Species in the Vicinity of the Cooper Creek Project Area

Common Name	Scientific Name	Common Name	Scientific Name
Birds			
Black vulture	*Coragyps atratus*	Ring-neck duck	*Aythya collaris*
Blue jay	*Cyanocitta cristata*	Wood duck	*Aix sponsa*
Cardinal	*Cardinalis*	Mockingbird	*Mimus polyglottos*
Common yellowthroat	*Geothlypis trichas*	Mourning dove	*Zenaida macroura*
Eastern phoebe	*Sayornis phoebe*	Robin	*Turdus migratorius*
Eastern wood-pewee	*Contopus virens*	Turkey vulture	*Cathartes aura*
Great horned owl	*Bubo virginianus*	Red-tailed hawk	*Buteo jamaicensis*
Mammals			
Little brown bat	*Myotis lucifugus*	Opossum	*Didelphis virginiana*
Eastern gray squirrel	*Sciurus carolinensis*	Raccoon	*Procyon lotor*
White-tailed deer	*Odocoileus virginianus*	Nine-banded armadillo	*Dasypus novemcinctus*
Eastern cottontail	*Sylvilagus floridanus*	Eastern chipmunk	*Tamias striatus*
Woodchuck	*Marmota monax*	Beaver	*Castor canadensis*

Common Name	Scientific Name	Common Name	Scientific Name
Striped skunk	*Mephitis*	Bobcat	*Felis rufus*

2.3.4. Federal and State Threatened and Endangered Species

The United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool was utilized to determine species listed under the Endangered Species Act that may occur in or near the Cooper Creek study area (USFWS, 2024). A total of five Federally threatened or endangered species were identified; however, the project area only contains suitable habitat for one species (Table 3). No Federally designated critical habitat for any of the listed species is present in the action area. The bald eagle has been delisted but the protections provided by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act remain in effect.

Table 3 - Federal Listed Species Identified on the IPaC for Cooper Creek

Species Name	Status	Habitat Description	Suitable Habitat in the Action Area
Mammals			
Tricolored Bat *Perimyotis subflavus*	PE	Summer habitat: wide variety of forested/wooded habitats for roosting. Roost among leaves of live or recently dead deciduous hardwood trees, but may also be found in Spanish moss, pine trees, and occasionally manmade structures. Winter habitat (hibernacula): caves or abandoned mines.	Summer Habitat: Yes Winter Habitat: No
Birds			
Whooping crane *Grus americana*	E	Dense marshes and wetlands with nest sites found primarily located in shallow diatom ponds that contain bulrush. During migration, whooping cranes use a variety of habitats; however, wetland mosaics appear to be the most suitable.	No -Urban area with sparse forested riparian area lacking wetlands/marshes
Piping plover *Charadrius melodus*	T	Coastal shorelines and open mudflats and sandy areas.	No- Open areas around the creek are grassy and disturbed. Lack sandy areas.

Species Name	Status	Habitat Description	Suitable Habitat in the Action Area
Rufa red knot *Calidris canutus rufa*	T	Wintering and migration habitats are muddy or sandy coastal areas, specifically, bays and estuaries, tidal flats, and unimproved tidal inlets with sand spits, islets, shoals, and sandbars	No - shorelines are urbanized and surrounded by patches of Riparian Forest

E= Endangered T= Threatened PE= Proposed Endangered PT= Proposed Threatened C= Candidate

Source: U.S. Fish and Wildlife Service IPAC website and Arkansas Ecological Service Office database

2.4. Recreational Resources

Occasional fishing, hiking or wildlife watching may occur immediately along the creek; however, the creek is bordered on all sides by private land making other recreational activities unavailable due to restricted land access.

2.5. Socio-Economic Conditions

Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly population, demographics, and economic development. Demographics entail population characteristics and include data pertaining to race, gender, income, housing, poverty status, and educational attainment. Economic development or activity typically includes employment, wages, business patterns, an area's industrial base, and its economic growth.

The socio-economic characteristics of Denton, Texas, the nearest town located near the project study area are presented in Table 4. The City of Denton had a population of 158,349 living in 52,000 households in 2022. The racial makeup of the city was 67.8 percent White, 11.5 percent African American, 0.8 percent Native American, 3.5 percent Asian, 0.0 percent other, and 11.1 percent from two or more races. Of the total population, 24.1 percent were of Hispanic or Latino origin. Roughly 15.7 percent of families in the city live below the poverty line (U.S. Census Bureau, 2022).

Table 4 - Population Data for Denton, Texas

Population Metric	Denton, Texas
Total Population	158,349
Total Households	52,000
White	67.8%
Black or African American	11.5%
Native American or Alaska Native	0.8%
Asian	3.5%
Native Hawaiian or Other Pacific Islander	0.0%
Other Race	0.0%
Two or More Races	11.1%
Hispanic	24.1%
Under 5 years	4.9%
5 to 19 years	18.5%
20 to 64 years	64.4%
Over 64 years	12.2%
High School Diploma	91.5%
Bachelor's Degree or Higher	40.0%
Median Household Income	$71,717

2.6. Incorporating the Needs and Considerations of All At-Risk Communities

An analysis using the Climate and Economic Justice Screening Tool (CEJST) was conducted to identify at risk communities in or near the project area (Figure 7). The tool identifies at risk communities if they are in a census tract that meets the thresholds for at least one of the tool's categories of burden, or if they are on land within the boundaries of Federally Recognized Tribes. The CEJST showed that a portion of the area surrounding the project area was characterized as being at risk.

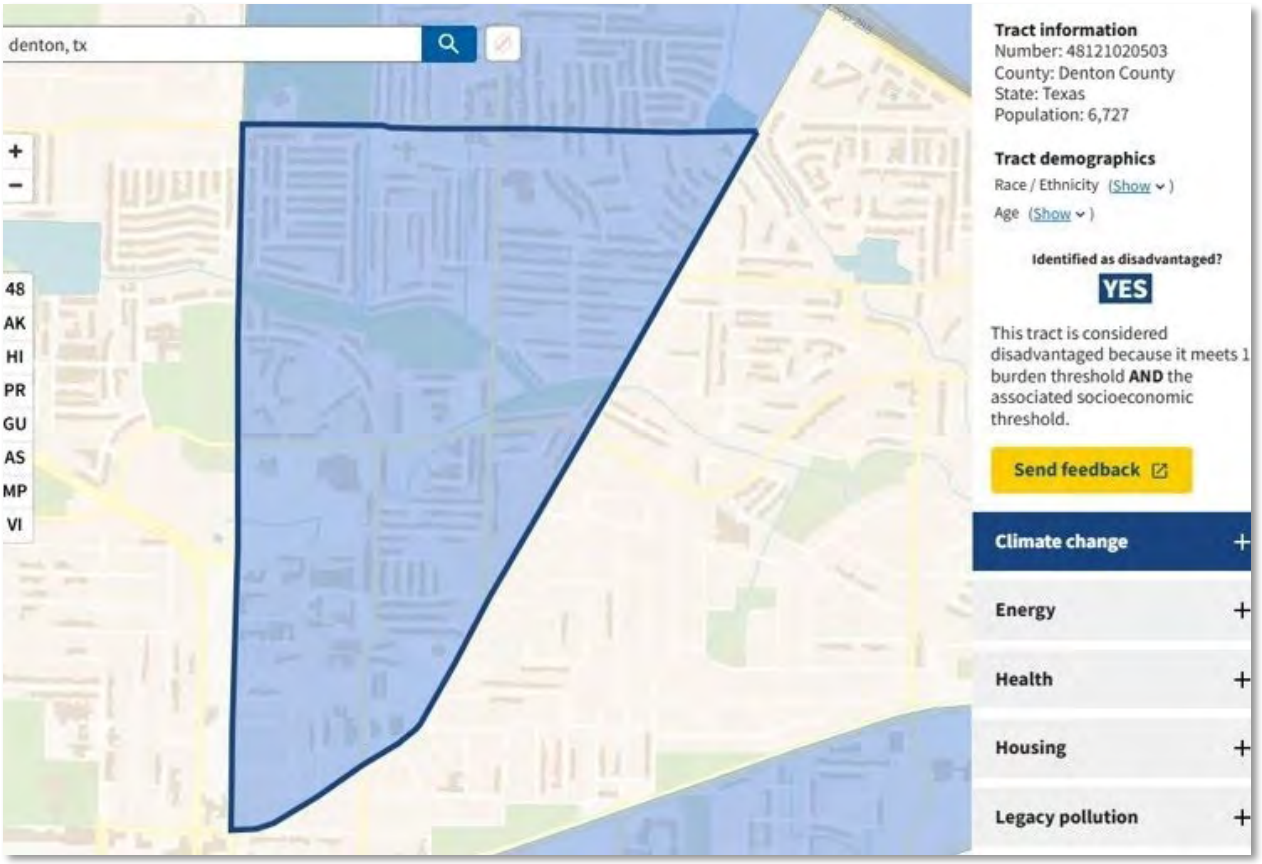

Figure 7 - Climate and Economic Justice Screening Tool Results for the Cooper Creek Project Area

2.7. Cultural Resources

The study area is located on the southern plains in north Texas in the City of Denton along Cooper Creek. The study area is heavily developed for residential and commercial use and the banks and channel of Copper Creek have been modified to control erosion. There are numerous cultural resources recorded within the region that include the National Register of Historic Places (NRHP) listed properties, archeological sites, cemeteries, and historical markers. A preliminary assessment of the cultural resources within one kilometer of the proposed study area was conducted using a desktop review of the databases maintained by the Texas Historical Commission and the Texas Archeological Research Laboratory for cultural resources as well as a review of historic aerial imagery. The assessment identified one previously recorded cultural resource, the Fairhaven Retirement Home, a NRHP listed property, approximately 950 meters from the proposed study area. There are no other previously recorded cultural resources.

Only two previous archeological surveys are within one kilometer of the study area. Both surveys were conducted in 1993 for the Federal Highway Administration along United States (U.S.) Highway 77 and North Locust Street. While there have been numerous cultural resource investigations conducted in the surrounding region, there are no other previous investigations in the proposed study area or within one kilometer.

The primary considerations concerning cultural resources are threats to buried archeological deposits because of earthmoving activities. However, most of the study area has been

developed for residential and commercial use. The soils within the study area are mapped as Sanger-Urban land complex and Wilson-Urban land complex, both clayey soils originating from alluvium from weathered slopes and bedrock. Although the area has not been previously investigated, the residential and commercial development and the presence of urban soils in the study area suggest that the probability for intact archeological sites to occur in the area is low.

3. FUTURE WITHOUT PROJECT CONDITIONS

3.1. Physical Environmental

The watershed is nearly fully developed, however, there are a few areas in the upstream reaches of Cooper Creek and its tributaries that are presently undeveloped. Commercial development is widely scattered throughout the lower end of the watershed and has only minimal flood damage potential. Future development of these areas may worsen the backwater problems, causing additional flooding along Cooper Creek. Temperature, drought, and rainfall intensity in the study area are projected to increase in the future, while streamflow trends are projected to decrease (USACE 2015).

3.2. Economic Conditions

To illustrate the extent of flooding, Table 5 displays single event damages (unweighted by probability) for the suite of flood events included in an FDA analysis. At higher frequency events, depths relative to first floor structure elevations and estimated damages are limited, while at lower frequencies, they are higher and at the extreme (0.002 Annual Exceedance Probability (AEP)) structure and content damages total $7.8 million. Total Expected Annual Damage (EAD) across the range of modeled flood events is roughly $907,000.

Table 5 - Single Event Flood Depths and Damages for Structures with Modeled Damages (Monetary Values in $Millions)

Annual Exceedance Probability	0.5 AEP	0.2 AEP	0.1 AEP	0.04 AEP	0.02 AEP	0.01 AEP	0.005 AEP	0.002 AEP
Depth Relative to First Floor Elevations								
Mean	0.80	0.40	0.20	0.06	0.24	0.41	0.52	0.64
Standard Deviation	0.00	0.64	0.68	0.69	0.72	0.73	0.79	0.86
Maximum	0.16	1.06	1.48	1.98	2.54	3.07	3.57	4.23
Minimum	1.82	1.93	1.92	1.82	1.89	1.51	1.46	1.95
Single Event Damages $millions								
Structures	$0.20	$0.85	$1.50	$2.31	$2.86	$3.46	$4.01	$4.90
Content and vehicles	$0.15	$0.56	$0.95	$1.43	$1.73	$2.06	$2.36	$2.88
Total	$0.34	$1.42	$2.45	$3.75	$4.59	$5.53	$6.37	$7.78

Figure 8 - Flood Inundation at the 0.10 Annual Exceedance Probability Event (10-year Frequency Event)

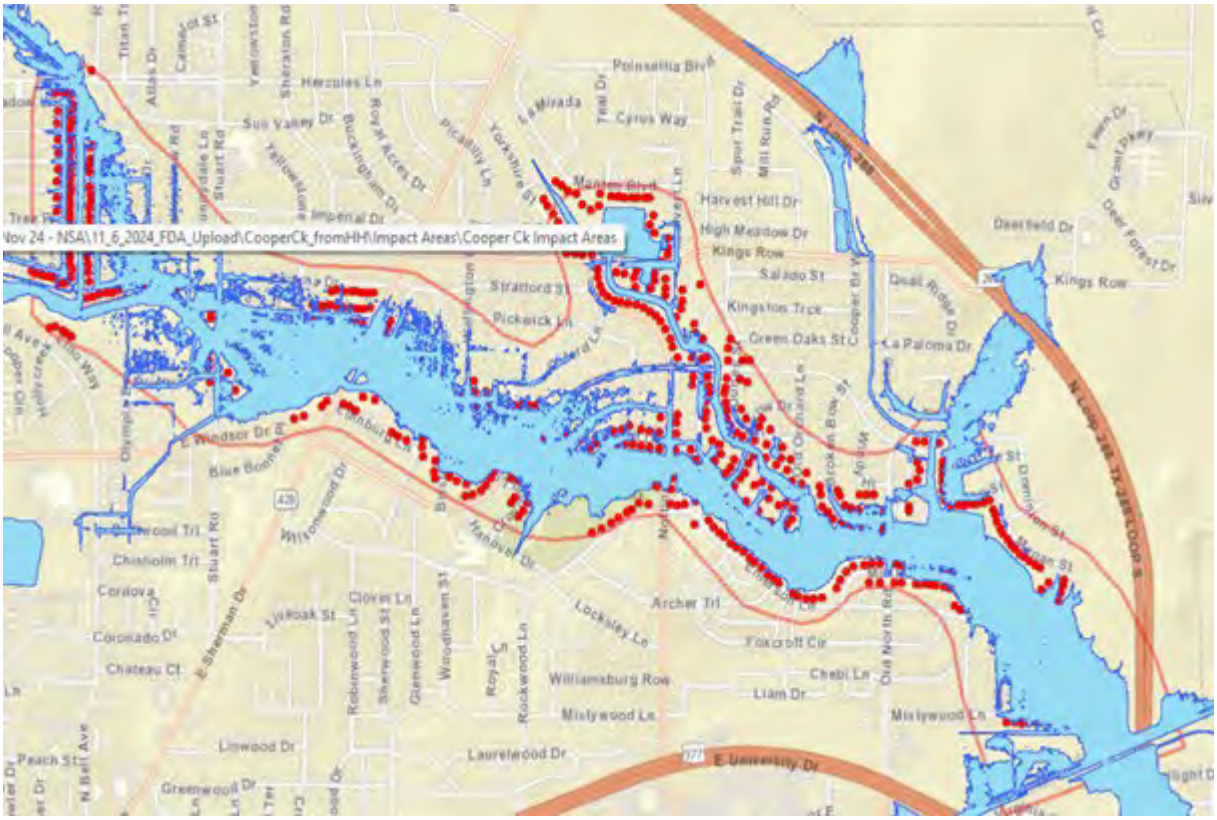

Figure 9 - Flood Inundation at the 0.002 Annual Exceedance Probability Event (500-year Frequency Interval)

3.2.1. Planned Development

The project area is mostly fully developed along Cooper Creek. There are minimal development opportunities within the project area that are not currently designated as Regulatory Floodway by FEMA. Along Stuart Road, there are openings for possible minor residential development; it can be reasonably assumed that this would not significantly affect flooding currently highlighted along Cooper Creek. The same can be assumed for the expansion of impermeable surfaces that would come with the expansion of Avondale park and commercial development just downstream of Mingo Road.

3.3. Biological Environment

Under the No Action Alternative, Biological Resources are expected to remain the same as described in the Existing Conditions Section of this report.

3.4. Cultural Resources

There are no previously recorded cultural resources located within the proposed project area and the formation processes that currently affect these sites will continue into a future without the project. Undiscovered cultural resources could be at risk of displacement or degradation from flood events and future development in the region. These formation processes may result in partial or total loss of historic properties.

3.5. HTRW

No Recognized Environmental Conditions were identified within one mile of the project area that could be reasonably expected to affect the Cooper Creek CAP 205 project. Although not classified as HTRW under USACE regulations, several oil and gas infrastructure sites were identified within the surrounding area. As a result of these findings, pipelines and wells within the project vicinity and along potential site access routes should be precisely located during PED to ensure no unintended interaction occurs with the existing oil and gas facilities.

Despite the lack of identified sites that could be reasonably expected to affect the project, there is always a possibility that previously unidentified HTRW could be uncovered, even when a proposed project is entirely within a preexisting project footprint. An updated HTRW survey will be required should the project be reconsidered and funded at a future time. Additionally, care should be taken to identify and address HTRW concerns that may arise in a timely manner, so as not to affect proposed project timelines.

3.6. Summary of Future Without Project Conditions

If No Action is taken to address flooding along Cooper Creek, the most likely future condition of the area is as follows:

- Recurrent flooding of Cooper Creek will continue to cause damages to adjacent properties.
- Increased risk to human health and safety as a result of inundated roadways, road closures, traffic delays, and increased emergency vehicle response times.
- If no action is taken at Cooper Creek, the streambank will continue to erode downstream of Avondale Park and cause encroachments on residential lots and fence lines.

4. PLANNING CRITERIA / PURPOSE AND NEED FOR THE PROPOSED ACTION

4.1. Problem Statements

- Recurrent flooding of Cooper Creek induces damages to adjacent properties
- Recurrent flooding of Cooper Creek presents risks to human health and safety

4.2. Federal Objective

The Federal objective of water and related land resources project planning is to contribute to national economic development consistent with protecting the nation's environment pursuant to national environmental statutes, applicable EOs, and other Federal planning requirements.

4.3. Study Objectives

- Reduce risk of flood induced damages in the vicinity of Cooper Creek over the 50-year period of analysis.
- Reduce risk to human health and safety in the vicinity of Cooper Creek over the 50-year period of analysis.

4.4. Opportunities

- An opportunity exists to reduce bank erosion induced by high flows in Cooper Creek, especially Avondale Park and downstream of Avondale Park.
- An opportunity exists to combine new recreation features with a flood risk management plan
- An opportunity exists to provide the public educational information about their flood risk
- An opportunity exists to evaluate existing habitat and possibly use engineering with nature (bioengineering)
- An opportunity exists to improve water quality (sediment and bacteria)
- An opportunity exists to improve emergency response time in the vicinity of Cooper Creek over the 50-year period of analysis

4.5. Constraints

4.5.1. Universal Constraints

- Avoid or mitigate for historic and cultural resources (impacts now are mainly from erosion)
- Avoid or mitigate for environmental resources and impacts

4.5.2. Specific Study Constraints

- Lands on either side of Cooper Creek and its tributaries is almost completely developed.
- Utilities run parallel to Cooper Creek

- NFS existing and future projects to Cooper Creek may affect plan formulation and economic analysis during feasibility
- City requires that improvements have no negative impacts on other properties

4.6. Planning Criteria

Federal Principles and Guidelines establish four criteria for evaluation of water resources projects. Those criteria and their definitions are listed below.

4.6.1. Acceptability

Acceptability is defined as “the viability and appropriateness of an alternative from the perspective of the Nation’s general public and consistency with existing Federal laws, authorities, and public policies. It does not include local or regional preferences for particular solutions or political expediency.”

4.6.2. Completeness

Completeness is defined as “the extent to which an alternative provides and accounts for all features, investments, and/or other actions necessary to realize the planned effects, including any necessary actions by others. It does not necessarily mean that alternative actions need to be large in scope or scale.”

4.6.3. Effectiveness

Effectiveness is defined as “the extent to which an alternative alleviates the specified problems and achieves the specified opportunities.”

4.6.4. Efficiency

Efficiency is defined as “the extent to which an alternative alleviates the specified problems and realizes the specified opportunities at the least cost.”

4.6.5. Study Specific Evaluation Criteria

A project that effectively serves both Federal and non-Federal interests must be sited, planned, and operated so that it safely and efficiently meets user needs. To this end, the project delivery team PDT economic analysis incorporated the criterion of flood damages prevented to analyze alternatives in conjunction with the National Criteria.

5. FORMULATION AND EVALUATION OF ALTERNATIVES

5.1. Plan Formulation Rationale

Plan formulation is the process of building alternative plans that meet planning objectives and avoid planning constraints. Alternatives are a set of one or more management measures functioning together to address one or more planning objectives. A management measure is a feature or activity that can be implemented at a specific geographic location to address one or more planning objectives. A feature is a "structural" element that requires construction or assembly on-site whereas an activity is defined as a "nonstructural" action. Each alternative plan shall be formulated in consideration of criteria stated in Section 4.6.

5.2. Management Measures

A list of management measures is listed below. The PDT conducted a screening process based on listed criteria with results shown in Table 6.

- Detention basin – Excavated area adjacent to or within Cooper Creek to reduce flood risk and lower the peak discharge by detaining the stormwater runoff for a specific short period of time
- Channel improvements – Straightening the channel or increasing channel capacity by excavating the channel to be deeper and/or wider
- Buyouts- Provide owners an opportunity to sell structures in flood-prone areas for fair market value
- Wet floodproofing- Implementation of modifications that allow protection from hydrostatic pressure damage during flooding (thus reducing probability of structural failure), but allows flood waters into (and out of) the structure
- Raising structures in place- A nonstructural measure that would elevate existing structures to reduce risk of flood damages
- Crossing improvements (including bridge culvert modifications) – Raise the roadway profile and/or increase the hydraulic capacity of the roadway crossing and lower the water surface elevation by adding or modifying the box culvert/ bridge at Sherman Drive, Mingo Road, and/or Blagg Road
- Modify outlet control structures at existing detention basin- An outlet at the detention basin that controls the volume of water/time unit flowing downstream
- Energy Dissipators- Within detention basin or channel-Devices that protect downstream areas by reducing the velocity, energy, and turbulence of the flow within the channel
- Weirs in existing detention basins- A hydraulic structure is used for regulating the flow of water to prevent flooding, stabilize water levels, and improve the quality of aquatic life in the water
- Realign channel a- Straighten channel to allow more water to flow at a faster velocity
- Realign channel b- Create meanders to decrease the velocity of the water in the channel
- Dry floodproofing- Structural or non-structural modifications or additions which prevent flood waters from entering or encroaching on structures

- Warning system- Real-time monitoring and automatic alerts based on water level and flow/volume at Cooper Creek
- Rezoning and repurpose areas in vicinity of Cooper Creek- Rezone or repurpose through local ordinances to prevent development of flood-prone areas in the vicinity of Cooper Creek
- Levee or floodwall- Natural or artificial wall used to prevent overflow of channel and reduce flood risk from flooding events
- Tunnel- An underground floodway that is used to divert excess floodwater from the surface
- Bypass channel- A secondary channel to carry flow around problem areas in the main channel
- Diversion channel-A secondary channel to reduce flow in and carry flow away from the main channel
- Cistern- A large rainwater storage tank used to help reduce storm water runoff and can be used for additional purposes.
- Stormwater system improvements- Actions to improve the flow of water through the city's stormwater system
- Imperviousness reduction- Actions to improve surface to retain more water during high flow events

Table 6 - Cooper Creek Measures Considered

Measure	Evaluation
Structural	
Detention Basin*	Carried Forward
Channel Improvements*	Carried Forward
Crossing Improvements (including bridge/culvert modifications)*	Carried Forward
Modify Outlet Structure at Existing Detention Basins	Ineffective existing outlet structures already close to ground level, levees or floodwalls would be needed
Energy Dissipaters*	It will likely not reduce water surface elevations
Weirs in Existing Detention Basins	Expensive to implement and likely would not significantly reduce flood risk
Realign Channel A - Straighten Channel	Likely to be ineffective as the channel is already fairly straight

Measure	Evaluation
Realign Channel B - Create Meander*s	Constrained by development on both sides of the channel
Levee or Floodwall	Constraint by development on both sides of the channel and there would not be enough room to construct
Tunnel	Flood damages would not support positive net benefits due to the high cost of implementing a tunnel
Bypass Channel	Limited space and cost prohibitive
Diversion Channel	Limited space and cost prohibitive
Cistern	Higher cost than detention area with similar benefits
Stormwater System Improvements	Not within USACE authority
Impervious Reduction	Not within USACE authority
Non-Structural	
Buyouts	Carried Forward
Wet Floodproofing	Carried Forward
Raising Structures in Place	Carried Forward
Dry Floodproofing	Not recommended by the National Non-structural Committee
Warning System	Would not address the objectives and due to proximity of structures to Creek and flashy nature of flooding, would not allow ample time to evacuate
Rezoning and Repurposing Areas in the Vicinity of Cooper Creek	Not be practical as land to either side of Cooper Creek is already developed or utilized for recreation or other purposes

*Includes natural and nature-based (NNB) features

5.2.1. Development of Alternatives

The PDT held a rapid iteration on 9 May 2024 and incorporated the results of this iteration into a planning charrette with the non-Federal sponsor (NFS) on 11 June 2024. During these meetings, the team developed the problems, opportunities, objectives and constraints and held

brainstorming sessions to identify measures which were then screened and combined into preliminary array of fifteen alternatives. Subsequent planning iterations identified three additional alternatives to create the initial array of alternatives. During the subsequent iterations the initial array (to include the additional alternatives) were screened to a final array of eight alternatives.

5.3. Preliminary Array of Alternatives and First Screening

During the planning charrette the preliminary alternatives (Table 7) were identified and evaluated by the PDT.

Table 7 - Cooper Creek Preliminary Array of Alternatives

Alternative	Evaluation
Alternative 1 – No Action	Carried Forward
Alternative 2 – Detention Basin alone	Carried Forward
Alternative 3 – Detention Basin and channel improvements	Carried Forward
Alternative 4 – Detention Basin and nonstructural measure	Carried Forward
Alternative 5 – Detention Basin and Bridge Culvert Modifications	Carried Forward
Alternative 6 – Bridge Culvert Modifications alone	Carried Forward
Alternative 7 – Bridge culvert modification and a nonstructural measure	Carried Forward
Alternative 8 – Channel Improvements and Bridge culvert modifications	Carried Forward
Alternative 9 – Roadway improvements and a nonstructural measure	Carried Forward
Alternative 10 – Channel Improvements alone	Incomplete solution, would require either modifications to the bridge culvert or elevating the roadway or the appropriate location of a detention basin
Alternative 11 – Buyouts alone	Carried Forward
Alternative 12 –Wet floodproofing alone	Structures in the area are slab on grade with no basements,

Alternative	Evaluation
Alternative 13 – Raising structures in place alone	Carried Forward
Alternative 14 – Roadway improvements alone	Incomplete Solution and outside USACE authority
Alternative 15 – Channel Improvements and nonstructural measure	Incomplete solution, would require either modifications to the bridge culvert or elevating the roadway or the appropriate location of a detention basin

* Alternatives 2,3,4, 5, and 8 include NNB features in the form of native plantings.

5.4. Alternatives Carried Forward

The initial evaluation and screening resulted in the following initial array of alternatives.

5.4.1. Alternative 1: No Action

The No Action plan is the plan without Federal action at the project site.

5.4.2. Alternative 2: Detention Basin Alone

Alternative 2 would consist of designing and constructing a detention basin in the vicinity of Cooper Creek.

5.4.3. Alternative 3: Detention Basin and channel improvements

This alternative would include a detention basin in the vicinity of Cooper Creek and channel improvements such as straightening the channel immediately adjacent to Sherman Drive and deepening or widening the channel.

5.4.4. Alternative 4: Detention Basin and nonstructural measure

Alternative 4 combines a detention basin with at least one non-structural measure. Non-structural measures considered for this project include wet floodproofing, raising structures in place and buyouts.

5.4.5. Alternative 5: Detention Basin and Bridge Culvert Modifications

This alternative would consist of a detention basin as well as adding or modifying the box culvert/ bridge at Sherman Drive, Mingo Road, and/or Blagg Road to increase hydraulic capacity.

5.4.6. Alternative 6: Bridge Culvert Modifications alone

Alternative 6 includes adding or modifying the box culvert/ bridge at Sherman Drive, Mingo Road, and/or Blagg Road to increase hydraulic capacity.

5.4.7. Alternative 7: Bridge culvert modification and a nonstructural measure

This alternative is comprised of adding or modifying the box culvert/ bridge at Sherman Drive, Mingo Road, and/or Blagg Road to increase hydraulic capacity as well as at least one non-structural measure. Non-structural measures considered for this project include wet floodproofing, raising structures in place and buyouts.

5.4.8. Alternative 8: Channel Improvements and Bridge culvert modifications

Alternative 8 consists of channel improvements such as straightening the channel immediately adjacent to Sherman Drive and deepening or widening the channel combined with adding or modifying the box culvert/ bridge at Sherman Drive, Mingo Road, and/or Blagg Road to increase hydraulic capacity.

5.4.9. Alternative 9: Roadway improvements and a nonstructural measure

This alternative includes raising the roadway profile of Sherman Drive, Mingo Road, and/or Blagg Road at Cooper Creek as well as at least one non-structural measure. Non-structural measures considered for this project include wet floodproofing, raising structures in place and buyouts.

5.4.10. Alternative 11: Buyouts alone.

Alternative 11 would consist of determining the structures in the impact area prone to damages with various AEP events and a complete purchase of properties at market value and demolish costs of removing structures within the impact area.

5.4.11. Alternative 13: Raising structures in place alone.

This alternative would determine structures in the impact area which are prone to flood damages with various AEP events and raise homes off foundation and place support columns underneath to protect from flooding.

5.4.12. Additional Alternatives

During the third iteration of plan formulation, three (3) additional alternatives were identified and included in the initial array of alternatives prior to screening to obtain the final array.

- Alternative 16: Bridge culvert modifications, channel improvements and a nonstructural measure
- Alternative 17: Detention Basin, Bridge culvert modifications, channel improvements
- Alternative 18: Detention Basin, Bridge culvert modifications, channel improvements and a nonstructural measure

5.5. Second Screening of Alternatives

Table 8 displays the second screening of alternatives, including the additional alternatives.

Table 8 - Cooper Creek Initial Array of Alternatives with Screening

Alternative	Evaluation
Alternative 1 – No Action	Carried Forward
Alternative 2 – Detention Basin alone	Carried Forward for further evaluation
Alternative 3 – Detention Basin and channel improvements	Carried Forward
Alternative 4 – Detention Basin and nonstructural measure	This combination would not produce significant additional benefits over the non-structural alone.
Alternative 5 – Detention Basin and Bridge Culvert Modifications	Carried Forward
Alternative 6 – Bridge Culvert Modifications alone	If you increase capacity at crossing, it is still limited to capacity in channel
Alternative 7 – Bridge culvert modification and a nonstructural measure	Would effectively become non-structural alternative as bridge culver in effective.
Alternative 8 – Channel Improvements and Bridge culvert modifications	Carried Forward
Alternative 9 – Roadway improvements and a nonstructural measure	Likely would not fully within USACE authority. Would effectively become non-structural alternative as bridge culver in effective
Alternative 11 – Buyouts alone	Carried Forward
Alternative 13 – Raising structures in place alone	Carried Forward
Alternative 16 – Bridge culvert modifications, channel improvements and a nonstructural measure	This combination would not produce significant additional benefits over the non-structural alone. .
Alternative 17 – Detention Basin, Bridge culvert modifications, channel improvements	Carried Forward
Alternative 18 – Detention Basin, Bridge culvert modifications, channel improvements and a nonstructural measure	This combination would not produce significant additional benefits over the non-structural alone. .

* Alternatives 2,3,4, 5, 8, 16, 17 and 18 include NNB features in the form of native plantings.

5.6. Final Array of Alternatives

After screening the initial array, the final array identified by the PDT consists of seven (7) alternatives:

- Alternative 1 – No Action
- Alternative 2 – Detention Basin alone
- Alternative 3 – Detention Basin and channel improvements
- Alternative 5 – Detention Basin and Bridge Culvert Modifications
- Alternative 8 – Channel Improvements and Bridge culvert modifications
- Alternative 11 – Buyouts Alone
- Alternative 13 – Raising Structures in Place Alone
- Alternative 17 – Detention Basin, Bridge culvert modifications, channel improvements

6. EVALUATION AND COMPARISON OF FINAL ARRAY

6.1. Detailed Alternative Descriptions

6.1.1. Alternative 1: No Action

If No Action is taken to address flooding along Cooper Creek, the most likely future condition of the area is as follows:

- Recurrent flooding of Cooper Creek will continue to cause damages to adjacent properties.
- Increased risk to human health and safety as a result of inundated roadways, road closures, traffic delays, and increased emergency vehicle response times.
- If no Federal action is taken at Cooper Creek, the streambank will continue to erode downstream of Avondale Park and cause encroachments on residential lots and fence lines.

6.1.2. Alternative 2: Detention Basin Alone

2A (2A1) Detention above Sherman Drive: This alternative seeks to utilize land already owned by the City of Denton and minimize impacts on the environment. An area approximately 500 feet wide and 100 feet long would be excavated (4,800 cubic yards) from the park area upstream of Sherman Drive. Figure 10 shows the location of alternative 2A1.

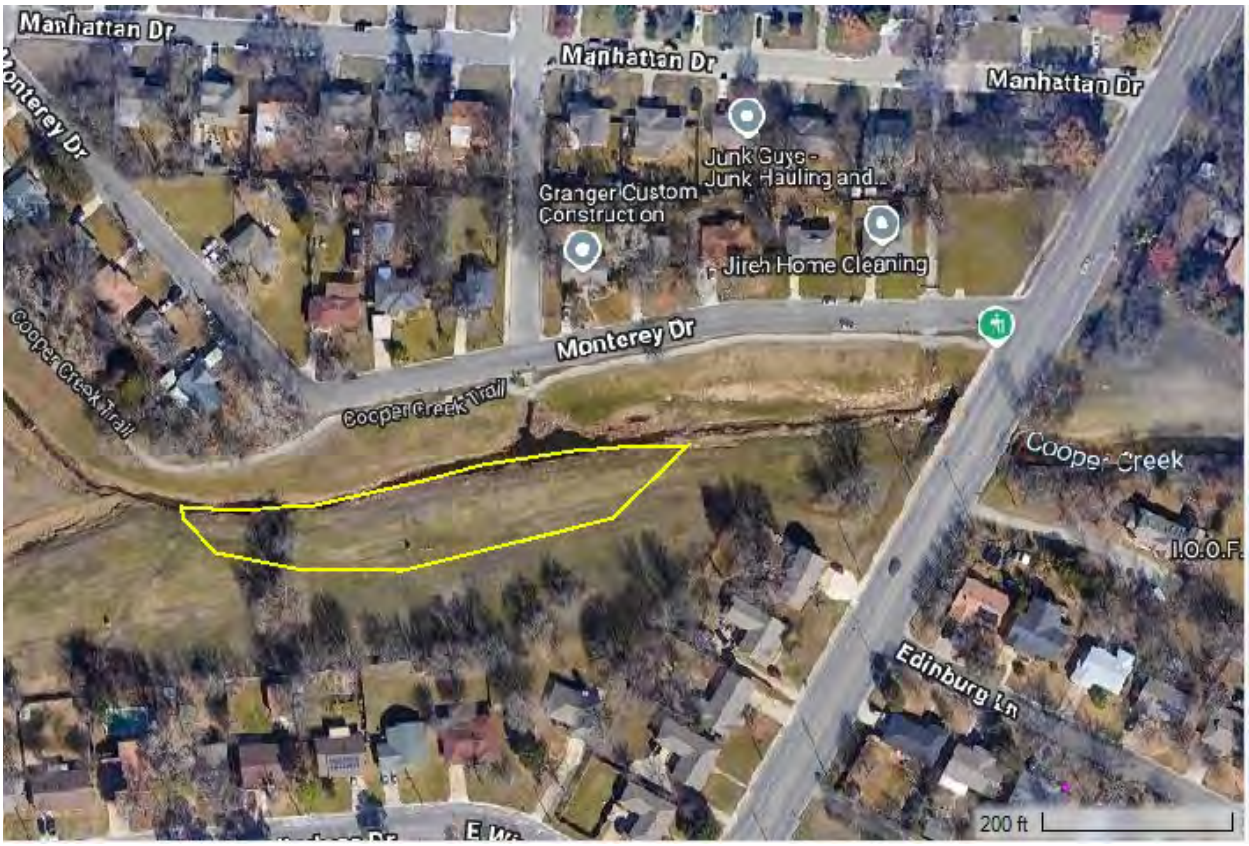

Figure 10 - Location of alternative 2A1

This alternative adds some floodwater storage capacity in the right overbank. 2A1 includes up to 6 feet of excavation in the right overbank. To minimize impacts on the environment, this alternative would use native grass plantings.

2B (2C1) Detention above Stuart Road, elevation 637 feet): This alternative seeks to utilize a large area of undeveloped land upstream of Stuart Road. This area is not owned by the City of Denton and would result in more environmental impacts due to existing trees, however this area has a significant amount of volume that could be used for floodwater storage. Figure 11 shows the location of alternative 2C1.

Figure 11 - Location of alternative 2C1

About 9 acres of land would be excavated to elevation 637 feet and result in an average excavation depth of 7 feet (Total excavation volume is 106,000 cubic yards). The alternative would include an earthen weir approximately 850 feet in length cut to an elevation of 640.5 feet which would optimize the flood storage of the peak of flood hydrograph. The elevation could be increased or decreased to focus flood shaving for different events, but the 25-year event was the event that was selected as a compromise between frequent flood events like the 10-year event and more infrequent flood events like the 100-year. The alternative also includes a pipe at the downstream end to drain the detention area. This detention alternative meets study objectives but also provides environmental benefits through creation of new fluvial floodplain area (Nature Based Solution) and native grass plantings.

2C (2D1) Detention above Stuart Rd, elevation 634 feet: This alternative is similar to 2C1 but has additional excavation depth, lower earthen weir elevation, and longer drainage pipe. This alternative seeks to utilize a large area of undeveloped land upstream of Stuart Rd. This area is not owned by the City of Denton and would result in more environmental impacts due to existing trees, however this area has a significant amount of volume that could be used for floodwater storage. Figure 12 shows the location of alternative 2D1.

Figure 12 - Location of alternative 2D1

About 9 acres of land would be excavated to elevation 634 feet and results in an average excavation depth of 10 feet (Total excavation volume is 151,000 cubic yards). The alternative would include an earthen weir approximately 850 feet in length cut to an elevation of 639.8 feet which would optimize the flood storage of the peak of flood hydrograph. The elevation could be increased or decreased to focus flood shaving for different events, but the 25-year event was the event that was selected as a compromise between frequent flood events like the 10-year event and more infrequent flood events like the 100-year. The alternative also includes a pipe at the downstream end to drain the detention area. This detention alternative meets study objectives but also provides environmental benefits through creation of new fluvial floodplain area (Nature Based Solution) and native grass plantings.

6.1.3. Alternative 3: (3A1) Detention (2C1) + channelization at Windsor Drive

This alternative includes the detention from alternative 2C1 and channelization around Windsor Rd. The channelization extent for this alternative was identified as the “NED Plan” in a previous USACE report titled “Cooper Creek, Denton Texas, Stage 2 Planning Draft Detailed Project Report” which was from a 1981 USACE CAP Section 205 study on Cooper Creek. Figure 13 shows the location of alternative 3A1.

Figure 13 - Location of alternative 3A1

In addition to the detention configuration described under alternative 2C1, channelization would be performed around Windsor Drive. The channelization includes approximately 850 feet of grass lined channel improvement with a bottom width of 30 feet and side slopes of 3 horizontal to 1 vertical. The total excavation amount for this alternative is 110,400 cubic yards. This detention alternative meets study objectives but also provides environmental benefits through creation of new fluvial floodplain area (Nature Based Solution) and native grass plantings.

6.1.4. Alternative 5: (5A1) Detention (2C1) and bridge improvements at Sherman Drive

This goal with this alternative is to reduce the water surface elevations through Cooper Creek by adding flood storage with detention (Configuration from alternative 2C1) and increasing the capacity through the Sherman drive bridge. The capacity increase is based on a configuration analyzed and costed during a 2009 study performed for the City of Denton by an engineering firm. Figure 14 shows the location of alternative 5A1.

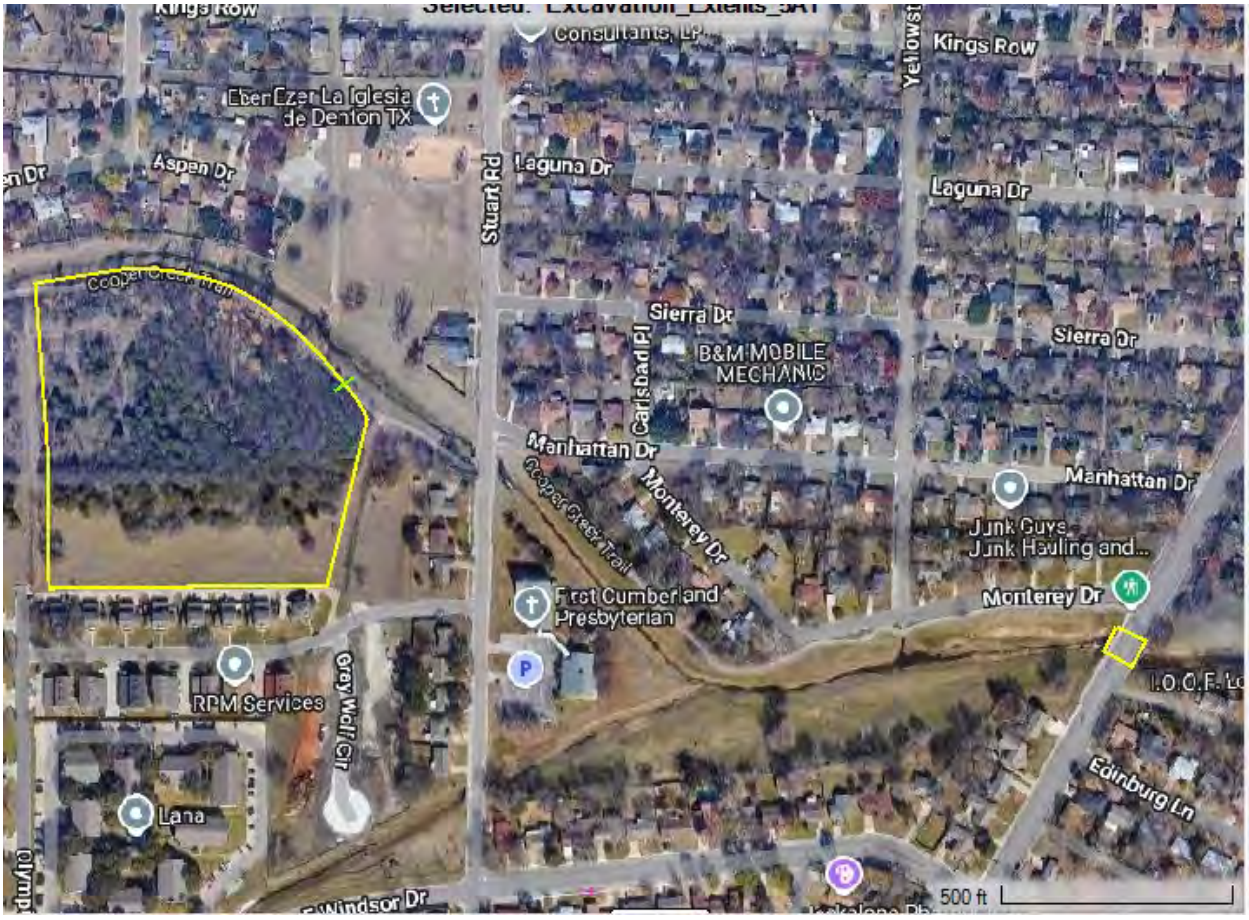

Figure 14 - Location of alternative 5A1

In addition to the detention configuration described under alternative 2C1, the Sherman Dr. crossing capacity would be increased from a single 30-foot clear span to 2 – 40 ft by 8 ft clear spans with a single 2 ft wide pier and vertical abutments. This provides a significant increase in flow area through the bridge (From 210 square feet to 640 square feet). Figure 15 provides an illustration of how the existing crossing compares to the proposed crossing from 5A1.

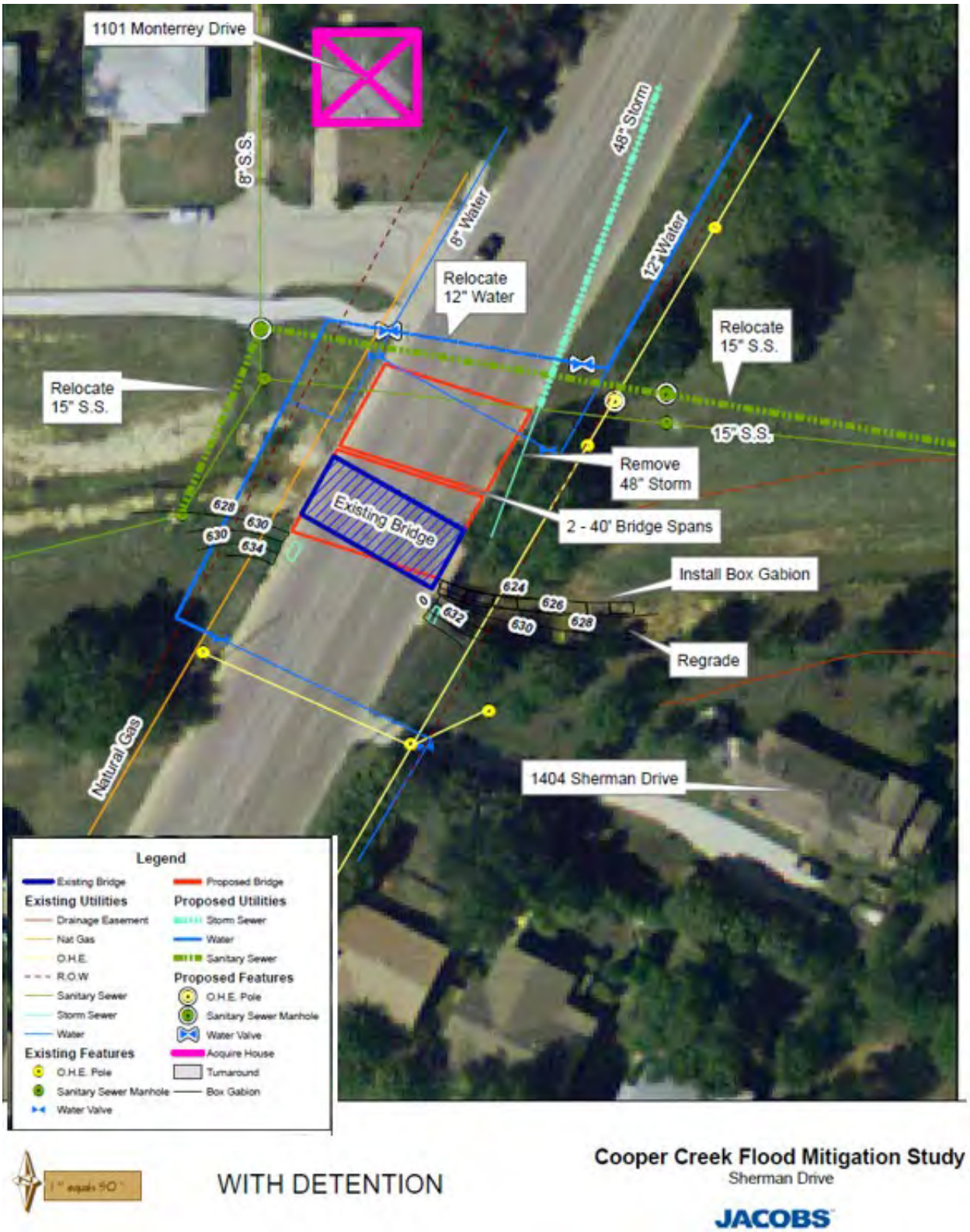

Figure 15 - Layout of proposed bridge improvements for alternative 5A1

6.1.5. Alternative 8: (8A1) Channelization and bridge improvement at Windsor Drive

The goal of this alternative is to reduce the water surface elevations through Cooper Creek by increasing the Cooper Creek channel capacity and crossing capacity at Windsor Dr. The channelization extent for this alternative was identified as the “National Economic Development (NED) Plan” in a previous USACE report titled “Cooper Creek, Denton Texas, Stage 2 Planning Draft Detailed Project Report” which was from a 1981 USACE CAP Section 205 study on Cooper Creek. Figure 16 shows the location of alternative 8A1.

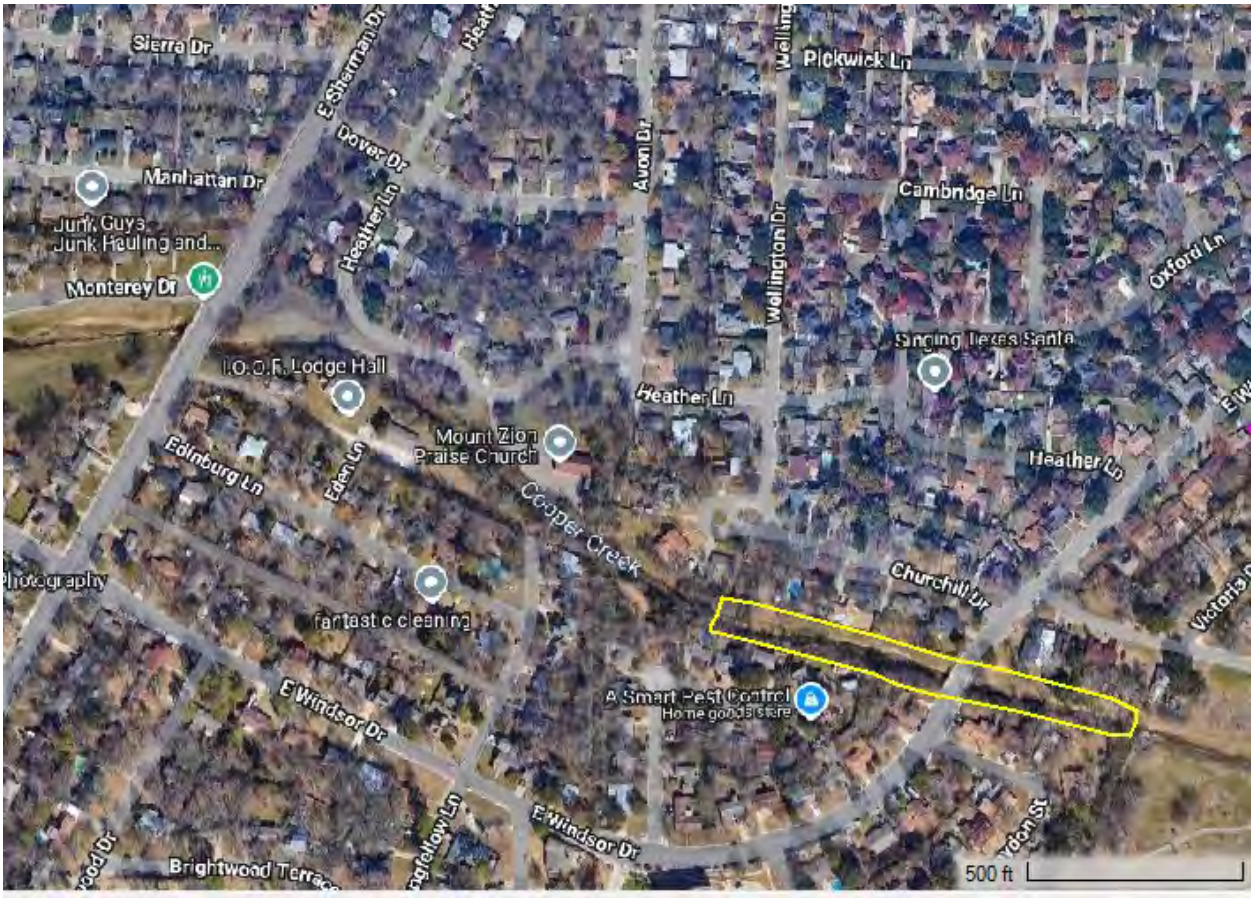

Figure 16 - Location of alternative 8A1

Channelization would be performed around Windsor Dr. The channelization includes approximately 850 feet of grass lined channel improvement with a bottom width of 30 feet and side slopes of 3 horizontal to 1 vertical. The crossing capacity would be increased from 4- 8 ft x 8 ft culverts to 4 – 8 ft x 8 ft culverts and 2 – 8 ft wide by 6 ft high culverts. It is assumed that that the 4 existing culverts would need to be demolished and replaced with 6 new culverts. The total excavation amount for this alternative is 4,400 cubic yards. To minimize impacts on the environment, this alternative would use native grass plantings.

6.1.6. Alternative 11: Buyouts Alone

Alternative 11 would consist of determining the structures in the impact area prone to damages with various AEP events and a complete purchase of properties at market value and demolition costs of removing structures within the impact area (Figure 17).

Figure 17 - Cooper Creek Impact Area Associated with Alternative 11 and Alternative 13

6.1.7. Alternative 13: Raising Structures in Place

This alternative would determine structures in the impact area are prone to flood damages with various AEP events and raising homes off foundation and placing support columns underneath to protect from flooding.

6.1.8. Alternative 17: (17A1) Detention (2C1)+bridge improvements(8A1)+channelization(8A1)

The goal with this alternative is to reduce the water surface elevations through Cooper Creek by adding flood storage with detention (Configuration from alternative 2C1) and increasing channel and crossing capacity along Cooper Creek and through Windsor Drive (8A1). Figure 18 shows the location of alternative 17A1.

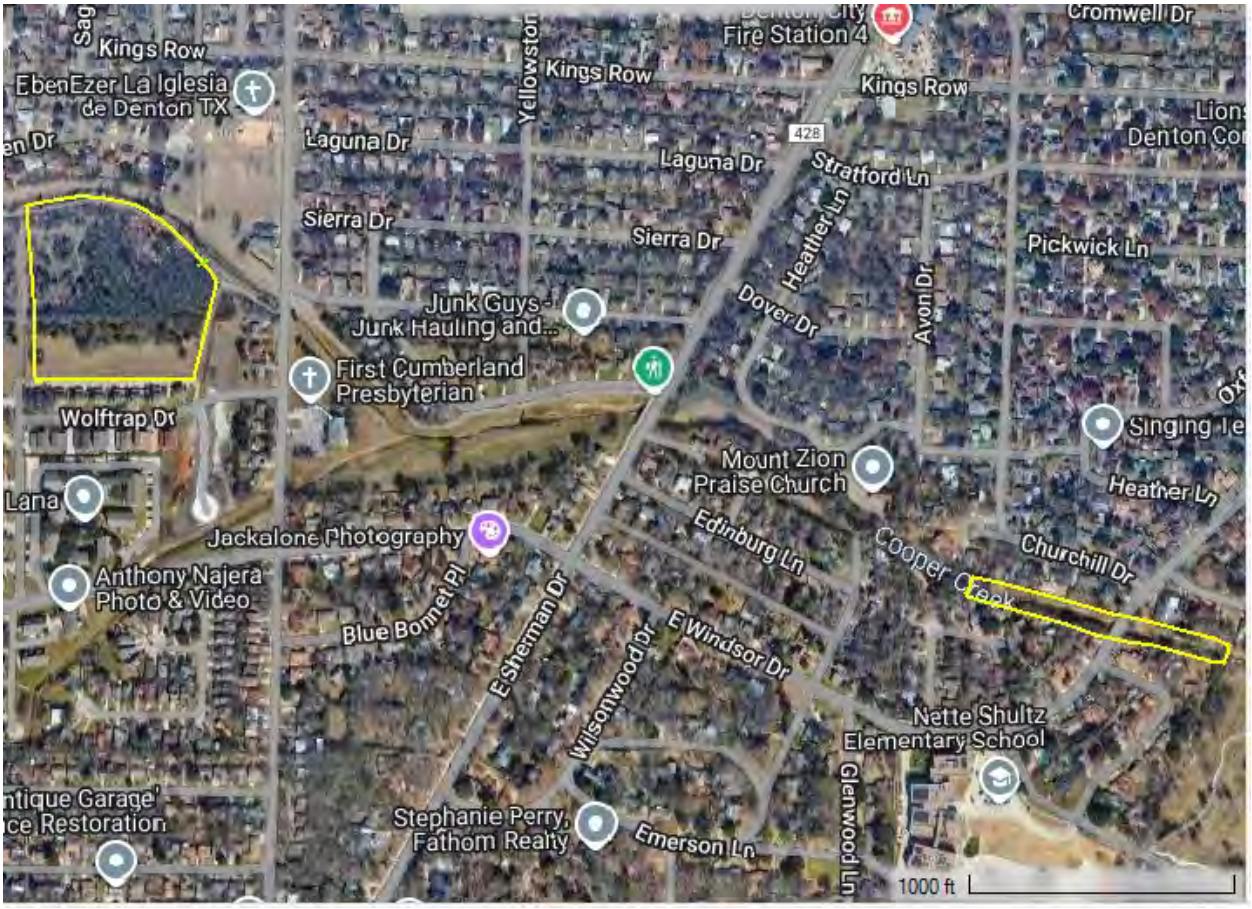

Figure 18 - Location of alternative 17A1

In addition to the detention configuration described under alternative 2C1, channelization would also be performed around Windsor Dr. The channelization includes approximately 850 feet of grass lined channel improvement with a bottom width of 30 feet and side slopes of 3 horizontal to 1 vertical. The crossing capacity would be increased from 4- 8 ft x 8 ft culverts to 4 – 8 ft x 8 ft culverts and 2 – 8 ft wide by 6 ft high culverts. The total excavation amount for this alternative is 110,400 cubic yards.

6.2. Costs of Final Array of Alternatives

The project costs for the alternatives in the final array are provided in Table 9 below.

Table 9 - Cooper Creek Alternative Costs (FY25 dollars)

Alternative	Project Cost
Alternative 1: No Action	$0
Alternative 2A (2A1): Detention above Sherman	$3,043,000

Alternative	Project Cost
Alternative 2B (2C1): Detention above Stuart (elevation 637)	$8,662,000
Alternative 2C (2D1): Detention above Stuart (elevation 634)	$10,112,000
Alternative 3: (3A1) Detention (2C1) + channelization at Windsor Drive	$9,194,000
Alternative 5 (5A1): Detention (2C1) + Bridge Improvements at Sherman Drive	$15,226,000
Alternative 8 (8A1): Channelization and bridge improvement at Windsor Dr.	$4,225,000
Alternative 11: Buyouts	(50YR) $55,781,000 (25YR) $39,308,000 (10YR) $22,881,000
Alternative 13: Raising Structures in Place	(50YR) $34,606,000 (25YR) $26,640,000 (10YR) $16,914,000
Alternative 17 (17A1): Detention (2C1) + bridge improvement (8A1) + channelization (8A1)	$10,608,000

6.3. Economic Analysis of Final Array of Alternatives

Once the PDT had developed project costs for the final array and economics analysis was performed (Table 10).

Table 10 - Cooper Creek Economic Analysis (FY25 dollars)

Alternative Costs					
	First Costs	**Annual Costs**	**Damages Reduced (Mean)**	**Net Benefits (Mean)**	**BCR (Mean)**
Alt 2A1	$3,043,000	$134,474	$12,874	($121,600)	0.10

Alternative Costs					
Alt 2C1	$8,662,000	$390,113	$301,202	($88,911)	0.77
Alt 2D1	$10,112,000	$455,417	$335,779	($119,638)	0.74
Alt 3A1	$9,194,000	$416,833	$335,778	($81,055)	0.81
Alt 5A1	$15,226,431	$1,587,349	$236,631	($1,350,718)	0.15
Alt 8A1	$4,225,000	$186,708	$85,595	($101,113)	0.46
Alt 17A1	$10,608,000	$486,580	$337,429	($149,151)	0.69
Elevation (50 YR)	$34,606,000	$1,540,667	$752,000	($788,667)	0.49
Elevation (25YR)	$26,460,000	$1,176,031	$679,055	($496,976)	0.58
Elevation (10 YR)	$16,914,000	$751,753	$542,000	($209,753)	0.72
Buyout (50 YR)	$55,781,254	$2,200,325	$752,000	($1,448,325)	0.34
Buyout (25 YR)	$39,307,987	$1,550,527	$679,055	($871,472)	0.44
Buyout (10 YR)	$22,880,759	$902,545	$542,000	($360,545)	0.60

6.4. National Criteria

The PDT utilized data collected from the study and economic analysis to perform an evaluation of the National Criteria (Table 11).

Table 11 - Cooper Creek National Criteria Evaluation

Alternative	Complete	Effective (Damages Reduced)	Efficient (Net Benefits)	Acceptable
Alternative 1: No Action	N/A	N/A	N/A	N/A
Alternative 2A (2A1): Detention above Sherman	YES	Least effective	No, ($121,600)	YES
Alternative 2B (2C1):Detention above Stuart (elevation 637)	YES	Effective	No, ($88,911)	YES, may require mitigation for proposed species
Alternative 2C (2D1): Detention above Stuart (elevation 634)	YES	Effective	No, ($119,638)	YES, may require mitigation for proposed species
Alternative 3: (3A1) Detention (2C1) + channelization at Windsor Drive	YES	Effective	No, ($81,055)	YES, may require mitigation for proposed species
Alternative 5 (5A1): Detention (2C1) + Bridge Improvements at Sherman Drive	YES	Less effective	No, ($1,350,718)	YES, may require mitigation for proposed species
Alternative 8 (8A1): Channelization and bridge improvement at Windsor Dr.	YES	Effective	No, ($101,113)	YES
Alternative 11: Buyouts (50YR, 25 YR and 10 YR)	YES	Most effective More effective More effective	No, ($1,448,325) No,($871,472) No, ($360,545)	YES
Alternative 13: Raising Structures in Place (50YR, 25YR, and 10YR)	YES	Most effective More effective More effective	No, ($788,667) No ($496,976) No,($209,753)	YES

Alternative	Complete	Effective (Damages Reduced)	Efficient (Net Benefits)	Acceptable
Alternative 17 (17A1): Detention (2C1) + bridge improvement (8A1) + channelization (8A1)	YES	Effective	No, ($149,151)	YES, may require mitigation for proposed species

*Damages reduced can be found in Table 10

6.5. Comprehensive Benefits Analysis

No action alternative was identified as having positive net benefits in the project area. There are no significant differences in the RED, EQ and OSE accounts, although any alternative with a detention basin above Stuart Road may need mitigation for the tri-colored bat (Table 12). Prior to TSP the team discovered that a portion (approximately 26%) of the project area did include an at risk community, based on recent updates to the CEJST tool. The team utilized this information to analyze the alternative with the highest BCR (Alternative 3) to determine if there were disproportionate impacts to the at risk community under the OSE account via indexing the property values within the at risk community. The results of this analysis did not provide sufficient benefits to allow the recommendation of an alternative action, raising the BCR from 0.81 to 0.91.

Table 12 - Cooper Creek Comprehensive Benefits Summary

Alternative	NED	RED	EQ	OSE
Alternative 1: No Action	N/A	N/A	N/A	N/A
Alternative 2A (2A1): Detention above Sherman	BCR=0.10	Temp benefits construction	None	Lower risk HHS
Alternative 2B (2C1):Detention above Stuart (elevation 637)	BCR=0.77	Temp benefits construction	May need mitigation	Lower risk HHS
Alternative 2C (2D1): Detention above Stuart (elevation 634)	BCR=0.74	Temp benefits construction	May need mitigation	Lower risk HHS
Alternative 3: (3A1) Detention (2C1) + channelization at Windsor Drive	BCR=0.81	Temp benefits construction	May need mitigation	Lower risk HHS
Alternative 5 (5A1): Detention (2C1) + channelization at Sherman Drive	BCR=0.15	Temp benefits construction	May need mitigation	Lower risk HHS

Alternative	NED	RED	EQ	OSE
Alternative 8 (8A1): Channelization and bridge improvement at Windsor Dr.	BCR=0.46	Temp benefits construction	None	Lower risk HHS
Alternative 11: Buyouts	BCR=0.34 BCR=0.44 BCR=0.60	Temp benefits construction	None	Lower risk HHS
Alternative 13: Raising Structures in Place	BCR=0.49 BCR=0.58 BCR=0.72	Temp benefits construction	None	Lower risk HHS
Alternative 17 (17A1): Detention (2C1) + bridge improvement (8A1) + channelization (8A1)	BCR=0.69	Temp benefits construction	May need mitigation	Lower risk HHS

*HHS = Human Health and Safety

7. TENTATIVELY SELECTED PLAN

The tentatively selected plan is no action. An analysis of the comprehensive benefits does not support any of the action alternatives.

8. CONCLUSION

Analysis of the data collected during this study indicates that the benefits provided by any of the action alternatives would not suffice to produce Federal interest to invest in the project. Therefore, the PDT recommends no action on Cooper Creek at this time.

9. RECOMMENDATIONS

In view of the conclusions set forth, and after considering the expected social, economic and environmental impacts the PDT recommends no Federal action be taken for Cooper Creek Flood Risk Management Section 205 and completion of a closeout report. The Fort Worth District review of existing data indicates no Federal interest exists for participation in a flood risk management project within the study area of Cooper Creek in Denton, Texas.

At the TSP milestone meeting, the decision maker agreed with the District's recommendation of the no action plan as the TSP for Cooper Creek, provided the following actions were taken: a. The PDT will complete a closeout report which documents the data and findings resulting from the study.; b. The PDT will perform a District Quality Control (DQC) review of the closeout report.; c. The PDT will provide the closeout report to the NFS.; d. The District will follow the feasibility study termination process in EP 1105-2-58.

Following coordination with affected non-Federal interests, City of Denton, the feasibility phase should be terminated if analyses indicate a lack of Federal interest or a lack of public support. The phase is officially terminated when the District Commander advises the MSC Commander and the appropriate HQ RIT of termination of the study. The CAP database must be updated to show project status as terminated, with the date and the reason why, and all future capability amounts will be reduced to zero. The District Commander will also notify the non-Federal interest, City of Denton, when the study has been officially terminated.

The recommendations contained herein reflect the information available at the time and current Department of the Army policies governing formulation, evaluation and development of individual projects under the US Army Corps of Engineers Continuing Authorities Program. It does not reflect program and budgeting priorities inherent in the formulation of a national Civil Works program nor the perspective of higher review levels within the Executive Branch.

11 MARCH 2025

DATE

CALVIN A. KROEGER
COL, EN
Commanding

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11. ACRONYMS

AEP	**Annual Exceedance Probability**
ASTM	American Society for Testing and Materials
BCR	Benefit Cost Ratio
BMP	Best Management Practices
CAP	Continuing Authorities Program
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CJEST	Climate and Economic Justice Screening Tool
CWA	Clean Water Act
dBA	Decibel
DNL	Day-Night average sound Level
EAD	Expected Annual Damage
EO	Executive Order
EPA	Environmental Protection Agency
ER	Engineering Regulation
FEMA	Federal Emergency Management Agency
FPPA	Farmland Protection Policy Act
FT/ft	Feet/Foot
GHG	Greenhouse Gases
HUC	Hydrologic Unit Code
HTRW	Hazardous, Toxic, Radioactive Waste
IPaC	Information for Planning and Consultation
NAAQS	National Ambient Air Quality Standards
NED	National Economic Development

NEPA	National Environmental Policy Act
NFS	Non-Federal Sponsor
NRCS	Natural Resources Conservation Service
NRHP	National Registry of Historic Places
O&M	Operation & Maintenance
PDT	Project Delivery Team
RCRA	Resource Conservation and Recovery Act
SSURGO	Soil Survey Geographic Database
TCB	Tri-Colored Bat
TCEQ	Texas Commission on Environmental Quality
TPWD	Texas Parks and Wildlife Department
tpy	Tons Per Year
U.S./US	United States
U.S.C	United States Code
USACE	U.S. Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Service

Appendix A: Cost Engineering

Cooper Creek, Denton, TX

Section 205

Closeout Report

February 2025

Appendix A

Cost Appendix

Project Goals and Objectives

The goal is to provide an economical flood control that can protect properties closer to Cooper Creek in the city of Denton. The objectives include reduce risk of flood induced damages in the vicinity of Cooper Creek over the 50-year period of analysis, reduce risk to human health and safety in the vicinity of Cooper Creek over the 50-year period of analysis, improve emergency response time in the vicinity of Cooper Creek over the 50-year period of analysis. The final array of structural alternatives is made of the following 6 alternatives:

- Alternative 1 – No Action
- Alternative 2 – Detention Basin alone
- Alternative 3 – Detention Basin and channel improvements
- Alternative 5 – Detention Basin and Bridge Culvert Modifications
- Alternative 8 – Channel Improvements and Bridge culvert modifications
- Alternative 17 – Detention Basin, Bridge culvert modifications, channel improvements.

The three Non-Structural alternatives are the followings:

- Non-Structural 25 year
- Non-Structural 15 year
- No Structural 10 year

Cost estimating activities have been developed to provide the cost of each alternatives needed to support Feasibility Studies.

Methodology

The PDT members provided all the quantities for all structural alternatives. The cost estimates were developed in accordance with the guidance contained in ER 1110-2-1302, Civil Works Cost Engineering, using the MCACES II V 4.4 software was used. This is the most current version of the MCACES software. The following libraries were used:

- 2023 Cost Book,
- National Labor Seattle 2022,
- Equipment 2022 Region 06.

Each of the six alternatives in the estimate are broken out based on the Civil Works Work Breakdown Structure (CWWBS). The Relocations CWWBS code was used for utilities.

Assumptions and Constraints

During construction, we assumed the selected prime and subcontractors after the bidding process are all operating in Denton, TX areas. All labors, materials, tools and equipment except long lead items or special equipment are sourced in the local construction market. We also assumed that the equipment is prime owned. All work will be done along Cooper Creek at specific alternative location. One overhead electrical pole was identified and needs relocation. The current estimate doesn't take into consideration the fees associated with the relocation. because the project is in a dense urban area, we anticipate that they will be local traffic constraints that need to be addressed.

Risks

An Abbreviated Risk Analysis meeting was held with all PDT members to access all Contingencies and uncertainty that may exist. The risks were determined by a collaboration of the PDT members and issues that may arise before and during construction. All risks for each alternative were based on available information and difficulty of the task. The computation of the contingency for each alternative was influenced by the known variables and their associated risk and they were incorporated in the Total Project Cost Summary. The Planning Engineering and Design contingency for each structural and no structural alternatives is 21%.

- The contingencies of all structural alternatives run from 15 to 26% .
- The contingencies of all non-structural alternative run from 15 to 30%

PROJECT: **XXXXXX**
PROJECT NO: **0**
LOCATION: **Cooper Creek**
This Estimate reflects the scope and schedule in report; Report Name and date

Civil Works Work Breakdown Structure

WBS NUMBER	Civil Works Feature & Sub-Feature Description	FULL ($K)
02	RELOCATIONS	$4,663.38
06	FISH & WILDLIFE FACILITIES	$76
08	ROADS, RAILROADS & BRIDGES	$4,588
09	CHANNELS & CANALS	$5,620
19	BUILDINGS, GROUNDS & UTILITIES	
	CONSTRUCTION ESTIMATE TOTALS:	$14,948
01	LANDS AND DAMAGES	$32
30	PLANNING, ENGINEERING & DESIGN	$460
31	CONSTRUCTION MANAGEMENT	$212
	PROJECT COST TOTALS:	$15,652
	Alt 2A1	
02	RELOCATIONS	$1,531
06	FISH & WILDLIFE FACILITIES	
08	ROADS, RAILROADS & BRIDGES	
09	CHANNELS & CANALS	
19	BUILDINGS, GROUNDS & UTILITIES	$322
	CONSTRUCTION ESTIMATE TOTALS:	$1,852
01	LANDS AND DAMAGES	$32
30	PLANNING, ENGINEERING & DESIGN	$460
31	CONSTRUCTION MANAGEMENT	$212
	CONTRACT COST TOTALS:	**$2,557**
	Alt 2D1	
02	RELOCATIONS	$288
06	FISH & WILDLIFE FACILITIES	$38

08	ROADS, RAILROADS & BRIDGES	
09	CHANNELS & CANALS	
19	BUILDINGS, GROUNDS & UTILITIES	$7,873
	CONSTRUCTION ESTIMATE TOTALS:	$8,199
01	LANDS AND DAMAGES	$677
30	PLANNING, ENGINEERING & DESIGN	$2,426
31	CONSTRUCTION MANAGEMENT	$1,148
	CONTRACT COST TOTALS:	**$12,450**

v **Alt 3A1**

02	RELOCATIONS	$237
06	FISH & WILDLIFE FACILITIES	
08	ROADS, RAILROADS & BRIDGES	
09	CHANNELS & CANALS	$5,397
19	BUILDINGS, GROUNDS & UTILITIES	$2,271
	CONSTRUCTION ESTIMATE TOTALS:	$7,906
01	LANDS AND DAMAGES	$32
30	PLANNING, ENGINEERING & DESIGN	$2,394
31	CONSTRUCTION MANAGEMENT	$1,134
	CONTRACT COST TOTALS:	**$11,465**

v **Alt 5A1**

02	RELOCATIONS	$1,118
06	FISH & WILDLIFE FACILITIES	
08	ROADS, RAILROADS & BRIDGES	$2,943
09	CHANNELS & CANALS	
19	BUILDINGS, GROUNDS & UTILITIES	$6,939
	CONSTRUCTION ESTIMATE TOTALS:	$11,001
01	LANDS AND DAMAGES	$32
30	PLANNING, ENGINEERING & DESIGN	$3,190
31	CONSTRUCTION MANAGEMENT	$1,516
	CONTRACT COST TOTALS:	**$15,739**

v **Alt 8A1**

02	RELOCATIONS	$560
06	FISH & WILDLIFE FACILITIES	
08	ROADS, RAILROADS & BRIDGES	$823
09	CHANNELS & CANALS	$223
19	BUILDINGS, GROUNDS & UTILITIES	
	CONSTRUCTION ESTIMATE TOTALS:	$1,606
01	LANDS AND DAMAGES	$1,531
30	PLANNING, ENGINEERING & DESIGN	$475
31	CONSTRUCTION MANAGEMENT	$220
	CONTRACT COST TOTALS:	**$3,832**

v **Alt 17A1**

02	RELOCATIONS	$579
06	FISH & WILDLIFE FACILITIES	
08	ROADS, RAILROADS & BRIDGES	$823
09	CHANNELS & CANALS	
19	BUILDINGS, GROUNDS & UTILITIES	$7,087
	CONSTRUCTION ESTIMATE TOTALS:	$8,488
01	LANDS AND DAMAGES	$2,208
30	PLANNING, ENGINEERING & DESIGN	$2,529
31	CONSTRUCTION MANAGEMENT	$1,204
	CONTRACT COST TOTALS:	**$14,429**

v **Non-Structural 50 yr**

02	RELOCATIONS	$15,794
06	FISH & WILDLIFE FACILITIES	
08	ROADS, RAILROADS & BRIDGES	

09	CHANNELS & CANALS	
19	BUILDINGS, GROUNDS & UTILITIES	
	CONSTRUCTION ESTIMATE TOTALS:	$15,794
01	LANDS AND DAMAGES	$37,876
30	PLANNING, ENGINEERING & DESIGN	$2,529
31	CONSTRUCTION MANAGEMENT	$1,204
	CONTRACT COST TOTALS:	**$57,403**

v **Non-Structural 25 yr**

02	RELOCATIONS	$11,116
06	FISH & WILDLIFE FACILITIES	
08	ROADS, RAILROADS & BRIDGES	
09	CHANNELS & CANALS	
19	BUILDINGS, GROUNDS & UTILITIES	
	CONSTRUCTION ESTIMATE TOTALS:	$11,116
01	LANDS AND DAMAGES	$25,630
30	PLANNING, ENGINEERING & DESIGN	$2,529
31	CONSTRUCTION MANAGEMENT	$1,204
	CONTRACT COST TOTALS:	**$40,479**

v **Non-Structural 10 yr**

02	RELOCATIONS	$5,948
06	FISH & WILDLIFE FACILITIES	
08	ROADS, RAILROADS & BRIDGES	
09	CHANNELS & CANALS	
19	BUILDINGS, GROUNDS & UTILITIES	
	CONSTRUCTION ESTIMATE TOTALS:	$5,948
01	LANDS AND DAMAGES	$13,897
30	PLANNING, ENGINEERING & DESIGN	$2,529
31	CONSTRUCTION MANAGEMENT	$1,204
	CONTRACT COST TOTALS:	**$23,578**

v		**Non-Structural Raising 50 yr**	
	02	RELOCATIONS	$18,639
	06	FISH & WILDLIFE FACILITIES	
	08	ROADS, RAILROADS & BRIDGES	
	09	CHANNELS & CANALS	
	19	BUILDINGS, GROUNDS & UTILITIES	
		CONSTRUCTION ESTIMATE TOTALS:	$18,639
	01	LANDS AND DAMAGES	
	30	PLANNING, ENGINEERING & DESIGN	$2,529
	31	CONSTRUCTION MANAGEMENT	$1,204
		CONTRACT COST TOTALS:	**$22,372**
v		**Non-Structural Raising 25 yr**	
	02	RELOCATIONS	$13,119
	06	FISH & WILDLIFE FACILITIES	
	08	ROADS, RAILROADS & BRIDGES	
	09	CHANNELS & CANALS	
	19	BUILDINGS, GROUNDS & UTILITIES	
		CONSTRUCTION ESTIMATE TOTALS:	$13,119
	01	LANDS AND DAMAGES	
	30	PLANNING, ENGINEERING & DESIGN	$2,529
	31	CONSTRUCTION MANAGEMENT	$1,204
		CONTRACT COST TOTALS:	**$16,852**
v		**Non-Structural Raising 10 yr**	
	02	RELOCATIONS	$11,000
	06	FISH & WILDLIFE FACILITIES	
	08	ROADS, RAILROADS & BRIDGES	
	09	CHANNELS & CANALS	
	19	BUILDINGS, GROUNDS & UTILITIES	
		CONSTRUCTION ESTIMATE TOTALS:	$11,000
	01	LANDS AND DAMAGES	

30	PLANNING, ENGINEERING & DESIGN	$2,529
31	CONSTRUCTION MANAGEMENT	$1,204
	CONTRACT COST TOTALS:	**$14,733**

Appendix B: Environmental

Cooper Creek, Denton, TX

Section 205

Closeout Report

February 2025

3. EXISTING CONDITIONS

This chapter presents a description of the environmental resources and baseline conditions that could be affected from implementing the proposed alternative in accordance with the National Environmental Policy Act (NEPA) (42 U.S. Code [USC] 4321 et seq.) and its implementing regulations published by the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] §§1500 - 1508), and the Civil Works Program of the USACE's NEPA regulation (33 CFR 230) and associated implementation guidance (ER 200-2-2). The level of detail used in describing a resource is commensurate with the anticipated level of potential environmental impact. The project study area occurs along Cooper Creek which flows through the City of Denton, Texas. Cooper Creek is located in central Denton County, which is in the northcentral portion of the state (Figure 1). Cooper Creek runs through a developed area of Denton, Texas. Recurrent flooding of Cooper Creek induces damages to adjacent properties, increases risk to human health and safety, and inundates roadways resulting in road closures, traffic delays and increased emergency response times. At least one known fatality has been attributed to flood waters from Cooper Creek. In addition, high flow events are contributing to erosion downstream of Avondale Park with the channel encroaching on residential lots and fence lines.

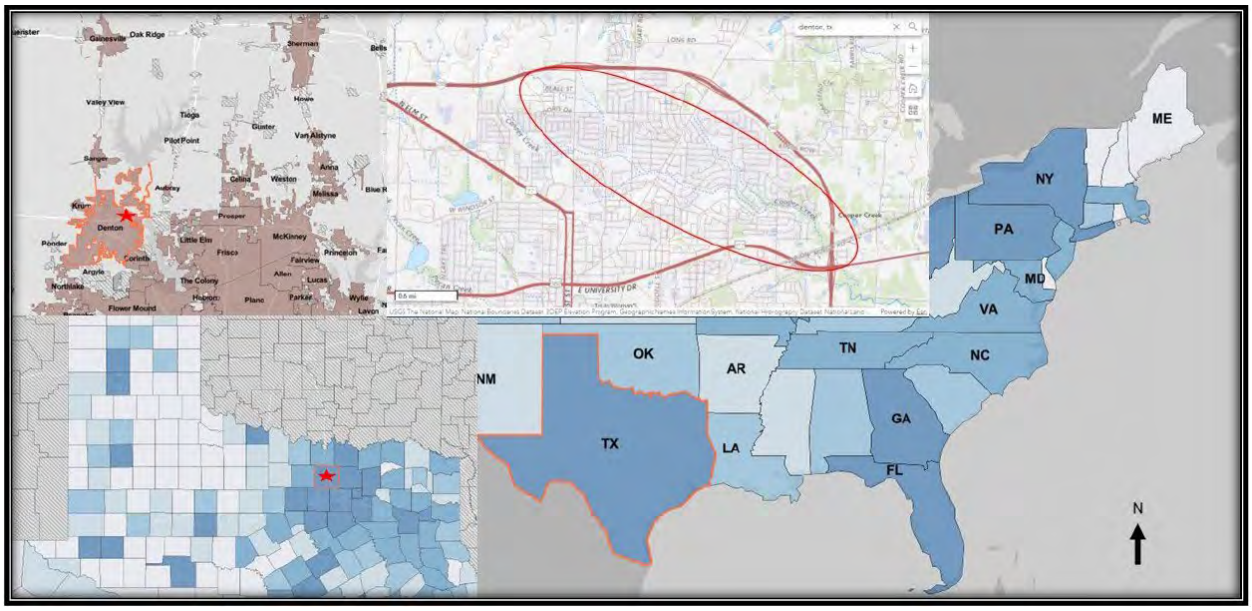

Figure 1. Project Study Area Map

3.1. Climate

The climate of the study area is humid subtropical with warm to hot summers and mild winters. The average annual high temperature is about 76 degrees Fahrenheit, with an average summer high of about 96 degrees for the months of June, July, and August, and an average annual winter low temperature of 54 degrees. Periods of freezing temperatures are infrequent and rainfall averages about 38 inches annually (U.S. Climate, 2024). Severe weather occurs periodically in the form of severe thunderstorms, tornadoes, flood-producing extreme precipitation events, and occasional winter ice storm (Runkle et al, 2022).

3.2. Geology

The project area is in a region known as the Eastern Cross Timbers Ecoregion. This region extends southward from the Red River through eastern Denton County and along the boundary between Dallas and Tarrant counties. It then stretches through Johnson County to the Brazos River and into Hill County (Butler, 2022). The region includes rolling hills, cuestas, and ridges. Soils within the Cross Timbers are mostly sandy, loamy, and are underlain by sand, shale, clay, sandstone, calcareous shale, and limestone. Today, livestock farming is the main land use, but some cropland also occurs (TPWD-A 2024). The City of Denton sits on top of the Grayson Marl rock formation. Grayson Marl, mostly marl, is light-greenish-gray to medium-gray, weathers to grayish-yellow. Thickness of Grayson Marl in Texas is between 15 and 60 feet (USGS, 2024).

3.3. Soils

The Farmland Protection Policy Act (FPPA) (Public Law 97-98, Title XV, Subtitle I, Section 1539-1549 requires federal actions to minimize unnecessary and irreversible conversion of farmland to nonagricultural uses, specifically prime farmlands. The Act defines prime farmlands as "…land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion…" The Natural Resources Conservation Service (NRCS) is responsible for designating soils as prime farmland soils.

The project area consists of a variety of ground cover types with the majority consisting of disturbed soils covered by urban development as the City of Denton has grown around the banks of Cooper Creek. The proposed footprint of the project does not include land or soil suitable for agricultural activities. Based on the Soil Survey of Denton County, Texas (Soil Conservation Service, 1988), soils surrounding the project area are classified in the Sanger and Wilson-Urban land complex soil series, which are classified as a clayey and well-drained soils weathered from claystone with low slopes (Figure 2). According to Soil Survey Geographic Database (SSURGO) information acquired from the Natural Resources Conservation Service (NRCS 2024), soils within the Sanger and Wilson-Urban series are not considered prime farmlands (Soil Survey Staff, 2024).

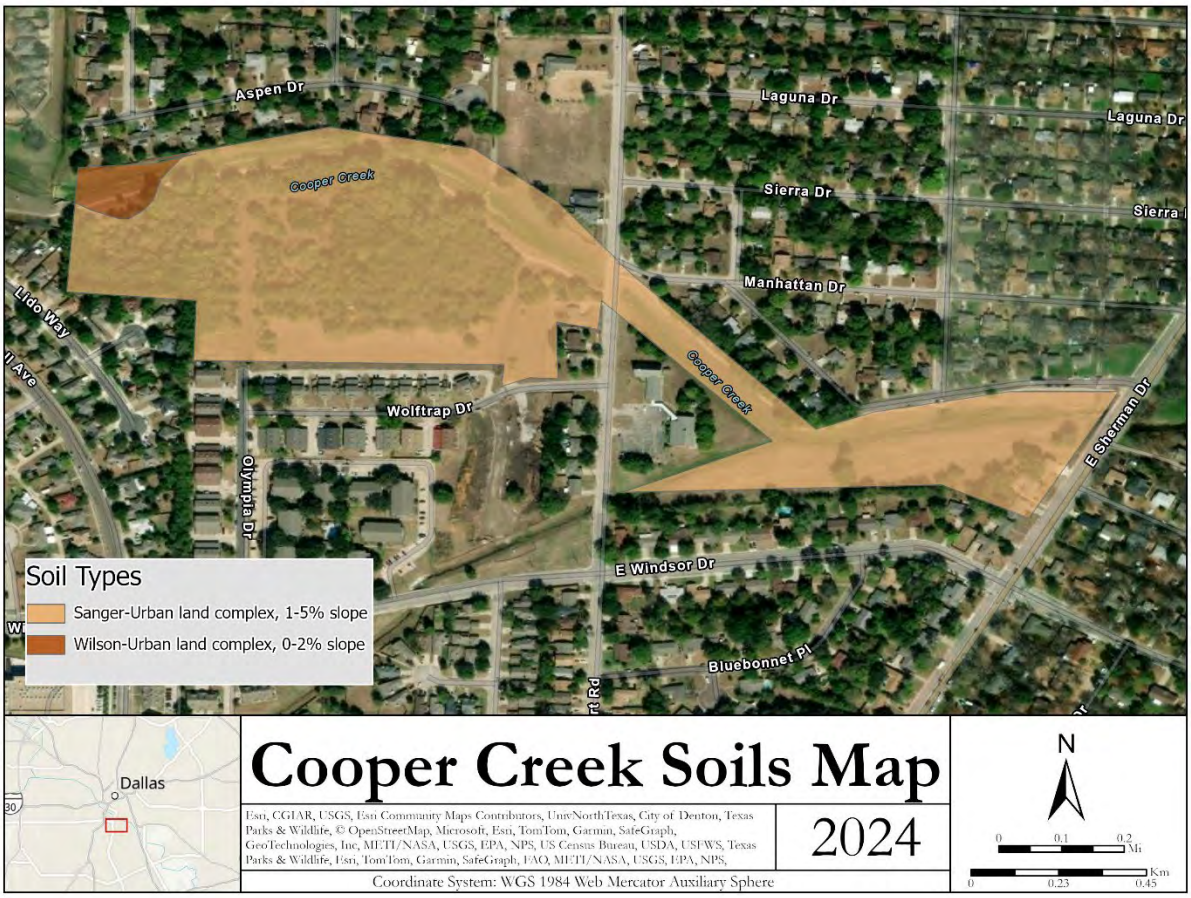

Figure 3. Cooper Creek Soils Map

3.4. Surface Water

Cooper Creek lies in the Elm Fork Trinity Watershed (HUC 12030103). Streams in this watershed vary from slow, meandering streams flowing to smaller, riffle and pool types in the smaller watersheds. Cooper Creek is a 6.3-mile long tributary to the Trinity River which eventually leads into Lewisville Lake.

The project area consists of a shallow stream about 10 feet wide. Flow through the site is generally slow moving and perennial. Despite erosion occurring in the area, turbidity is low and the water clarity is good. The stream bed is composed of some clays and silts towards the center of the channel, while red clays are found along the shoreline and at the East Sherman Drive bridge.

3.5. Floodplains

The project area is classified as Zone AE Regulatory Floodway on the Federal Emergency Management Flood Insurance Rate Map as part of the Denton County Unincorporated Areas (48121C0360G) (Figure 4). Immediately in the project area, floodplain characteristics are restricted on either side by residential housing communities (FEMA 2023).

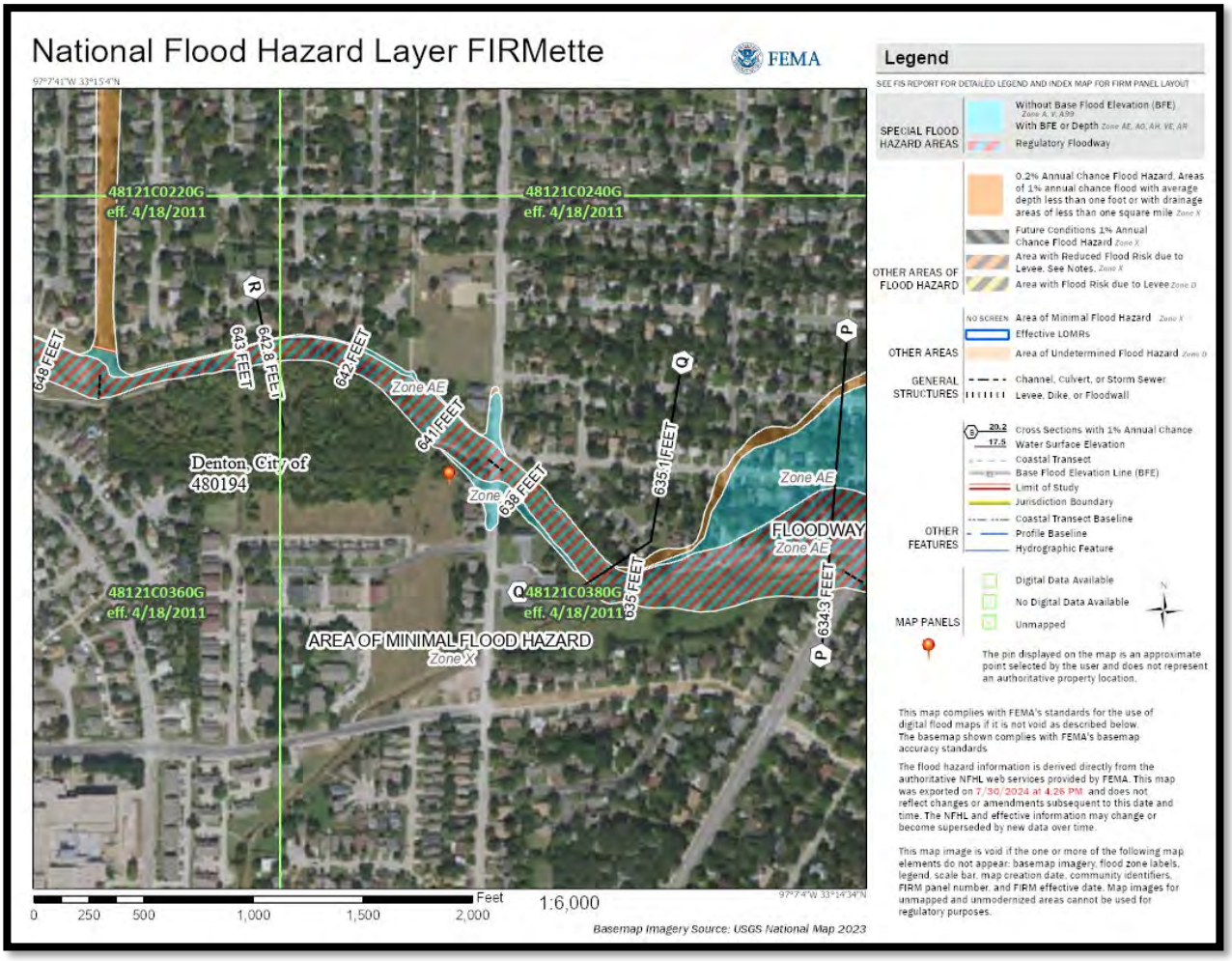

Figure 4. FEMA Flood Insurance Rate Map for the Project Area

3.6. Water Quality

Regional water quality is influenced by lithology, soil composition and land use activities. In Denton County, rugged upland areas have been cleared for urban use. Community housing, businesses, and recreation are important land uses. Cooper Creek is part of the Upper Elm Fork Trinity Watershed. Water quality in the Trinity River Basin is generally good while average

stream gradients and dissolved oxygen levels are typically lower than waters in the lower basin, whereas turbidity, total suspended solids, total organic carbon, total phosphorus and biochemical oxygen demand values are typically higher (TWDB, 2024).

Section 303(d) of the Clean Water Act (CWA) requires states to identify waters where existing pollution controls are not stringent enough to achieve state water quality standards and establish a priority ranking of these waters. The Texas Commission on Environmental Quality is responsible for assessing water quality monitoring data and developing a 303(d) list every two years in accordance with the CWA. The Texas Draft 2024 303(d) List represents the most recent evaluation of water quality data. Cooper Creek itself is not listed as an impaired waterbody for any appraised metrics. There are no waterbodies upstream of Cooper Creek that would contribute to the understanding of its water quality (TCEQ, 2024).

3.7. Wetlands

Wetlands are often defined as areas where the frequent and prolonged presence of water at or near the soil surface drives the natural system including the type of soils (i.e. hydric soils) that form, the plants that grow and the fish and/or wildlife that use the habitat. A review of the National Wetlands Invintory database shows that the existing project footprint (Figure 5) covers approximately 27.3 acres with 1.1 acres occurring within Freshwater Forested/Shrub Wetland and 5 acres of that occurring in Riverine wetlands.

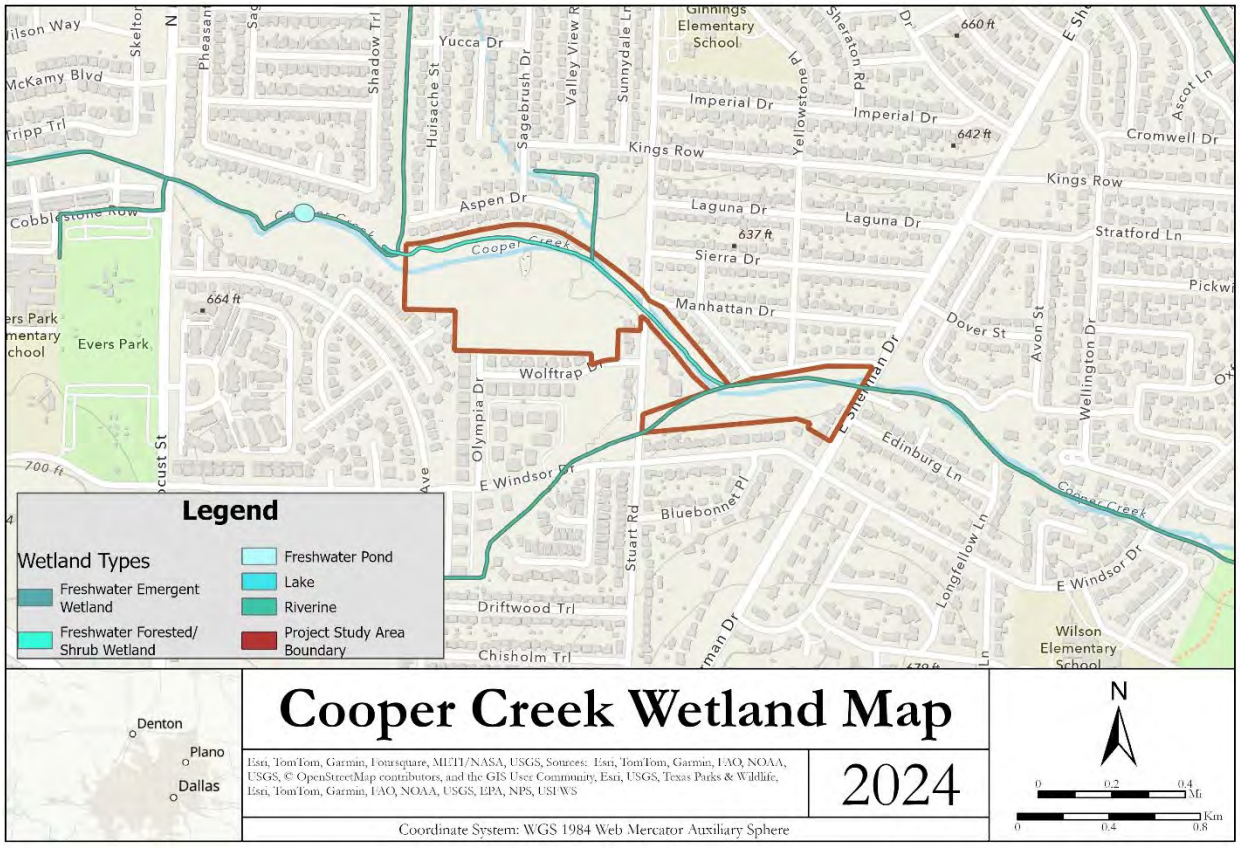

Figure 5: Cooper Creek Wetland Map

3.8. Biological Resources

3.8.1. Vegetation

The project study area is located within the Cross Timbers and Prairies ecoregion, which covers the upper center portion of the state of Texas. Grassland species such as little bluestem, Indiangrass and big bluestem are common. Texas mulberry, American elm and Osage orange are more common here than they were to the east. In the west, live oak becomes more important, replacing the post oak of the east. Decreasing moisture discourages clusters of trees, and trees form isolated stands. Flameleaf sumac, redbud, Mexican plum and Eastern red cedar become more prevalent. Wildlife is a mixture of eastern forest and prairie species.

3.6.3. Aquatic Resources

Cooper Creek has habitat conditions that can support many species of fish and invertebrates (Table 1). Fish communities characteristically in the area include a sunfish and minnow-dominated community along with darters and occasional catfishes and an assemblage of macroinvertebrates. No protected or sensitive species are known to occur in the creek.

Table 1. Aquatic species potentially occurring in the project area.

Common Name	Scientific Name
Microcaddisfly	*Paucicalcaria ozarkensis*
Nearctic Paduniellan Caddisfly	*Paduniella nearctica*
Mayfly	*Paraleptophlebia calcarica*
Elevated Spring Amphipod	*Stygobromus elatus*
Boston Mountains Crayfish	*Cambarus causeyi*
Alabama Shad	*Alosa alabamae*
White perch	*Pomoxis annularis*
Pyramid Pigtoe	*Pleurobema rubrum*
Purple Lilliput	*Toxolasma lividum*
Isopod	*Lirceus bicuspidatus*
Queen Snake	*Regina septemvittata*
Alligator Gar	*Atractosteus spatula*
American Eel	*Anguilla rostrata*

3.8.2. Wildlife

Considerable urban growth and expansion throughout the area surrounding Cooper Creek has caused local wildlife to become fragmented. Cooper Creek serves as a green corridor that provides ample habitat for several common species of birds and mammals. Table 2 provides a partial list of common bird and mammal species known to occur in areas near the project area that may use the project area for foraging, nesting, resting, or migration.

Table 2. Common Wildlife Species in the Vicinity of the Project Area

Common Name	Scientific Name	Common Name	Scientific Name
Birds			
Black vulture	*Coragyps atratus*	Ring-neck duck	*Aythya collaris*
Blue jay	*Cyanocitta cristata*	Wood duck	*Aix sponsa*
Cardinal	*Cardinalis*	Mockingbird	*Mimus polyglottos*
Common yellowthroat	*Geothlypis trichas*	Mourning dove	*Zenaida macroura*
Eastern phoebe	*Sayornis phoebe*	Robin	*Turdus migratorius*
Eastern wood-pewee	*Contopus virens*	Turkey vulture	*Cathartes aura*
Great horned owl	*Bubo virginianus*	Red-tailed hawk	*Buteo jamaicensis*
Mammals			
Little brown bat	*Myotis lucifugus*	Opossum	*Didelphis virginiana*
Eastern gray squirrel	*Sciurus carolinensis*	Raccoon	*Procyon lotor*
White-tailed deer	*Odocoileus virginianus*	Nine-banded armadillo	*Dasypus novemcinctus*
Eastern cottontail	*Sylvilagus floridanus*	Eastern chipmunk	*Tamias striatus*
Woodchuck	*Marmota monax*	Beaver	*Castor canadensis*
Striped skunk	*Mephitis*	Bobcat	*Felis rufus*

3.9. Threatened and Endangered Species

The USFWS Information for Planning and Consultation (IPaC) tool was utilized to determine species listed under the Endangered Species Act that may occur in or near the Cooper Creek study area (USFWS, 2024). A total of five Federally threatened or endangered species and one candidate species were identified; however, the project area only contains suitable habitat for one species (Table 3). No Federally designated critical habitat for any of the listed species is present in the action area. The bald eagle has been delisted but the protections provided by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act remain in effect.

Table 3. Federally Listed Species identified on the IPaC

Species Name	Status	Habitat Description	Suitable Habitat in the Action Area
Mammals			
Tricolored Bat *Perimyotis subflavus*	PE	Summer habitat: wide variety of forested/wooded habitats for roosting. Roost among leaves of live or recently dead deciduous hardwood trees, but may also be found in Spanish moss, pine trees, and occasionally manmade structures. Winter habitat (hibernacula): caves or abandoned mines.	Summer Habitat: Yes Winter Habitat: No
Birds			
Whooping crane *Grus americana*	E	Dense marshes and wetlands with nest sites found primarily located in shallow diatom ponds that contain bulrush. During migration, whooping cranes use a variety of habitats; however wetland mosaics appear to be the most suitable.	No -Urban area with sparse forested riparian area lacking wetlands/marshes
Piping plover *Charadrius melodus*	T	Coastal shorelines and open mudflats and sandy areas.	No- Open areas around the creek are grassy and disturbed. Lack sandy areas.
Rufa red knot *Calidris canutus rufa*	T	Wintering and migration habitats are muddy or sandy coastal areas, specifically, bays and estuaries, tidal flats, and unimproved tidal inlets with sand spits, islets, shoals, and sandbars	No - shorelines are urbanized and surrounded by patches of Riparian Forest
Reptiles			
Alligator snapping turtle *Macrochelys temminckii*	PT	Freshwater rivers and lakes with deep floors.	No – generally too shallow
Insects			
Monarch butterfly *Danaus plexippus*	C	Monarchs need healthy and abundant milkweed embedded within diverse nectaring habitat. Many monarchs use a variety of roosting trees along the fall migration route. Although monarch butterfly can occur within the project areas, they will not be affected by construction due to the lack of milkweed presence and unlikelihood of milkweed to occur in the sites due to the regular mowing of the grassy areas adjacent to Cooper Creek.	No – grassy riparian area with potential for host plant is regularly disturbed and mowed.

E= Endangered T= Threatened PE= Proposed Endangered PT= Proposed Threatened C= Candidate

Source: U.S. Fish and Wildlife Service IPAC website and Arkansas Ecological Service Office database.

3.10. Recreational Resources

Occasional fishing, hiking or wildlife watching may occur immediately along the creek; however, the creek is bordered on all sides by private land making other recreational activities unavailable due to restricted land access.

3.11. Socioeconomics

Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly population, demographics, and economic development. Demographics entail population characteristics and include data pertaining to race, gender, income, housing, poverty status, and educational attainment. Economic development or activity typically includes employment, wages, business patterns, an area's industrial base, and its economic growth.

The socio-economic characteristics of Denton, Texas, the nearest town located near the project study area are presented in Table 4. The City of Denton had a population of 158,349 living in 52,000 households in 2022. The racial makeup of the city was 67.8 percent White, 11.5 percent African American, 0.8 percent Native American, 3.5 percent Asian, 0.0 percent other, and 11.1 percent from two or more races. Of the total population, 24.1 percent were of Hispanic or Latino origin. Roughly 15.7 percent of families in the city live below the poverty line (U.S. Census Bureau, 2022).

Table 4. Population Data for Denton, Texas

Population Metric	Denton, Texas
Total Population	158,349
Total Households	52,000
White	67.8%
Black or African American	11.5%
Native American or Alaska Native	0.8%
Asian	3.5%
Native Hawaiian or Other Pacific Islander	0.0%
Other Race	0.0%
Two or More Races	11.1%
Hispanic	24.1%
Under 5 years	4.9%
5 to 19 years	18.5%
20 to 64 years	64.4%
Over 64 years	12.2%
High School Diploma	91.5%
Bachelor's Degree or Higher	40.0%
Median Household Income	$71,717

3.12. Incorporating the Needs and Considerations of All at Risk Communities

An analysis using the Climate and Economic Justice Screening Tool (CEJST) was conducted to identify at risk communities in or near the project area (Figure 6). The tool identifies at risk communities if they are in a census tract that meets the thresholds for at least one of the tool's categories of burden, or if they are on land within the boundaries of Federally Recognized Tribes. The CEJST showed that a portion of the area surrounding the project area was classified as being at risk. Categories that were found to exceed the socioeconomic threshold included Climate Change (Projected wildfire risk and low income), energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development. All of these metrics were found to fall within the "low income" category.

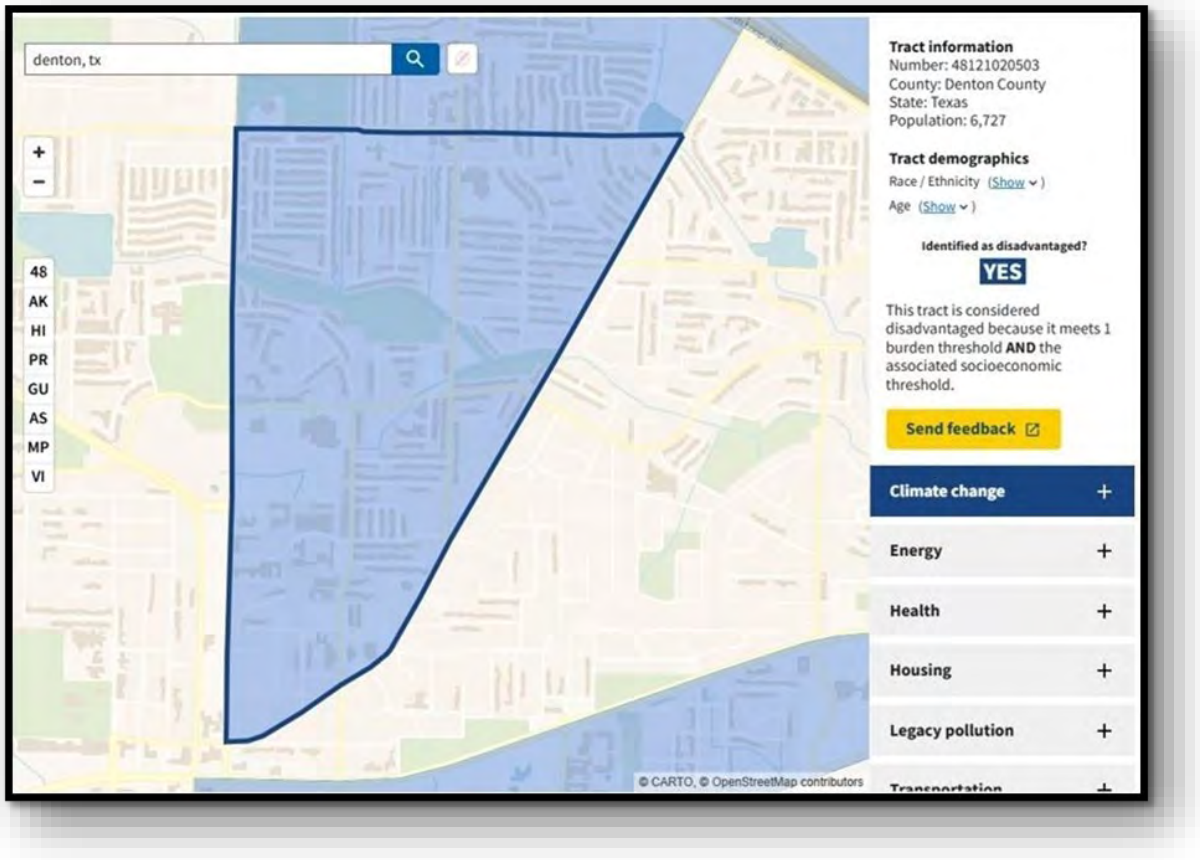

Figure 6. Climate and Economic Justice Screening Tool Results for the Cooper Creek Project Area.

3.13. Noise

Federal and local governments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise. The Federal Interagency Committee on Urban Noise developed land-use compatibility guidelines for noise in terms of day-night average sound level (DNL). It is recommended that no residential uses, such as homes, multifamily dwellings, dormitories, hotels, and mobile home parks, be located where the noise is expected to exceed a DNL of 65 decibels (dBA). For outdoor activities, the EPA recommends DNL of 55 dBA as the sound level below which there is no reason to suspect that the general population would be at risk from any of the effects of noise (EPA, 1974). Noise-sensitive receptors are facilities or areas where excessive noise may disrupt normal activity, cause annoyance, or loss of business. Land uses such as residential, religious, educational, recreational, and medical facilities are more sensitive to increased noise levels than are commercial and industrial land uses.

Review of the project area show that it is in an urban area comprised of residential homes and businesses. There would be temporary noise disturbance from construction associated with the project.

3.14. Air Quality

The U.S. Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality nationwide. The Clean Air Act (42 U.S.C. 7401 et seq.), as amended, requires the EPA to set National Ambient Air Quality Standards (NAAQS) for wide-spread pollutants from numerous and diverse sources considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards classified as either “primary” or “secondary.” Primary standards set limits to protect public health, including the health of at-risk populations such as people with pre-existing heart or lung diseases (such as asthma), children, and older adults. Secondary standards set limits to protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings.

EPA has set NAAQS for six principal pollutants, which are called “criteria” pollutants. These criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO2), ozone (O3), particulate matter less than 10 microns (PM10), particulate matter less than 2.5 microns (PM2.5), sulfur dioxide (SO2) and lead (Pb). If the concentration of one or more criteria pollutant in a geographic area is found to exceed the regulated “threshold” level for one or more of the NAAQS, the area may be classified as a non-attainment area. Areas with concentrations of criteria pollutants that are below the levels established by the NAAQS are considered either attainment or unclassifiable areas.

The project area is located within Denton County, Texas and is part of an area designated as Nonattainment, meaning concentrations of criteria pollutants are above the levels established by the NAAQS (EPA 2024). Due to the area’s NAAQS Nonattainment status, a General Conformity determination will be required.

3.15. Hazardous, Toxic, and Radioactive Waste (HTRW)

No Recognized Environmental Conditions were identified within one mile of the project area that could be reasonably expected to affect the Cooper Creek CAP 205 project. Although not classified as HTRW under USACE regulations, several oil and gas infrastructure sites were identified within the surrounding area. As a result of these findings, pipelines and wells within the project vicinity and along potential site access routes should be precisely located during PED to ensure no unintended interaction occurs with the existing oil and gas facilities.

Despite the lack of identified sites that could be reasonably expected to affect the project, there is always a possibility that previously unidentified HTRW could be uncovered, even when a proposed project is entirely within a preexisting project footprint. An updated HTRW survey will be required should the project be reconsidered and funded at a future time. Additionally, care should be taken to identify and address HTRW concerns that may arise in a timely manner, so as not to affect proposed project timelines.

3.16. Cultural Resources

The study area is located on the southern plains in north Texas in the City of Denton along Cooper Creek. The study area is heavily developed for residential and commercial use and the banks and channel of Copper Creek have been modified to control erosion. There are numerous cultural resources recorded within this region that include National Register of Historic Places (NRHP) listed properties, archeological sites, cemeteries, and historical markers. A preliminary assessment of the cultural resources within one kilometer of the proposed study area was conducted using a desktop review of the databases maintained by the Texas Historical Commission and the Texas Archeological Research Laboratory for cultural resources as well as a review of historic aerial imagery. This assessment identified one previously recorded cultural resource, the Fairhaven Retirement Home, a NRHP listed property, approximately 950 meters from the proposed study area. There are no other previously recorded cultural resources.

Only two previous archeological surveys are within one kilometer of the study area. Both surveys were conducted in 1993 for the Federal Highway Administration along United States (U.S.) Highway 77 and North Locust Street. While there have been numerous cultural resource investigations conducted in the surrounding region, there are no other previous investigations in the proposed study area or within one kilometer.

The primary considerations concerning cultural resources are threats to buried archeological deposits because of earthmoving activities. However, most of the study area has been developed for residential and commercial use. The soils within the study area are mapped as Sanger-Urban land complex and Wilson-Urban land complex, both clayey soils originating from alluvium from weathered slopes and bedrock. Although the area has not been previously investigated, the residential and commercial development and the presence of urban soils in the study area suggest that the probability for intact archeological sites to occur in this area is low.

4. Environmental Consequences

This section describes the natural and human environments that exist at the project and the potential impacts of the No Action Alternative (Alternative 1) and the action alternatives, as required under NEPA.

Impacts (consequences or effects) can be either beneficial or adverse and can be either directly related to the action or indirectly caused by the action. Direct effects are caused by the action and occur at the same time and place (40 CFR § 1508.8 [a]). Indirect effects are caused by the action and are later in time or further removed in distance but are still reasonably foreseeable (40 CFR § 1508.8 [b]). As discussed in this section, the alternatives may create temporary (less than one year), short-term (up to three years), long-term (three to ten years), or permanent impacts following the implementation of the Recommended Plan.

Whether an impact is significant depends on the context in which the impact occurs and the intensity of the impact (40 CFR § 1508.27). The context refers to the setting in which the impact occurs and may include society as a whole, the affected region, the affected interests, and the locality. Impacts on each resource can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. For the purpose of this analysis, the intensity of impacts would be classified as negligible, minor, moderate, or major. The intensity thresholds are defined as follows:

- Negligible: A resource would not be affected or the effects would be at or below the level of detection, and changes would not be of any measurable or perceptible consequence.
- Minor: Effects on a resource would be detectable, although the effects would be localized, small, and of little consequence to the sustainability of the resource. Mitigation measures, if needed to offset adverse effects, would be simple and achievable.
- Moderate: Effects on a resource would be readily detectable, long-term, localized, and measurable. Mitigation measures, if needed to offset adverse effects, would be extensive and likely achievable.
- Major: Effects on a resource would be obvious and long-term and would have substantial consequences on a regional scale. Mitigation measures to offset the adverse effects would be required and extensive, and success of the mitigation measures would not be guaranteed.

4.1. Future Without Project Conditions – No Action Alternative

If No Action is taken to address flooding along Cooper Creek, the most likely future condition of the area is as follows:

- Recurrent flooding of Cooper Creek will continue to cause damages to adjacent properties.

- Increased risk to human health and safety as a result of inundated roadways, road closures, traffic delays, and increased emergency vehicle response times.
- Under the No Action Alternative, physical and Biological Resources are expected to remain the same as described in the Existing Conditions Section of this report.
- If no Federal action is taken at Cooper Creek, the streambank will continue to erode downstream of Avondale Park and cause encroachments on residential lots and fence lines.

4.2. Future With Project Conditions

4.2.1 Climate

The project encompasses a relatively small area when compared to the global scale. Therefore, any changes with respect to incorporating changing conditions resulting from each alternative would be negligible.

At the state level, Greenhouse Gasses (GHGs) are a regulated pollutant under the Prevention of Serious Degradation program when emissions exceed thresholds. The threshold for new source emissions is the project emissions are above the major source threshold for a regulated pollutant that is not GHGs and will emit or have the potential to emit 75,000 tons per year (tpy) or more CO2e.

Construction activities associated with each alternative would generate GHG emissions because of combustion of fossil fuels while operating on- and off-road mobile sources. The primary GHGs generated during construction are CO2, CH4, and N2O. The other GHGs such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are typically associated with specific industrial sources and processes and would not be emitted during construction.

After construction is complete, all GHG emissions would cease, and the area would return to baseline conditions. Overall, the total direct and indirect adverse impacts would be constrained to very small increases in GHG emissions to the atmosphere from operation of on- and off-road mobile sources.

4.2.2 Geology

4.2.2.1 Alternative 2 Detention Basin Alone

Construction activities associated with Alternative 2 would be shallow in nature and have insignificant effect on the local geology. Alternative 2 would have no impact on the local geology.

4.2.2.2 Alternatives 3, 5, 8, and 17 Detention Basin and Channel Improvements

Construction activity effects associated with Alternative 3, 5, 8, and 17 would be the same as those for Alternative 2.

4.2.3 Soils

4.2.3.1 Alternative 2 Detention Basin Alone

Disturbances to soil would primarily be from removal of upland trees and the excavation of soil from backhoe operation to meet detention basin specifications. Soils would be temporarily

exposed to erosion during construction before being planted with native grasses. Best management practices would be put in place to reduce erosion and prevent downstream sedimentation until exposed soils are set in place with native plantings.

All construction activities will be limited to the south easements along Cooper Creek and north of the houses along Wolftrap Drive, which would not typically be a desirable location for farming and would be unavailable for farming. No impacts to prime farmland are expected.

4.2.3.2 Alternative 3 Detention Basin and Channel Improvements

Disturbances to soils under Alternative 3 would be similar in scope as those mentioned in section 4.2.1.2. In addition, disturbances to soil because of channel improvements would be primarily caused by backhoe operations to widen and straighten the channel. Soils would be temporarily exposed to erosion during construction before being seeded with native grasses. Best management practices would be put in place to reduce erosion and prevent downstream sedimentation until exposed soils are set in place with native plantings. No impacts to prime farmland are expected.

4.2.3.3 Alternative 5 Detention Basin and Bridge Culvert Modifications

Disturbances to soils under Alternative 5 would be like those mentioned in section 4.2.1.2.

4.2.3.4 Alternative 8 Channel Improvements and Bridge Culvert Modifications

Disturbances to soils under Alternative 8 would be like those mentioned in section 4.2.1.2.

4.2.3.5 Alternative 17 Detention Basin, Bridge Culvert Modifications, Channel Improvements

Disturbances to soils under Alternative 17 would be like those mentioned in section 4.2.1.2.

4.2.4 Surface Water

4.2.4.1 Alternative 2 Detention Basin Alone

Construction activities associated with Alternative 2 would have temporary direct and indirect impacts to water quality by causing an increase in river turbidity. This would have further indirect effects for a short distance downstream until the sediment is diluted. Temporary, minor adverse effects on surface water are expected during construction but will cease once construction of the project is complete.

4.2.4.2 Alternative 3 Detention Basin and Channel Improvements

Effects to surface water quality under Alternative 3 would be like those listed under section 4.2.4.1.

4.2.4.3 Alternative 5 Detention Basin and Bridge Culvert Modifications

Effects to surface water quality under Alternative 5 would be like those listed under section 4.2.4.1.

4.2.4.4 Alternative 8 Channel Improvements and Bridge Culvert Modifications

Effects to surface water quality under Alternative 8 would be like those listed under section 4.2.4.1.

4.2.4.5 Alternative 17 Detention Basin, Bridge Culvert Modifications, Channel Improvements

Effects to surface water quality under Alternative 17 would be like those listed under section 4.2.4.1.

4.2.5 Floodplains

4.2.5.1 Alternative 2 Detention Basin Alone

Consistent with Executive Order 11988, Floodplain Management, locating Alternative 2 in the floodplain would be the only practicable alternative. Alternative 2 would not increase the base flood elevation to a level that would violate applicable floodplain regulations or ordinances, nor does it degrade the natural floodplain characteristics of the project area. Adding the detention area will minimize overbank flooding that is experienced under the existing condition. Minor beneficial impacts to floodplains are expected.

4.2.5.2 Alternative 3 Detention Basin and Channel Improvements

Consistent with Executive Order 11988, Floodplain Management, locating Alternative 3 in the floodplain would be the only practicable alternative. Alternative 3 would not increase the base flood elevation to a level that would violate applicable floodplain regulations or ordinances, nor does it degrade the natural floodplain characteristics of the project area. Improving the channel will promote more efficient water flow along Cooper Creek and minimize overbank flooding that is experienced under the existing condition. Minor beneficial impacts to floodplains are expected.

4.2.5.3 Alternative 5 Detention Basin and Bridge Culvert Modifications

Effects to floodplains under Alternative 5 would be like those mentioned in section 4.2.6.2.

4.2.5.4 Alternative 8 Channel Improvements and Bridge Culvert Modifications

Effects to floodplains under Alternative 8 would be like those mentioned in section 4.2.6.2.

4.2.5.5 Alternative 17 Detention Basin, Bridge Culvert Modifications, Channel Improvements

Effects to floodplains under Alternative 17 would be like those mentioned in section 4.2.6.2.

4.2.6 Water Quality

4.2.6.1 Alternative 2 Detention Basin Alone

Temporary localized adverse effects are expected from construction activities occurring in the creek as described in section 4.2.4.1; however, turbidity conditions would return to baseline conditions after construction is complete. Minor effects to water quality are expected.

4.2.6.2 Alternative 3 Detention Basin and Channel Improvements

Temporary localized adverse effects are expected from construction activities occurring in the creek as described in section 4.2.4.1; however, turbidity conditions would return to baseline conditions after construction is complete. Best management practices will be used to stabilize the bank during construction. Stabilizing the bank would allow improved water quality by slowing or eliminating the amount of siltation and debris that sloughs into waters from storm runoff or high swift moving waters and reduce turbidity. Improving the water quality within the study area would most likely benefit the surrounding watershed. Minor, long-term beneficial effects to water quality are expected.

4.2.6.3 Alternative 5 Detention Basin and Bridge Culvert Modifications

Effects to water quality under Alternative 5 would be like those mentioned in section 4.2.5.1.

4.2.6.4 Alternative 8 Channel Improvements and Bridge Culvert Modifications

Effects to water quality under Alternative 8 would be like those mentioned in section 4.2.5.2.

4.2.6.5 Alternative 17 Detention Basin, Bridge Culvert Modifications, Channel Improvements

Effects to water quality under Alternative 17 would be like those mentioned in section 4.2.5.2.

4.2.7 Wetlands

Consistent with Executive Order 11990, Protection of Wetlands, the construction of any of the Alternatives would not contribute to the loss, destruction, or degradation of wetlands. The only wetlands within the project area are riverine and they would not be altered as minimal to no vegetation will be removed and the change in water flow would be beneficial as described in other sections. No impacts to wetlands are expected.

4.2.8 Biological Resources

4.2.8.1 Alternative 2 Detention Basin Alone

Stream bank preparation would be required during implementation of Alternative 2. Construction involves the removal of trees and some soil removal or relocation. Any species utilizing the trees would have to seek other foraging, nesting, or resting habitat in the area; however, there are sufficient trees of similar size and species in the immediate area that the loss should not contribute to the injury or mortality of individuals. Noise and other disturbances associated with construction would also temporarily adversely impact terrestrial species utilizing wildlife habitats adjacent to the project site and cause individuals to avoid the area until construction is complete.

4.2.8.2 Alternative 3 Detention Basin and Channel Improvements

Stream bank preparation would be required during implementation of Alternative 3. Construction involves the removal of trees and some soil removal or relocation. Any species utilizing the trees would have to seek other foraging, nesting, or resting habitat in the area; however, there are

sufficient trees of similar size and species in the immediate area that the loss should not contribute to the injury or mortality of individuals. Noise and other disturbances associated with construction would also temporarily adversely impact terrestrial species utilizing wildlife habitats adjacent to the project site and cause individuals to avoid the area until construction is complete.

Aquatic organisms presently utilizing shoreline or near shore habitats adjacent to the project site would be temporarily displaced. Since the desired outcome of the project would be to alter local hydraulics of the creek, the aquatic species adapted to the present hydraulic regime of Cooper Creek, or near the project site, would be adversely impacted through changes in aquatic habitat. Aquatic organisms would also likely encounter temporary impacts from vibrations and noise caused by construction equipment and from activities caused by personnel on site.

4.2.8.3 Alternative 5 Detention Basin and Bridge Culvert Modifications

Effects to biological resources under Alternative 5 would be like those mentioned in section 4.2.8.2.

4.2.8.4 Alternative 8 Channel Improvements and Bridge Culvert Modifications

Effects to biological resources under Alternative 8 would be like those mentioned in section 4.2.8.2.

4.2.8.5 Alternative 17 Detention Basin, Bridge Culvert Modifications, Channel Improvements

Effects to biological resources under Alternative 17 would be like those mentioned in section 4.2.8.2.

4.2.9 Threatened and Endangered Species

4.2.9.1 Alternative 2 Detention Basin Alone

Using the IPaC Consultation Package Builder and the Evaluate Determination Keys tools, the USACE determined that the activities related to the construction and implementation of Alternative 2 would have “No Effect” on Whooping crane, Piping plover, and Rufa red knot. These species were shown to not have suitable habitat within or around the project area. The USFWS will need to issue a consistency determination letter for these species on “20 November 2024”, confirming the “No Effect” determination (Need to Consult). A “no effect” determination was also made for alligator snapping turtle and Monarch butterfly based on lack of suitable habitat as described in Table A.

For tri-colored bat, a "May effect, not likely to adversely affect” determination was made due to suitable habitat being present and the potential for species to occur near the project area. Since the project involves the removal of approximately 9 acres of trees, the loss of habitat would be minor, but would have the potential to impact any nesting individuals in the project area. Guidance provided by the Texas Fish and Wildlife Ecological Services Office states that the effect determination for the Northern long-eared bat can guide the effect determination for Tricolored bat (TCB) but suggests conservation measures and best management practices (BMPs) to minimize the impacts to the species. Those recommendations have also been incorporated into the project for TCB and include: limiting tree removal and construction to the

winter months while bats are at their hibernacula, when possible, or outside the pupping season ((May 15 – July 31) if work cannot be done during the winter months. Additionally, best management practices such as checking trees for cavities that the bats could use for shelter before removing them, and working with the local Fish and Wildlife office if any bats are encountered will be utilized if work occurs outside the winter months. Consultation with the US Fish and Wildlife Service is necessary.

Table x. Effect Determinations for Listed Species

Species	Status	Effect Determination
Mammals		
Tricolored bat	PE	May effect, not likely to adversely affect.
Birds		
Whooping crane	E	No effect
Piping plover	T	No effect
Rufa red knot	T	No effect
Reptiles		
Alligator snapping turtle	PT	No effect
Insects		
Monarch butterfly	C	No effect

4.2.9.2 Alternative 3 Detention Basin and Channel Improvements

Effects to Threatened and Endangered species under Alternative 3 would be like those mentioned in section 4.2.9.1.

4.2.9.3 Alternative 5 Detention Basin and Bridge Culvert Modifications

Effects to Threatened and Endangered species under Alternative 5 would be like those mentioned in section 4.2.9.1.

4.2.9.4 Alternative 8 Channel Improvements and Bridge Culvert Modifications

Based upon the analysis of each species described in Table A, USACE had determined that Alternative 8 would have No effect for the tri-colored bat, Monarch butterfly, Whooping crane, Piping plover, Rufa red knot, and Alligator snapping turtle, due to lack of habitat occurring in the project area.

4.2.9.5 Alternative 17 Detention Basin, Bridge Culvert Modifications, Channel Improvements

Effects to Threatened and Endangered species under Alternative 14 would be like those mentioned in section 4.2.9.1.

4.2.10 Recreational Resources

Recreation Resources near the project area will temporarily be limited during construction activities. These resources are expected to become available again once construction is

completed. No other impacts to Recreational Resources are expected to occur as a result of each alternative.

4.2.11 Noise

Negligible effects from noise are expected for each alternative from heavy machinery during construction. However, adjacent residential areas are expected to hear construction noises but would not be of a decibel that would cause harm. Best management practices would be used to reduce the effects of noise to the surrounding area.

4.2.12 Air Quality

Construction activities associated with each alternative are expected to have only short-term impacts on local air quality. Such impacts would be primarily caused by increased emissions of carbon monoxide, hydrocarbons, and nitrous oxides from vehicles entering and exiting the site along with the operation of necessary equipment. Vehicle travel along unpaved road surfaces and excavation of bare ground surfaces would create fugitive dust emissions. In addition to fugitive dust, project construction activities would generate tailpipe emissions from mobile heavy equipment and increased vehicular traffic. In a regional context, the daily equipment emissions associated with project construction and O&M activities, even during maximum-intensity work periods, would be minor and temporary. Impacts on air quality would not be significant.

4.2.13 Hazardous, Toxic, and Radioactive Waste (HTRW)

Based on the findings of the HTRW survey, the probability of encountering contaminated sites or toxic substances without project construction is considered low. If construction will occur more investigation may be necessary to determine the status and location of underground storage tanks and other possible HTRW within the construction footprint.

4.2.14 Cultural Resources

4.2.15 Alternative 2 Detention Basin Alone

The proposed detention basin is located in the floodplain and mapped as Sanger-Urban land complex. These soils typically mixed, poorly developed clayey soils that have been disturbed by previous construction activities. The proposed detention basin has not been previously investigated for cultural resources and there are no previously recorded cultural resources identified within the footprint. Additionally, there are no standing structures or buildings within the footprint. The project area is surrounded by residential houses that are all less than 50 years

old and will not be directly impacted. Due to the nature of the soils within the proposed detention area, there is a low probability for intact cultural resources. The USACE has determined that Alternative 2 will have no effect upon historic properties.

4.2.16 Alternative 3 Detention Basin and Channel Improvements

The proposed detention basin is located in the floodplain and mapped as Sanger-Urban land complex. These soils typically mixed, poorly developed clayey soils that have been disturbed by previous construction activities. The proposed detention basin has not been previously investigated for cultural resources and there are no previously recorded cultural resources identified within the footprint. There are no standing structures or buildings within the footprint. The project area is surrounded by residential houses that are all less than 50 years old and will not be directly impacted. Due to the nature of the soils within the proposed detention area, there is a low probability for intact cultural resources. The channel of Cooper Creek has been previously modified to stabilize the banks and therefore, there is a low probability to encounter intact cultural resources. The USACE has determined that Alternative 3 will have no effect upon historic properties.

4.2.17 Alternative 5 Detention Basin and Bridge Culvert Modifications

Effects from the proposed detention basin under Alternative 5 would be like those mentioned in section 4.2.12.1. This alternative proposes replacing the Sherman Road bridge and a concrete culvert at Windsor Road where they cross Cooper Creek. The Sherman Road bridge was originally constructed in 1921 and reconstructed in 1960 to expand the bridge to four traffic lanes. The bridge is a reinforced concrete T-beam bridge and has not been evaluated for eligibility for inclusion in the NRHP.

The Windsor Road culvert is a concrete culvert constructed in 1970 and under this alternative would be expanded. The culvert has not been evaluated for eligibility for inclusion in the NRHP and is not located within a historic district. However, the ACHP’s Program Comment Issued for Streamlining Section 106 Review for Actions Affecting Post-1945 Concrete and Steel Bridges (Federal Register Volume 77, Number 222, pages 68790-68795) relieves the Federal Highway Administration and other federal agencies of consideration of effects of undertakings on common concrete and steel bridges and culverts constructed after 1945 as long as they aren’t in historic districts or previously determined eligible. The USACE has determined that there is a potential to affect the Sherman Road bridge and that the bridge should be evaluated for NRHP eligibility prior to construction.

4.2.18 Alternative 8 Channel Improvements and Bridge Culvert Modifications

Effects under Alternative 8 would be like those mentioned in sections 8.6.2 and 8.6.3.

4.2.19 Alternative 17 Detention Basin, Bridge Culvert Modifications, Channel Improvements

Effects under Alternative 17 would be like those mentioned in sections 8.6.2 and 8.6.3.

4.2.20 Best Management Practices

Final project designs and specifications will use measures to avoid and minimize impacts to natural and cultural resources. The following is a list of measures that may be used to mitigate impacts to natural and cultural resources from construction activities:

- Construction Site Planning and Management including
    - Stormwater Pollution Prevention Plans
    - Noise controls and set construction times of operations
    - Erosion, Runoff and Sediment Controls
    - Good Housekeeping and Materials Management
    - Higher Tiered heavy equipment use
    - Project equipment and vehicles transiting between the either the staging/laydown areas or to the construction/restoration sites will be minimized to the extent practicable, including but not limited to using designated routes and confining vehicle access to the immediate needs of the project.
    - An endangered species protection plan will identify personnel from contractor staff who will act as the single point of contact responsible for daily communicating and reporting endangered species issues throughout the construction period to the USACE biologist and contracting officer representative/lead engineer.
    - Construction boundaries will be clearly marked both with biodegradable flagging and within CADD drawings of awarded contract(s).
    - Use of construction lighting at night shall be directed toward the construction activity area and shielded from view outside of the action area to the maximum extent practicable.

4.2.21 Cumulative Effects

The alternatives listed are a single and complete effort to reduce flood risk along Cooper Creek, no future impacts are expected. The completion of this project would not increase the likelihood of additional projects, infrastructure, or development within the area.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
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In Reply Refer To: 11/20/2024 21:15:29 UTC
Project code: 2025-0022435
Project Name: Cooper Creek CAP

Subject: Consistency letter for 'Cooper Creek CAP' for specified federally threatened and endangered species and designated critical habitat that may occur in your proposed project area consistent with the Arlington Ecological Services Field Office (ESFO) Determination Key (DKey) for project review and guidance for federally listed species.

Dear Brandon Ford Ford:

The U.S. Fish and Wildlife Service (Service) received on **November 20, 2024** your effects determination for the 'Cooper Creek CAP' (the Action) using the Arlington ESFO DKey for project review and guidance for federally-listed species within the Information for Planning and Consultation (IPaC) system. The Service developed this system in accordance with the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

Based on your answers and the assistance of the Service's Arlington ESFO DKey, you determined the proposed Action will have "No Effect" on the following species:

Species	Listing Status	Determination
Piping Plover (*Charadrius melodus*)	Threatened	No effect
Rufa Red Knot (*Calidris canutus rufa*)	Threatened	No effect
Whooping Crane (*Grus americana*)	Endangered	No effect

Consultation Status

Thank you for informing the Service of your "No Effect" determinations for this project. No further consultation/coordination for this project is required for these species.

This letter only covers the listed species in the above table. The following species may also occur in the Action area:

- Alligator Snapping Turtle *Macrochelys temminckii* Proposed Threatened

- Monarch Butterfly *Danaus plexippus* Candidate
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

If you determine your project may affect additional listed or proposed listed species not covered by the Arlington ESFO DKey, please contact our office at (817) 277-1100 or your Service point of contact in the Arlington ESFO to discuss methods to avoid or minimize potential adverse effects to those species. Candidate species are not afforded protection under the ESA; however, we recommend they be considered in project planning and that conservation measures be implemented to avoid or minimize impacts to individuals or their habitat as much as possible.

The Service recommends that your agency contact the Arlington ESFO or re-evaluate the Action in IPaC if: 1) the scope, timing, duration, or location of the Action changes, 2) new information reveals the Action may affect listed species or designated critical habitat, or 3) a new species is listed or critical habitat designated. If any of the above conditions occurs, additional consultation with the Arlington ESFO should take place before project changes are final or resources committed.

At Risk Species: The Service's responsibilities under the ESA include evaluating species that have been petitioned to be listed or are candidates for listing under the ESA. These "at risk" species are not afforded protection under the ESA; however, we continue to collect information on their status and potential threats in order to assess their biological status and address requirements under the ESA. For these reasons, we request any information on the status of these species (e.g., surveys) be provided to the Arlington ESFO for consideration. This may also include any conservation measures implemented to avoid or reduce impacts to these species as a result of proposed actions. The proposed project falls within the range of the following at risk species:

Western chicken turtle (https://ecos.fws.gov/ecp/species/9903)

Bald and Golden Eagle Protection Act(BGEPA): The following resources are provided to project proponents and consulting agencies as additional information. Bald and golden eagles are not included in this section 7(a)(2) consultation and this information does not constitute a determination of effects by the Service.

The Service developed the National Bald Eagle Management Guidelines to advise landowners, land managers, and others who share public and private lands with bald eagles when and under what circumstances the protective provisions of the BGEPA may apply to their activities. The guidelines should be consulted prior to conducting new or intermittent activity near an eagle nest. This document may be downloaded from the following site: https://www.fws.gov/media/national-bald-eagle-management-guidelines-0

If the recommendations detailed in the National Bald Eagle Management Guidelines cannot be followed, you may apply for a permit to authorize removal or relocation of an eagle nest in certain instances. The application form is located at https://fwsepermits.servicenowservices.com/fws/.

Please note this guidance does not authorize bird mortality for species that are protected under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. sec. 703-712). If you believe migratory birds will be affected by this activity, we recommend you contact our Migratory Bird Permit Office at P.O. Box 709, Albuquerque, NM 87103, (505) 248-7882.

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

Cooper Creek CAP

2. Description

The following description was provided for the project 'Cooper Creek CAP':

> Flood risk reduction

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@33.247411299999996,-97.12428953724933,14z

QUALIFICATION INTERVIEW

1. Does the proposed project involve research or other actions that include the collection, capture, handling, or harassment of any individual federally listed threatened, endangered or proposed species?

   No

2. Does the proposed project involve the use of manned or unmanned aircraft (e.g., airplanes, helicopters, drones, balloons)?

   No

3. Is the action authorized, funded, or being carried out by a Federal agency?

   Yes

4. Are you the Federal agency or designated non-federal representative?

   Yes

5. Is the project a communications tower licensed or regulated by the Federal Communications Commission?

   No

6. Is the lead federal agency for the project Housing and Urban Development?

   No

7. Is this a wind energy project ?

   No

8. Is this a solar energy project ?

   No

9. [Semantic] Does the project intersect the piping plover AOI?

   Automatically answered
   Yes

10. [Semantic] Does the project intersect the red knot AOI?

    Automatically answered
    Yes

11. [Semantic] Does the project intersect the peppered chub critical habitat?

    Automatically answered
    No

12. [Semantic] Does the project intersect the whooping crane AOI?

    Automatically answered
    Yes

13. Does the action area have habitat that may be used by whooping cranes during spring and fall migrations (Mar 19- Apr 30, Oct 20 – Nov 24)?

    Note: Whooping crane habitat includes croplands and grasslands interspersed with wetlands such as lakes, ponds and rivers. The portion of water bodies used by whooping cranes tend to be shallow (up to 20 inches in depth). More information on stopover habitat can be found here: https://pubs.er.usgs.gov/publication/70202378.

    No

14. [Semantic] Does the project intersect the sharpnose shiner critical habitat?

    Automatically answered
    No

15. [Semantic] Does the project intersect the smalleye shiner critical habitat?

    Automatically answered
    No

16. [Semantic] Does the project intersect the black-capped vireo range?

    Automatically answered
    No

17. [Semantic] Does the project intersect the Texas screwstem range?

    Automatically answered
    No

18. [Semantic] Does the project intersect the western chicken turtle range?

    Automatically answered
    Yes

19. [Semantic] Does the project intersect the Kisatchie painted crayfish range?

    Automatically answered
    No

20. Do you have additional supporting documents you would like to upload to support your project review (e.g., Biological Evaluation, Habitat Assessment, Environmental Report, photos, maps, etc.)?

    No

IPAC USER CONTACT INFORMATION

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
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Email Address: arles@fws.gov

In Reply Refer To: 11/20/2024 21:31:43 UTC
Project code: 2025-0022435
Project Name: Cooper Creek CAP

Federal Nexus: yes
Federal Action Agency (if applicable): Army Corps of Engineers

Subject: Technical assistance for 'Cooper Creek CAP'

Dear Brandon Ford Ford:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on November 20, 2024, for 'Cooper Creek CAP' (here forward, Project). This project has been assigned Project Code 2025-0022435 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements are not complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project. **Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat and Tricolored Bat Range-wide Determination Key (Dkey), invalidates this letter.**

Determination for the Northern Long-Eared Bat and Tricolored Bat

Based on your IPaC submission and a standing analysis completed by the Service, you determined the proposed Project will have the following effect determinations:

Species	Listing Status	Determination
Tricolored Bat (*Perimyotis subflavus*)	Proposed Endangered	May affect

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination key for the northern long-eared bat and tricolored bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Alligator Snapping Turtle *Macrochelys temminckii* Proposed Threatened
- Monarch Butterfly *Danaus plexippus* Candidate
- Piping Plover *Charadrius melodus* Threatened
- Rufa Red Knot *Calidris canutus rufa* Threatened
- Whooping Crane *Grus americana* Endangered

You may coordinate with our Office to determine whether the Action may cause prohibited take of the species listed above.

Conclusion

Consultation with the Service is not complete. Further consultation or coordination with the Service is necessary for those species or designated critical habitats with a determination of "May Affect." A "May Affect" determination in this key indicates that the project, as entered, is not consistent with the questions in the key. Not all projects that reach a "May Affect" determination are anticipated to result in adverse impacts to listed species. These projects may result in a "No Effect", "May Affect, Not Likely to Adversely Affect", or "May Affect, Likely to Adversely Affect" determination depending on the details of the project. Please contact our Arlington Ecological Services Field Office to discuss methods to avoid or minimize potential adverse effects to those species or designated critical habitats.

Federal agencies must consult with U.S. Fish and Wildlife Service under section 7(a)(2) of the Endangered Species Act (ESA) when an action *may affect* a listed species. Tricolored bat is proposed for listing as endangered under the ESA, but not yet listed. For actions that may affect a proposed species, agencies cannot consult, but they can *confer* under the authority of section 7(a)(4) of the ESA. Such conferences can follow the procedures for a consultation and be adopted as such if and when the proposed species is listed. Should the tricolored bat be listed, agencies must review projects that are not yet complete, or projects with ongoing effects within the tricolored bat range that previously received a NE or NLAA determination from the key to confirm that the determination is still accurate. Projects that receive a may affect determination for tricolored bat through the key, should contact the appropriate Ecological Services Field Office if they want to conference on this species.

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

Cooper Creek CAP

2. Description

The following description was provided for the project 'Cooper Creek CAP':

> Flood risk reduction

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@33.247411299999996,-97.12428953724933,14z

DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect” for a least one species covered by this determination key.

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of listed bats or any other listed species?

   Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

   No

2. Is the action area wholly within Zone 2 of the year-round active area for northern long-eared bat and/or tricolored bat?

   Automatically answered
   No

3. Does the action area intersect Zone 1 of the year-round active area for northern long-eared bat and/or tricolored bat?

   Automatically answered
   No

4. Does any component of the action involve leasing, construction or operation of wind turbines? Answer 'yes' if the activities considered are conducted with the intention of gathering survey information to inform the leasing, construction, or operation of wind turbines.

   Note: For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

   No

5. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

   Yes

6. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

   No

7. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

   Note: This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

   Yes

8. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

   No

9. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

   No

10. [Semantic] Is the action area located within 0.5 miles of a known bat hibernaculum?

    Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    Automatically answered
    No

11. Does the action area contain any winter roosts or caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating bats?

    No

12. Will the action cause effects to a bridge?

    Note: Covered bridges should be considered as bridges in this question.

    No

13. Will the action result in effects to a culvert or tunnel at any time of year?

    No

14. Are trees present within 1000 feet of the action area?

    Note: If there are trees within the action area that are of a sufficient size to be potential roosts for bats answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    Yes

15. Does the action include the intentional exclusion of bats from a building or structure?

    Note: Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats or tricolored bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local Ecological Services Field Office to help assess whether northern long-eared bats or tricolored bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures.

    No

16. Does the action involve removal, modification, or maintenance of a human-made structure (barn, house, or other building) **known or suspected to contain roosting bats?**

    No

17. Will the action cause construction of one or more new roads open to the public?

    For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

    No

18. Will the action include or cause any construction or other activity that is reasonably certain to increase average daily traffic permanently or temporarily on one or more existing roads?

    Note: For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.). .

    No

19. Will the action include or cause any construction or other activity that is reasonably certain to increase the number of travel lanes on an existing thoroughfare?

    For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

    No

20. Will the proposed Action involve the creation of a new water-borne contaminant source (e.g., leachate pond, pits containing chemicals that are not NSF/ANSI 60 compliant)?

    Note: For information regarding NSF/ANSI 60 please visit https://www.nsf.org/knowledge-library/nsf-ansi-standard-60-drinking-water-treatment-chemicals-health-effects

    No

21. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

    No

22. Will the action include drilling or blasting?

    No

23. Will the action involve military training (e.g., smoke operations, obscurant operations, exploding munitions, artillery fire, range use, helicopter or fixed wing aircraft use)?

    No

24. Will the proposed action involve the use of herbicides or other pesticides other than herbicides (e.g., fungicides, insecticides, or rodenticides)?

    No

25. Will the action include or cause activities that are reasonably certain to cause chronic or intense nighttime noise (above current levels of ambient noise in the area) in suitable summer habitat for the northern long-eared bat or tricolored bat during the active season?

    Chronic noise is noise that is continuous or occurs repeatedly again and again for a long time. Sources of chronic or intense noise that could cause adverse effects to bats may include, but are not limited to: road traffic; trains; aircraft; industrial activities; gas compressor stations; loud music; crowds; oil and gas extraction; construction; and mining.

    Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    No

26. Does the action include, or is it reasonably certain to cause, the use of permanent or temporary artificial lighting within 1000 feet of suitable northern long-eared bat or tricolored bat roosting habitat?

    Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    No

27. Will the action include tree cutting or other means of knocking down or bringing down trees, tree topping, or tree trimming?

    Yes

28. Will the proposed action occur exclusively in an already established and currently maintained utility right-of-way?

    Yes

29. Will the proposed action result in the cutting of entire trees outside of the currently maintained utility right-of-way?

    Yes

30. Does the action include emergency cutting or trimming of hazard trees in order to remove an imminent threat to human safety or property? See hazard tree note at the bottom of the key for text that will be added to response letters

    Note: A "hazard tree" is a tree that is an immediate threat to lives, public health and safety, or improved property.

    No

31. Does the project intersect with the 0- 9.9% forest density category?

    Automatically answered
    Yes

32. Does the project intersect with the 10.0- 19.9% forest density category map?

    Automatically answered
    Yes

33. Does the project intersect with the 20.0- 29.9% forest density category map?

    Automatically answered
    No

34. Does the project intersect with the 30.0- 100% forest density category map?

    Automatically answered
    No

35. Will the action cause trees to be cut, knocked down, or otherwise brought down across an area greater than 0.5 acre in total extent?

    Yes

36. Does the action area intersect the tricolored bat species list area?

    Automatically answered
    Yes

37. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats?

    Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    Automatically answered
    No

38. Has a presence/probable absence bat survey targeting the tricolored bat and following the Service's Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines been conducted within the project area?

    No

39. Is suitable summer habitat for the tricolored bat present within 1000 feet of project activities?
(If unsure, answer ""Yes."")

    Note: If there are trees within the action area that may provide potential roosts for tricolored bats (e.g., clusters of leaves in live and dead deciduous trees, Spanish moss (Tillandsia usneoides), clusters of dead pine needles of large live pines) answer ""Yes."" For a complete definition of suitable summer habitat for the tricolored bat, please see Appendix A in the Service's Range-wide Indiana Bat and Northern long-eared Bat Survey Guidelines.

    Yes

40. Do you have any documents that you want to include with this submission?

    No

PROJECT QUESTIONNAIRE

Enter the extent of the action area (in acres) from which trees will be removed - round up to the nearest tenth of an acre. For this question, include the entire area where tree removal will take place, even if some live or dead trees will be left standing.

9.0

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Brandon Ford Ford
Address: 2000 Fort Point Road
City: Galveston
State: TX
Zip: 77550
Email christopher.b.ford@usace.army.mil
Phone: 4097663079

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arlington Ecological Services Field Office
17629 El Camino Real, Suite 211
Houston, TX 77058-3051
Phone: (817) 277-1100 Fax: (817) 277-1129
Email Address: arles@fws.gov

In Reply Refer To: 11/20/2024 21:12:14 UTC
Project Code: 2025-0022435
Project Name: Cooper Creek CAP

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, which may occur within the boundary of your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under section 7(a)(1) of the Act, Federal agencies are directed to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Under and 7(a)(2) and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether their actions may affect threatened and endangered species and/or designated critical habitat. A Federal action is an activity or program authorized, funded, or carried out, in whole or in part, by a Federal agency (50 CFR 402.02).

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For Federal actions other than major construction activities, the Service suggests that a biological evaluation (similar to a Biological Assessment) be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

After evaluating the potential effects of a proposed action on federally listed species, one of the following determinations should be made by the Federal agency:

1. *No effect* - the appropriate determination when a project, as proposed, is anticipated to have no effects to listed species or critical habitat. A "no effect" determination does not require section 7 consultation and no coordination or contact with the Service is necessary. However, the action agency should maintain a complete record of their evaluation, including the steps leading to the determination of affect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related information.
2. *May affect, but is not likely to adversely affect* - the appropriate determination when a proposed action’s anticipated effects to listed species or critical habitat are insignificant, discountable, or completely beneficial. Insignificant effects relate to the size of the impact and should never reach the scale where "take" of a listed species occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not be able to meaningfully measure, detect, or evaluate insignificant effects, or expect discountable effects to occur. This determination requires written concurrence from the Service. A biological evaluation or other supporting information justifying this determination should be submitted with a request for written concurrence.
3. *May affect, is likely to adversely affect* - the appropriate determination if any adverse effect to listed species or critical habitat may occur as a consequence of the proposed action, and

the effect is not discountable or insignificant. This determination requires formal section 7 consultation.

The Service has performed up-front analysis for certain project types and species in your project area. These analyses have been compiled into *determination keys*, which allows an action agency, or its designated non-federal representative, to initiate a streamlined process for determining a proposed project's potential effects on federally listed species. The determination keys can be accessed through IPaC.

The Service recommends that candidate species, proposed species, and proposed critical habitat be addressed should consultation be necessary. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found at: https://www.fws.gov/service/section-7-consultations

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (https://www.fws.gov/library/collections/bald-and-golden-eagle-management). Additionally, wind energy projects should follow the wind energy guidelines (https://www.fws.gov/media/land-based-wind-energy-guidelines) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: https://www.fws.gov/media/recommended-best-practices-communication-tower-design-siting-construction-operation. The Federal Aviation Administration (FAA) released specifications for and made mandatory flashing L-810 lights on new towers 150-350 feet AGL, and the elimination of L-810 steady-burning side lights on towers above 350 feet AGL. While the FAA made these changes to reduce the number of migratory bird collisions (by as much as 70%), extinguishing steady-burning side lights also reduces maintenance costs to tower owners. For additional information concerning migratory birds and eagle conservation plans, please contact the Service's Migratory Bird Office at 505-248-7882.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in

the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

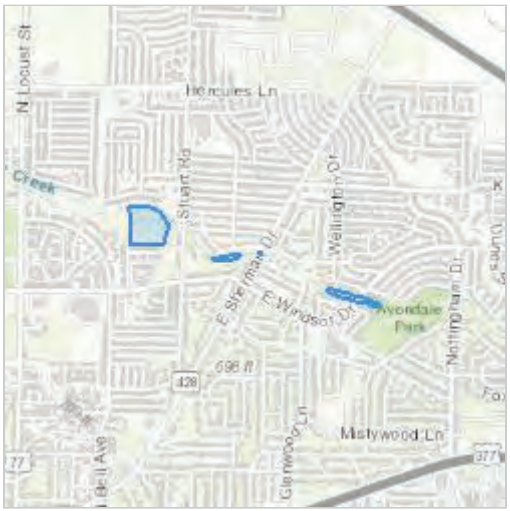
This species list is provided by:

Arlington Ecological Services Field Office
17629 El Camino Real, Suite 211
Houston, TX 77058-3051
(817) 277-1100

PROJECT SUMMARY

Project Code: 2025-0022435
Project Name: Cooper Creek CAP
Project Type: Flooding
Project Description: Flood risk reduction
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@33.247411299999996,-97.12428953724933,14z



Counties: Denton County, Texas

ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. This species only needs to be considered under the following conditions: ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Rufa Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. This species only needs to be considered under the following conditions: ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane *Grus americana* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/758	Endangered

REPTILES

NAME	STATUS
Alligator Snapping Turtle *Macrochelys temminckii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4658	Proposed Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

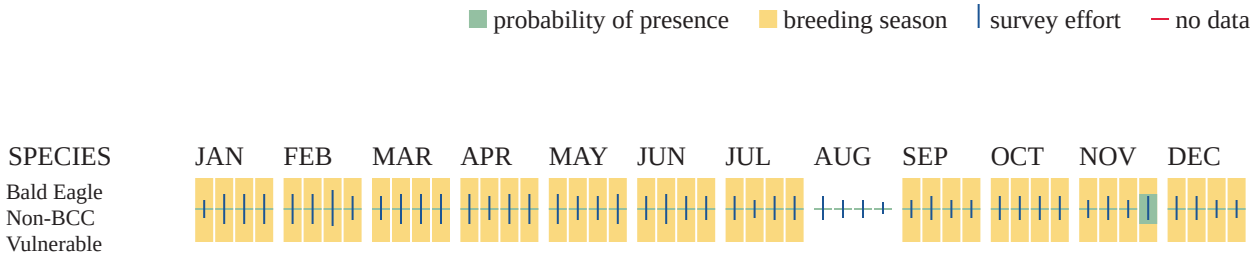
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Golden-plover *Pluvialis dominica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10561	Breeds elsewhere
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Least Tern *Sternula antillarum antillarum* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/11919	Breeds Apr 25 to Sep 5
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere

NAME	BREEDING SEASON
Little Blue Heron *Egretta caerulea* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9477	Breeds Mar 10 to Oct 15
Pectoral Sandpiper *Calidris melanotos* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9561	Breeds elsewhere
Prairie Loggerhead Shrike *Lanius ludovicianus excubitorides* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8833	Breeds Feb 1 to Jul 31
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9439	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10
Sprague's Pipit *Anthus spragueii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8964	Breeds elsewhere

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

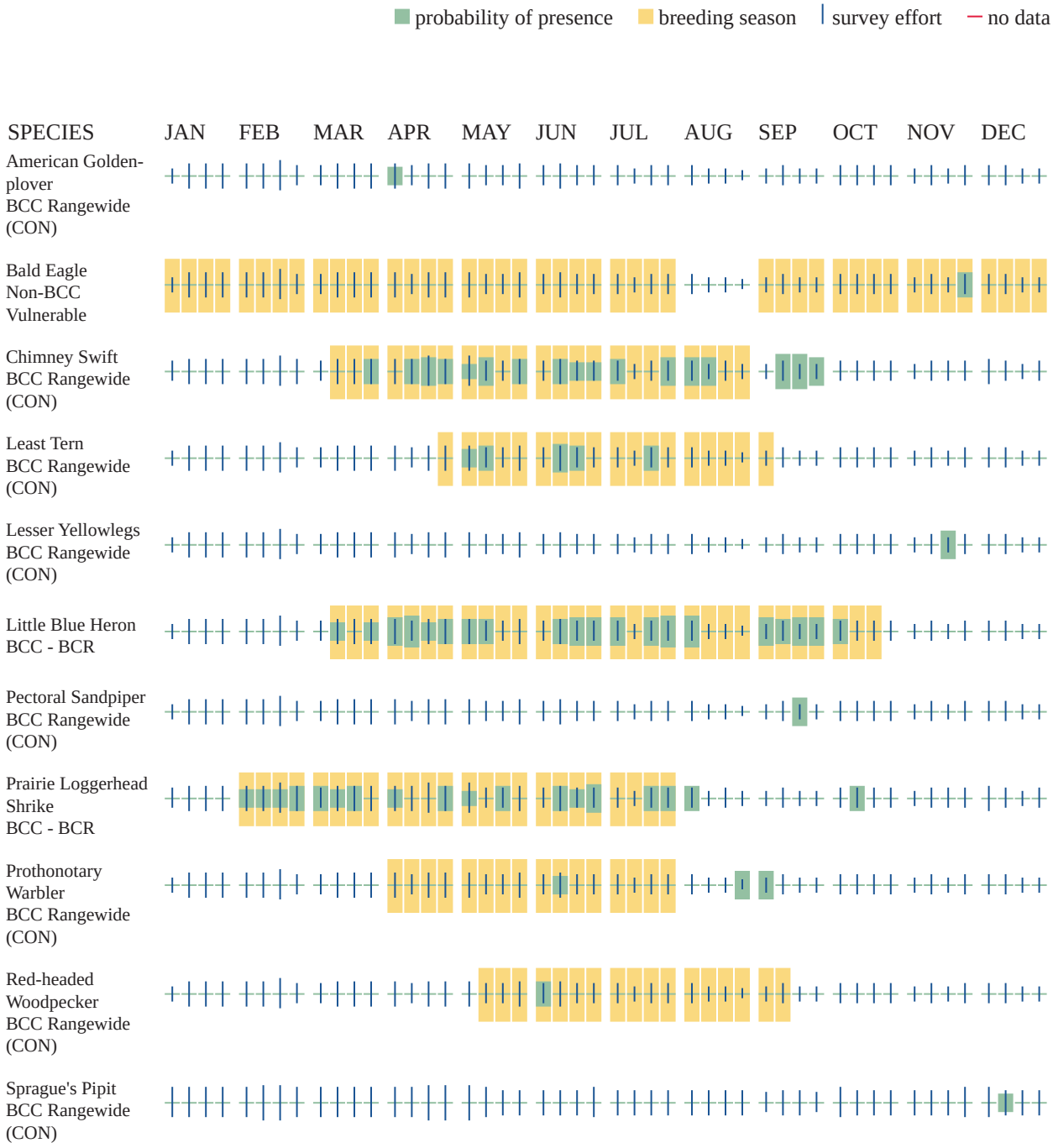
Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

RIVERINE

- R4SBCx

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1A

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Appendix C: Economics

Cooper Creek, Denton, TX

Section 205

Closeout Report

February 2025

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1.0 Introduction

This appendix presents economic analysis for the Cooper Creek Study. The economics component of the study included identifying structures in the floodplain along with relevant characteristics such as building type, structure replacement value, structure content value, and estimating flood damages under different frequency of flood events. Expected annual damages were used to determine if project alternatives were economically justified using standard National Economic Development (NED) metrics. NED analysis is a fundamental component of planning studies, and the purpose is to determine whether a proposed project is a sound investment for federal taxpayers. The study area is in Denton County, Texas in areas along Cooper Creek. Denton is part of the Dallas Fort Worth Metropolitan Statistical Area, and has population of about one million people.

2.0 Structure Inventory

The team's hydrologists and engineers developed a reasonable impact area based on a review of past studies and other data (Figure 1). With the impact area boundaries, PDT economists compiled a structure inventory based on surface water profiles and depth grids developed by the hydrologist using HEC-RAS (both 1-dimensional and 2-dimensional geometries) for existing conditions. Given that the impact area is "built out", meaning future expansion of developable land is not likely, the future without project conditions are assumed to mirror the existing conditions for economic analyses. The marked structures in Figure 1 comprise the structure inventory and were selected using the 0.002 Annual Chance Exceedance (500-year event) inundation area with a 500-foot buffer within the impact area.

Based on data from the USACE National Structure Inventory 2022 (NSI22), the area prone to flooding is primarily residential with 684 structures total. There are 654 residential structures that are mostly (96 percent) one-story single-family detached homes and, of these, about 90 percent rest on concrete slab foundations with first-floor elevations range approximately 0.5-to-2.0 feet above grade. Most (98 percent) of structures have wooden exterior walls and none have basements.

Flood impact analysis discussed in subsequent sections mostly affects residential structures. Based on data from the NSI22, structure market values (net of land value) range from about $42,000 to $860,000 with an average and median of $188,000 and $190,000 respectively and a standard deviation of $60,000 (Table 1). A review of 2024 Denton County appraisal records show that these values are more or less accurate.[1]

Per USACE policy and guidance, structure monetary values used in the analysis must be based on depreciated replacement value (DRV) as opposed to market value, which can fluctuate considerably based on several factors such as broader national and local economic trends. To estimate DRV for the structure inventory, the PDT relied on construction cost data published by

[1] A search map with appraisal values is available at: https://www.dentoncad.com/maps

RS Means maintained by USACE cost engineers. Specifically, economists applied construction per square foot to arrive at a baseline replacement value and then applied depreciation factors also published by RS Means to estimate DRV. Since NSI22 values are in year 2022, RS Means construction cost indices for the Dallas Fort Worth MSA were applied to estimate DRVs at 2024 price levels. Table 2 summarizes DRV estimates used to calculate NED benefits.

Figure 1
Study Impact Area and Structures (Denton County, Texas)

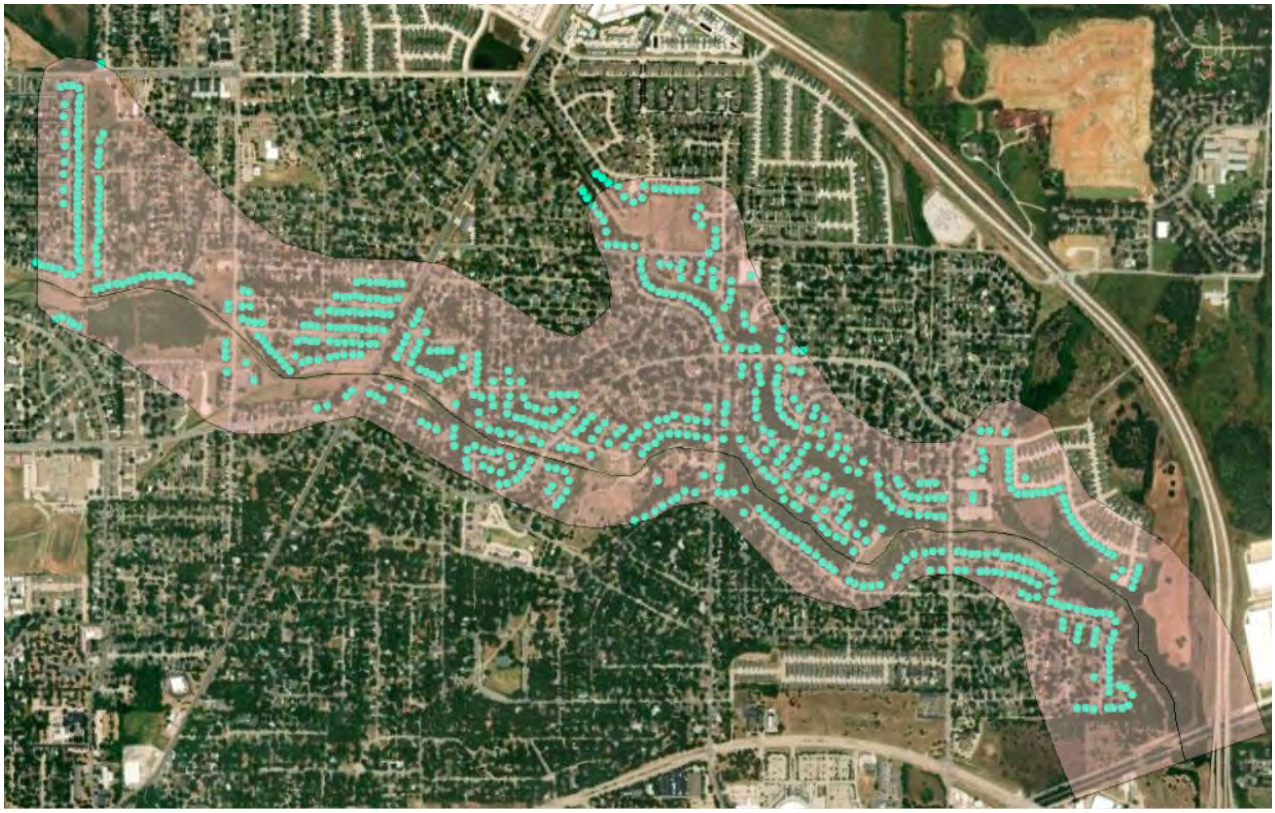


Table 1
Structure Values Reported in the USACE National Structure Inventory (2022) for the Cooper Creek Impact Area

Damage Category	Count	NSI Structure Value	Mean	Standard Deviation	Minimum	Maximum
Residential	655	$122,916,000	$187,658	$69,665	$42,498	$859,241
Commercial	18	$4,457,000	$247,611	$184,014	$112,833	$990,609
Public	10	$1,896,000	$189,600	$23,930	$156,821	$225,840
Industrial	1	$226,000	$226,000	$0	$226,000	$226,000

Damage Category	Count	NSI Structure Value	Mean	Standard Deviation	Minimum	Maximum
Total	684	$129,495,000.0	$189,320	$75,047	$42,498	$990,609

Table 2
Estimated Depreciated Replacement Value for Structures in the Cooper Creek Impact Area

Damage Category	Count	Depreciated Replacement Value	Mean	Standard Deviation	Minimum	Maximum
Residential	655	$86,364,000	$131,853	$63,087	$42,498	$786,948
Commercial	18	$3,215,000	$178,611	$63,178	$89,437	$866,001
Public	10	$1,282,000	$128,200	$56,622	$98,222	$186,420
Industrial	1	$138,000	$138,000	$0	$138,000	$138,000
Total	684	$90,999,000	$133,039	$75,047	$38,614	$866,001

3.0 Economic Evaluation Methodology

The Flood Damage Reduction Analysis (HEC-FDA) software developed by the USACE Hydrologic Engineering Center provides the capability to perform an integrated hydrologic engineering and economic analysis during the formulation and evaluation of flood risk management plans. HEC-FDA is designed to assist USACE study members in using risk assessment procedures for formulating and evaluating flood risk management measures pursuant to pertinent policy and guidance (EM 1110-2-1619, ER 1105-2-101). HEC-FDA is USACE's only tool certified to support inland flood risk assessment recommendations and has supported 49 chief's reports in the last 10 years in which HEC-FDA was used by USACE project delivery teams to identify more than $5 billion in annual benefits that justified nearly $44 billion in flood risk management investment recommendations.

USACE makes investment decisions for flood risk management projects using marginal expected annual damages. Flood events have return intervals that are based on the probability that such an event will occur in any *single* year over the recurrence interval. Total damages (single event damages) ignore the probability (annual exceedance probability) and assume that the flood happens and damages manifest. In contrast, expected annual damages are weighted by the probability. For example, for a 10-year flood event (0.10 probability), total or single event damages are weighted by 0.10. Intervals or marginal changes between events ensure there is no double counting. Standard event frequencies included in an FDA model are the 2,5,10,25,50,100,250 and 500-year recurrence intervals.

Key inputs in FDA consist of hydrologic, design engineering, economic and project construction, or implementation cost data. Hydrologists develop hydraulic inputs, flow frequency functions and stage discharge functions for both existing and the future without project conditions along with inundation data including geospatial mapping products. Economists focus on developing

structure inventories and parameters for NED analysis such as discount rates and converting cost and benefits to annualized values. Lastly, design engineers conceptualize structural study alternatives, and cost engineers provide construction or implementation cost estimates.

Once relevant inputs are collected and entered, FDA estimates changes in hydraulics resulting from structural alternatives, and how changes affect flood impacts to structures in the study area. Reduced damages are NED benefits, and these are compared to the financial costs of different alternative formulations. Structural alternatives directly affect hydraulics in the study, while non-structural alternatives do not, but can reduce damages such as changes to structures. For example, purchasing properties to remove them from a floodplain, or elevating structures are considered non-structural alternatives even thought they involve construction.

For the economic analysis, key assumptions for the economic evaluation: 1) costs and benefits are annualized to a common reference point using a 50-year period of analysis and a discount rate of 3.00 percent (approved value for fiscal year 2025), and 2) the future without project condition is the same as existing conditions given that the study is fully developed and zoned accordingly; thus, future expansion in the area is not possible. For FDA, depth damage functions and content value ratios are from Engineering Guidance Memorandum 01-03.

4.0 Summary of Baseline Estimated Damages

To illustrate the extent of flooding, Figures 2 and 3 show flooding for the without project condition for the 0.10 AEP (10-year) event and the 0.002 AEP event (500-year), and Table 3 displays single event damages (unweighted by probability) for the suite of flood events included in an FDA analysis. At higher frequency events, depths relative to first floor structure elevations and estimated damages are limited, while at lower frequencies, they are higher and at the extreme (0.002 AEP) structure and content damages total $7.8 million. Total Expected Annual Damage (EAD) across the range of modeled flood events is roughly $907,000.

Table 3
Single Event Flood Depths and Damages for Structures with Modeled Damages
(monetary values in $millions)

Annual Exceedance Probability	0.5 AEP	0.2 AEP	0.1 AEP	0.04 AEP	0.02 AEP	0.01 AEP	0.005 AEP	0.002 AEP
Depth Relative to First Floor Elevations								
Mean	(0.80)	(0.40)	(0.20)	0.06	0.24	0.41	0.52	0.64
Standard Deviation	0.00	0.64	0.68	0.69	0.72	0.73	0.79	0.86
Maximum	0.16	1.06	1.48	1.98	2.54	3.07	3.57	4.23
Minimum	(1.82)	(1.93)	(1.92)	(1.82)	(1.89)	(1.51)	(1.46)	(1.95)
Single Event Damages ($millions)								
Structures	$0.20	$0.85	$1.50	$2.31	$2.86	$3.46	$4.01	$4.90
Content and vehicles	$0.15	$0.56	$0.95	$1.43	$1.73	$2.06	$2.36	$2.88
Total	$0.34	$1.42	$2.45	$3.75	$4.59	$5.53	$6.37	$7.78

Figure 2
Flood Inundation at the 0.10 Annual Exceedance Probability Event
(10-year frequency interval)

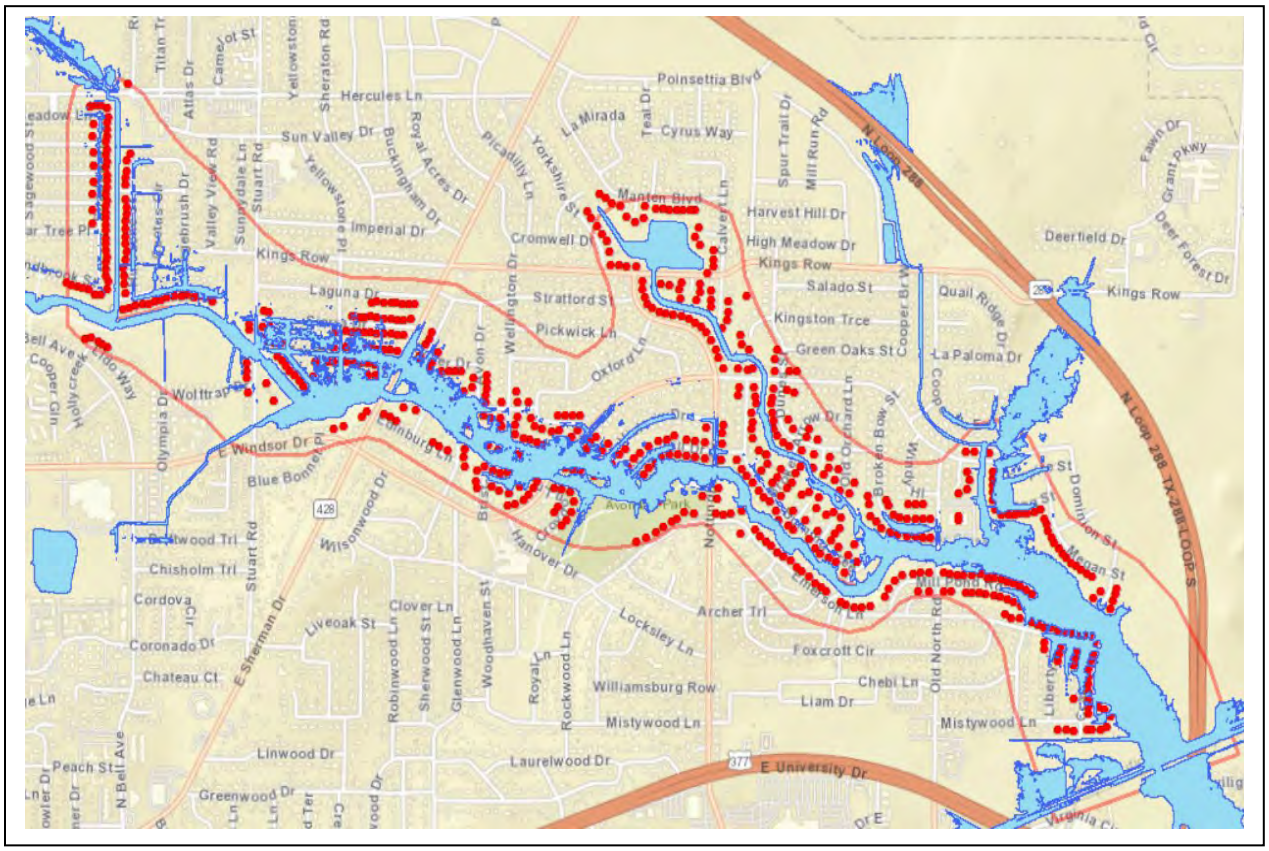
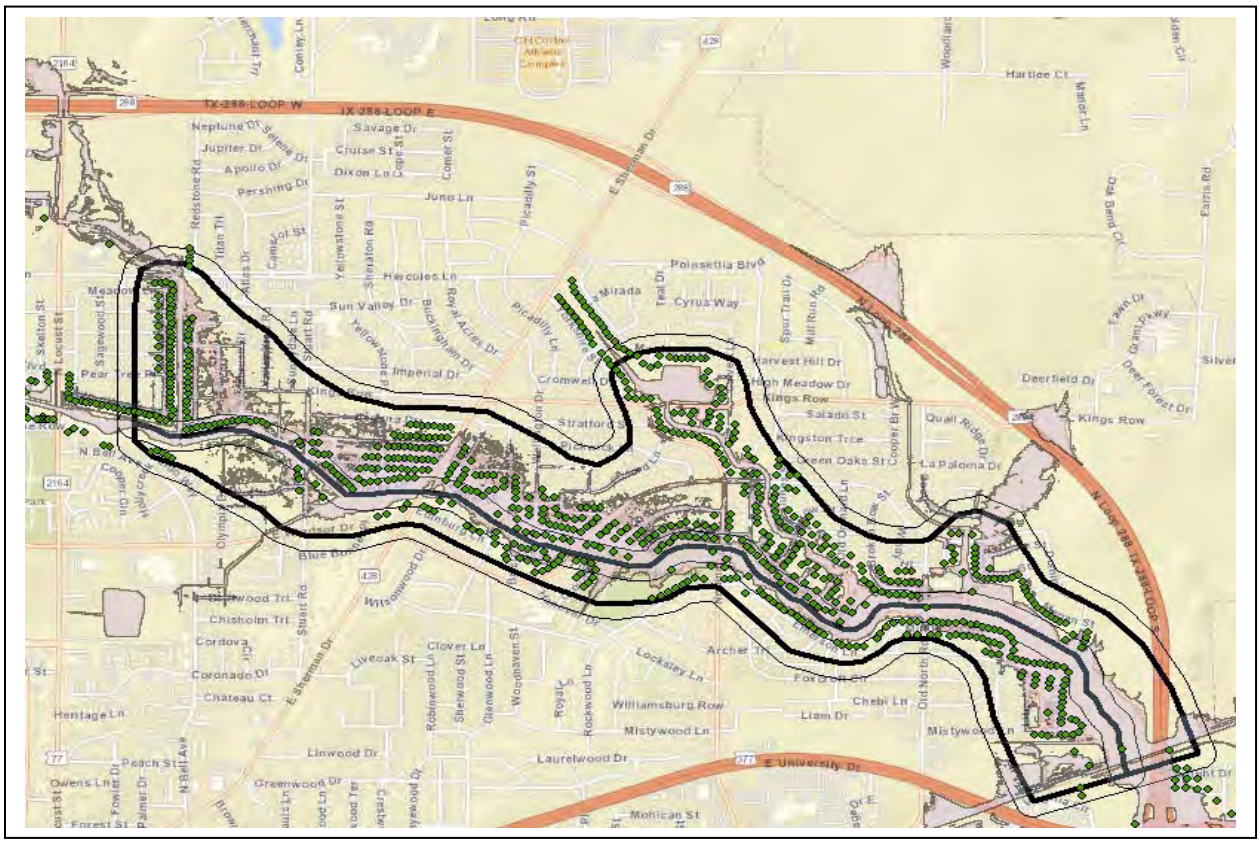


Figure 3
Flood Inundation at the 0.002 Annual Exceedance Probability Event
(500-year frequency interval)



5.0 National Economic Development Analysis

National Economic Development (NED) analysis is a key part of evaluating projects to address water resources problems with USACE involvement. Generally, this involves estimating economic benefits of a project from a federal or national perspective, and comparing benefits to the financial costs of project construction or implementation. From an economic perspective, projects with the greatest net benefits (annualized benefits less costs) are considered the NED plan, and such projects require a benefit to cost ratio (BCR) of greater than 1.0 to be considered a sound investment on the part of the federal government.

Structural alternative include:

- Alt 2A1
- Alt 2C1
- Alt 2D1
- Alt 3A1
- Alt 5A1

- Alt 8A1
- Alt 17A1

The main report and engineering appendix describes these in detail. Nonstructural alternatives (NSA) consist of buyouts and structural elevation for properties showing damages for the 50, 25 and 10-year recurrence intervals. Buyouts would involve a complete purchase of properties at market value and demolition costs of removing structures. Structure elevation consists of raising homes off their foundations and placing support columns underneath to protect from flooding. For both buyouts and elevation, it is assumed that all damages estimated for existing and future without project conditions would be eliminated. Affected structures are those identified in each inundation footprint for each recurrence interval. Thus, benefits are the entirety of avoided existing without project impacts.

Selection of the properties in the 10, 25 and 50-year flood plains intervals is based on the notion that the alternatives would focus on structures prone to repetitive damages (i.e., damages that occur at higher frequency intervals). For structural elevation alternatives, cost estimates assume that structures would be raised to eliminate damages across all flood frequencies for structures in each alternative footprint with the underlying logic that the bulk of elevation costs involve removing homes from their foundations, and the marginal costs of additional height are small relative to total costs.

- Elevation (50 YR)
- Elevation (25YR)
- Elevation (10 YR)
- Buyout (50 YR)
- Buyout (25 YR)
- Buyout (10 YR)

Table 4 displays NED metrics including project costs, reduced flood damages (EAD) of each alternative, net benefits and BCRs. EAD values and BCRs show stochastic ranges estimated by FDA based on uncertainty in hydrologic and economic variables, all of which have an underlying probability distribution. The mid-point or mean value is typically the benchmark used as a decision metric in terms of NED analysis. Results indicate that no alternative plans meet NED thresholds.

Table 4
Single Event Flood Depths and Damages for Structures with Modeled Damages

Alternative	Implementation Costs		Expected Annual Damages Reduced (Benefits)				Net Benefits (Mean)	Benefit to Cost Ratios			
	First Costs	Annual Costs	Mean	1st Quartile	2nd Quartile	3rd Quartile		Mean	1st Quartile	2nd Quartile	3rd Quartile
Alt 2A1	$3,043,000	$134,474	$12,874	$6,670	$11,815	$20,385	($121,600)	0.10	0.05	0.09	0.15
Alt 2C1	$8,662,000	$390,113	$301,202	$49,486	$117,290	$340,197	($88,911)	0.77	0.13	0.30	0.87
Alt 2D1	$10,112,000	$455,417	$335,779	$49,898	$128,643	$370,760	($119,638)	0.74	0.11	0.28	0.81
Alt 3A1	$9,194,000	$416,833	$335,778	$61,178	$139,903	$380,235	($81,055)	0.81	0.15	0.34	0.91
Alt 5A1	$15,226,431	$1,587,349	$236,631	$44,910	$106,262	$270,594	($1,350,718)	0.15	0.03	0.07	0.17
Alt 8A1	$4,225,000	$186,708	$85,595	$21,443	$59,219	$114,615	($101,113)	0.46	0.11	0.32	0.61
Alt 17A1	$10,608,000	$486,580	$337,429	$60,807	$141,618	$383,932	($149,151)	0.69	0.12	0.29	0.79
Elevation (50 YR)	$34,606,000	$1,540,667	$752,000	$307,790	$523,334	$943,735	($788,667)	0.49	0.20	0.34	0.61
Elevation (25YR)	$26,460,000	$1,176,031	$679,055	$242,017	$503,097	$859,646	($496,976)	0.58	0.21	0.43	0.73
Elevation (10 YR)	$16,914,000	$751,753	$542,000	$286,271	$454,538	$697,080	($209,753)	0.72	0.38	0.60	0.93
Buyout (50 YR)	$55,781,254	$2,200,325	$752,000	$307,790	$523,334	$943,735	($1,448,325)	0.34	0.14	0.24	0.43
Buyout (25 YR)	$39,307,987	$1,550,527	$679,055	$242,017	$503,097	$859,646	($871,472)	0.44	0.16	0.32	0.55
Buyout (10 YR)	$22,880,759	$902,545	$542,000	$286,271	$454,538	$697,080	($360,545)	0.60	0.32	0.50	0.77

Appendix D: Hydraulics and Hydrology

Cooper Creek, Denton, TX

Section 205

Closeout Report

February 2025

1.0 INTRODUCTION

Hydrologic and hydraulic analyses were conducted as part of the feasibility study to evaluate alternatives developed by the PDT to address flood related damages along Cooper Creek. A without-project condition model for the Cooper Creek was created to simulate the hydrologic and hydraulic response of the watershed. The without-project condition model was then modified with different measures including floodwater detention, channel improvement and bridge/culvert improvements to improve the management of flood risk within the Cooper Creek watershed.

1.1 Study Area

The study area is the Cooper Creek watershed located within the City of Denton, Texas. Denton is the county seat of Denton County and is in north central Texas approximately 36 miles north of Fort Worth and 38 miles northwest of Dallas. Direct freeway access between Denton and Fort Worth/Dallas is provided via IH-35W and IH-35E. According to US Census Bureau, Denton had a 2023 population of 158,349 and covers 87.95 square miles. The City of Denton lies within the Trinity River basin.

Cooper Creek is located in the northern part of the City of Denton, Texas. The creek flows in a southeasterly direction though the city and terminates at Lewisville Lake. The watershed of Cooper Creek is about 6.1 miles long and conveys a drainage area of approximately 9.35 square miles. Cooper Creek is generally a trapezoidal, unlined earthen channel. The creek is generally small but well defined, mostly unimproved channel with several tributaries. The main channel has an average depth of 6 feet, top width of 50 feet and a slope of 25 feet per mile. The creek is normally dry with flow occurring during periods of heavy rainfall.

There are several culvert crossings that have limited capacity and cause backwater conditions within the stream channel. The 100-year floodplain generally extends beyond the stream banks and into the residential yards. Existing detention ponds were constructed within Cooper Creek's watershed to reduce flood damages along the creek. There is some channel erosion along Cooper Creek due to high velocities in the channel.

At present, most of the development within Cooper Creek watershed is residential (mostly single-family), with a few schools and parks scattered within the watershed. While the watershed is nearly fully developed, there are some areas in the upstream reaches of Cooper Creek and its tributaries that are presently undeveloped and future development of these areas may worsen the backwater problems, causing additional flooding along Cooper Creek. Commercial development is widely scattered throughout the lower end of the watershed and has only minimal flood damage potential. Much of the vegetative cover is in its natural state except where residential development has encroached upon the creek in the upper end of the watershed. A map of the Cooper Creek watershed is included in Figure 1.

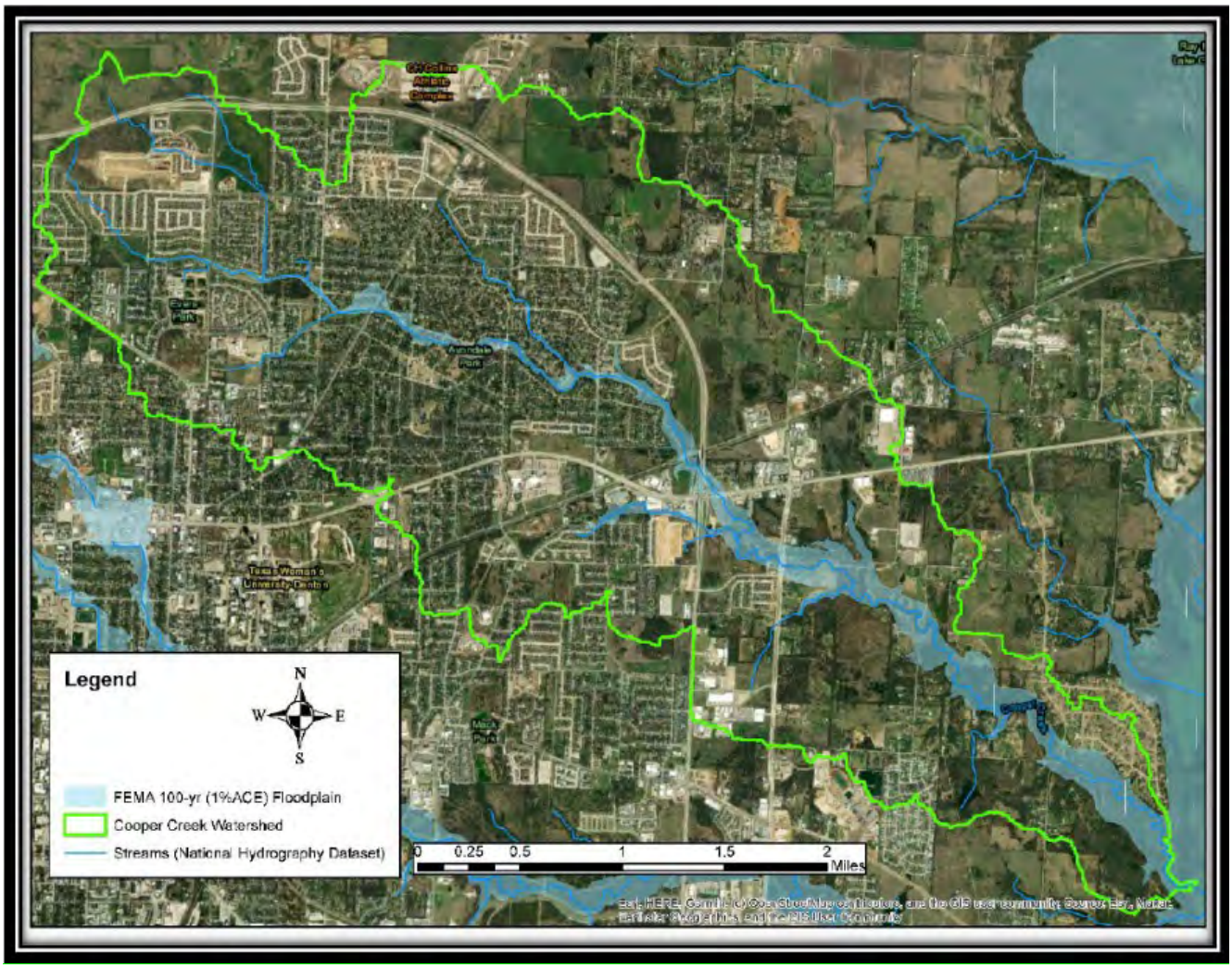


Figure 1 Cooper Creek Watershed

Based on previous USACE studies and input from the Non-Federal Sponsor (NFS), the primary areas of flooding concern were along Cooper Creek above Mingo Rd (Figure 2). During development of existing conditions modeling, a significant number of structures, between 0.25 – 1.0 mile upstream of the NFS identified area (Between Stuart Rd. and Windsor Dr.), were experiencing economic damages in the 10-year to 25-year floodplains as well (Figure 3).

Figure 2 NFS Proposed Study Areas

Figure 3 Structures located within 25-year Floodplain between Sherman Drive and Stream CC-2

1.2 Prior Studies

Flood hazard information has been identified for the Cooper Creek watershed back to 1977. In 1977, hydrologic and hydraulic analysis work was completed by the U.S. Geological Survey (USGS) for the Federal Emergency Management Agency (FEMA). In December 1979, the U.S. Army Corps of Engineers (USACE) prepared a reconnaissance report on the flooding problems in the City of Denton (FEMA, 2001). In 1982, the USACE completed a Continuing Authorities Program (CAP) Section 205 study that identified several plans with benefit-to-cost ratios above 1.0. The selected plan included a total of about 4,000 feet of channel improvement passing between a 10-year to 25-year flood event. A map of the selected plan is included in Figure 4 (USACE, 1982).

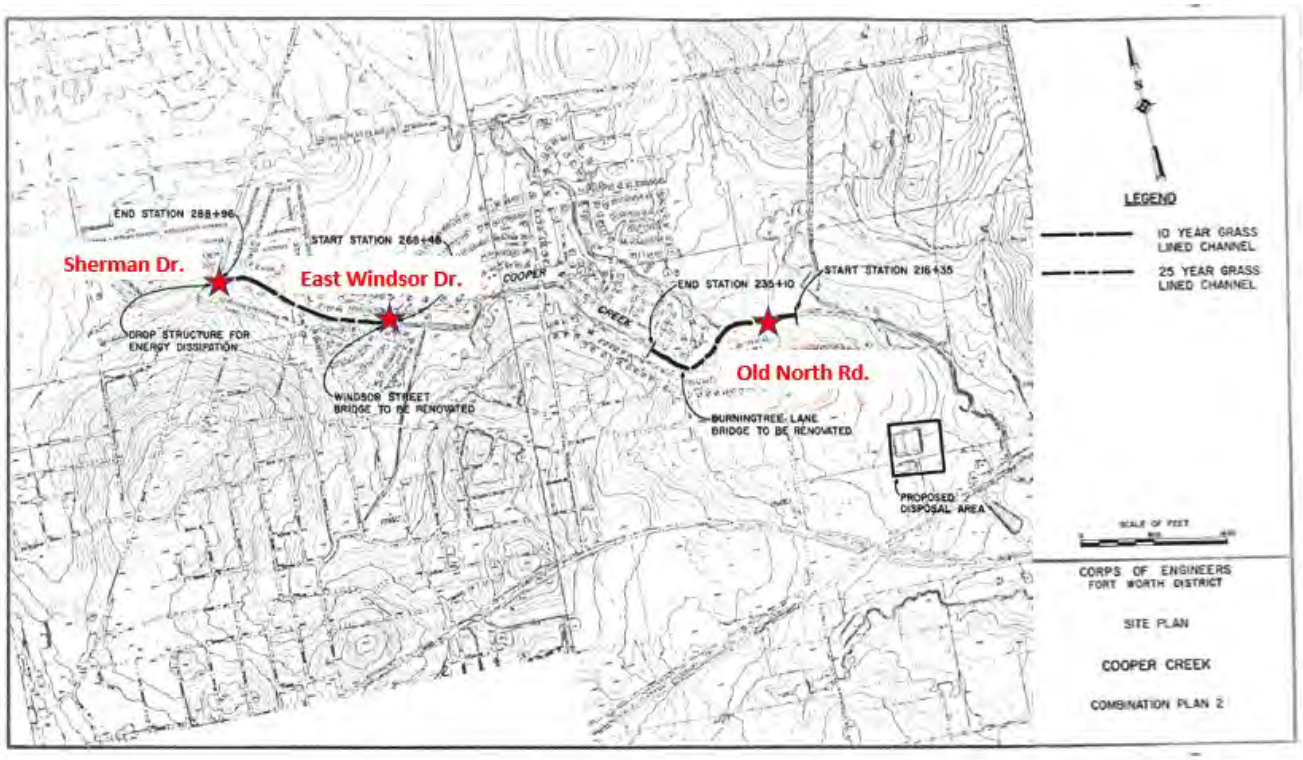


Figure 4 Plan view of Selected Plan from 1982 USACE Cooper Creek CAP Section 205 Study

In March 1985, The FEMA Flood Insurance Study (FIS) information was updated by the USACE Fort Worth District (FEMA, 2001). In 2009, a flood mitigation study was performed for the City of Denton by Jacobs Engineering Group. The 2009 study identified potential detention and bridge modification alternatives but did not include any economic benefit information (Jacobs, 2009). In 2023, a stormwater master plan needs assessment was performed for the City of Denton by Freese and Nichols, Inc. The 2023 study was a high-level study that identified potential areas along Cooper Creek for further analysis. While potential areas were identified, actual alternative analysis was not performed as part of this study (Freese, 2023).

2.0 HYDROLOGIC ANALYSIS

A detailed hydrologic analysis of the Cooper Creek watershed was performed to develop discharge-frequency relationships for the Cooper Creek watershed for existing without-project conditions. Computed peak discharges were developed for the 50, 20, 10, 4, 2, 1, 0.5 and 0.2% annual chance storms or storms that have recurrence intervals of 2, 5, 10, 25, 50, 100, 200 and 500 years, respectively. The 100-yr flood is defined as the flood which has a 1% chance of occurring in any given year. The hydrologic analysis was performed using Hydrologic Engineering Center Hydrologic Modeling System (HEC-HMS) version 4.12 and Hydrologic Engineering Center River Analysis System (HEC-RAS) version 6.5. HEC-HMS was used to compute flow hydrographs for individual subbasins while HEC-RAS was used to combine and route the subbasin hydrographs.

2.1 Streamflow Gauging

There are no U.S. Geological Survey (USGS) streamflow recording gauges within the Cooper Creek watershed. Nearby gages (Hickory Creek at Denton, Texas; Clear Creek near Sanger, Texas; and Ray Roberts Lake near Pilot Point, Texas) have drainage areas (129+ square miles) and land use types (primarily rural) significantly different than the Cooper Creek watershed and were not used in this analysis.

2.2 Drainage Basin Delineation

The Cooper Creek watershed includes approximately 9.35 square miles was sub-divided into 28 sub-basins. The watershed was subdivided using 1m StratMap LiDAR (North & Central Texas) terrain data flown in 2020. The Lidar was downloaded from the Texas Geographic Information Office (formerly TNRIS)

in June 2024. Watershed characteristics such as drainage area, watercourse length, location of centroid, basin slope, land use, and soil type were developed for each sub-basin (Figure 5).

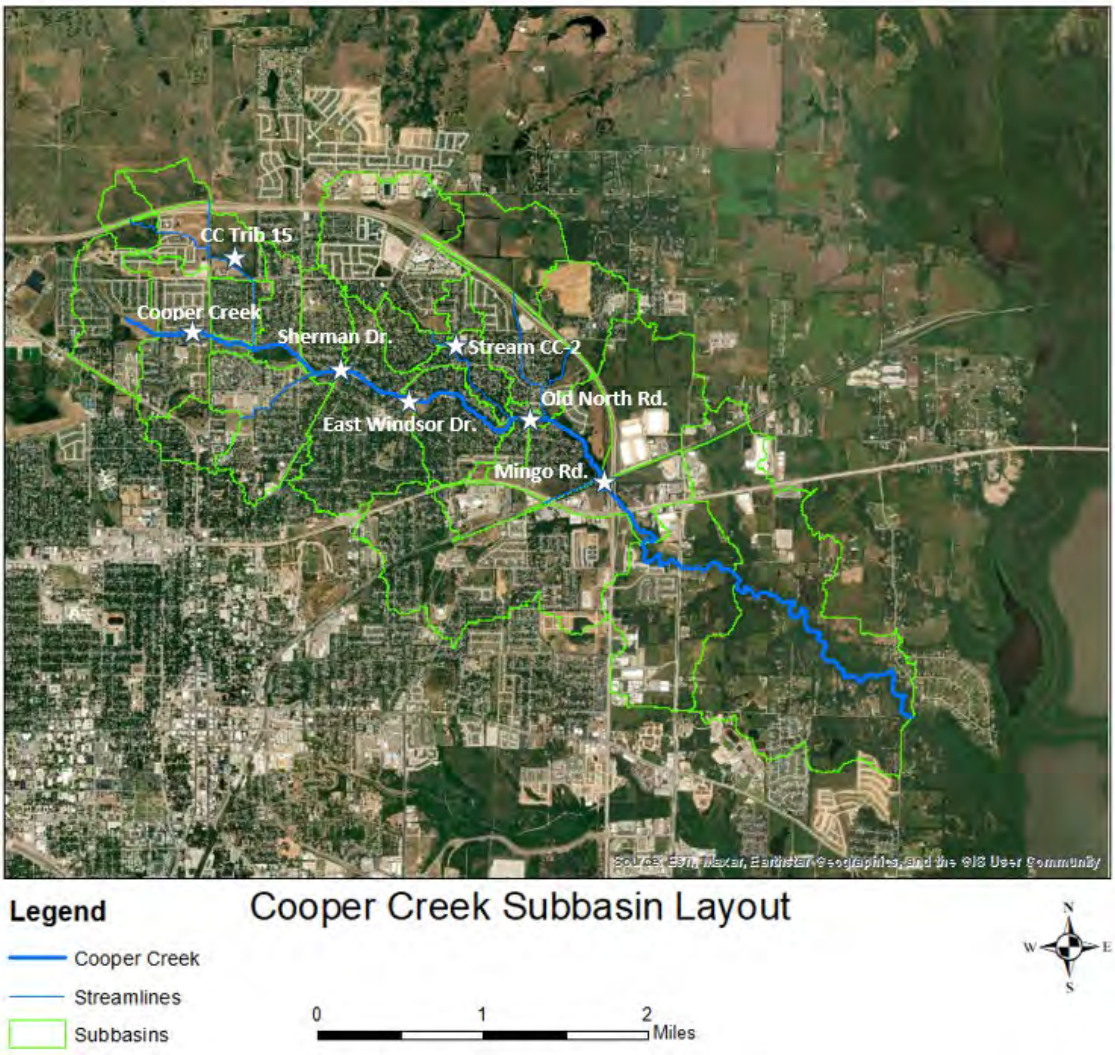


Figure 5 Cooper Creek Subbasin Layout

Based on previous USACE studies and input from the NFS, the primary areas of flooding concern were along Cooper Creek above Mingo Rd. During development of existing conditions modeling, a significant number of structures, between 0.25 – 1.0 mile upstream of the NFS identified area (Between Stuart Rd. and Windsor Dr.), were experiencing economic damages in the 10-year to 25-year floodplains as well.

2.3 Precipitation Data

Precipitation for each frequency storm was developed using data from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 report. NOAA Atlas 14 Volume 11 covers the state of Texas and was published in 2018. The values (Table 1) were extracted from Cooper Creek at Sherman Drive but the values do not vary across the small study area. Rainfall volumes were not reduced due to study area's

small drainage area. HEC-HMS utilized the precipitation frequency estimates and generated balanced hyetograph storms with the most intense portion of the event falling halfway through the storm.

Table 1 Precipitation Frequency Estimates

Return Period (years)	2yr	5yr	10yr	25yr	50yr	100yr	200yr	500yr
5-min	0.45	0.58	0.68	0.81	0.90	0.99	1.08	1.20
10-min	0.73	0.94	1.09	1.30	1.45	1.59	1.74	1.92
15-min	0.90	1.16	1.36	1.60	1.79	1.97	2.15	2.38
30-min	1.26	1.61	1.88	2.22	2.46	2.71	2.96	3.29
60-min	1.63	2.10	2.45	2.91	3.24	3.57	3.92	4.38
2-hr	2.00	2.62	3.08	3.69	4.16	4.63	5.13	5.82
3-hr	2.23	2.93	3.47	4.20	4.75	5.32	5.94	6.79
6-hr	2.64	3.51	4.18	5.10	5.80	6.55	7.36	8.48
12-hr	3.11	4.15	4.96	6.05	6.89	7.79	8.76	10.10
24-hr	3.64	4.86	5.80	7.08	8.06	9.10	10.20	11.90

2.3 Model Development

Using the USACE Hydrologic Engineering Center – Hydrologic Modeling System (HEC-HMS) version 4.12 software, a watershed runoff model was developed for without-project conditions. A 1-minute computation interval was used in the model to provide detail (shaping) of the unit hydrograph applied at the smaller subbasins in the analysis.

2.4 Land Use Data

Future land use data was acquired from the City of Denton that represented the City's best estimate on how the watershed will develop over the next 50 years or more. The existing land use was created using the future land use data and comparing with aerial imagery. Where the future land use did not match the existing condition imagery, the future land use data was modified to create an existing conditions dataset. Land use and percent urban and percent impervious relationships were developed by the USACE Fort Worth District and have been in use on since the 1980s. These relationships are documented in the North Central Texas Council of Governments (NCTCOG) integrated Stormwater Management (iSWM) Technical Manual (Figure 6).

Land Use	Description	Percent Imperviousness	Percent Urbanization
Low Density Residential	Single family: ½ – 2 units per acre; average 1 unit per acre.	25	30
Medium Density Residential	Single family: 2 – 3½ units per acre; average 3 units per acre.	41	80
High Density Residential	Single family: greater than 3½ units per acre; average 4 units per acre.	47	90
Multifamily Residential	Row houses, apartments, townhouses, etc.	70	95
Mobile Home Parks	Single family: 5–8 units per acre.	20	40
Central Business District	Intensive, high-density commercial	95	95
Strip Commercial	Low-density commercial; average 3 units per acre.	90	90
Shopping Centers	Grocery stores, drug stores, malls, etc.	95	95
Institutional	Schools, churches, hospitals, etc.	40	50
Industrial	Industrial centers and parks; light and heavy industry.	90	95
Transportation	Major highways, railroads.	35	80
Communication	Microwave towers, etc.	35	50
Public Utilities	Transformer stations, transmission line right-of-way, sewage treatment facilities, water towers, and water treatment facilities.	60	70
Strip Settlement	Densities less than ½ – 2 units per acre; average 1 unit per 3 – 5 acres.	10	20
Parks and Developed Open Space	Parks, cemeteries, etc.	6	10
Developing	Land currently being developed.	15	20
Cropland	Pasture, short grasses.	3	5
Grassland		0	0
Woodlands, Forest		0	0
Water Bodies	Lakes, large ponds.	100	100
Barren Land	Bare exposed rock, strip mines, gravel pits.	0	0

Sources: Determination of Percent Urbanization/Imperviousness in Watersheds, May 1, 1986, U.S. Army Corps of Engineers
SCS, TR-55, Second Edition, June 1986

Figure 6 Percent Urbanization and Imperviousness Summary with Associated Land Use Categories

Land use values were correlated with percent urban and percent impervious values and the final Cooper Creek percent urban and impervious values are identified in Table 2 and Table 3. The percent urban values used to develop transform parameters within the HEC-HMS model and the percent impervious values were applied to the loss method within the HEC-HMS model. A spatial representation of the changes from the existing to future percent urban values is included in Figure 7. The percent impervious maps show similar change from Existing to Future conditions.

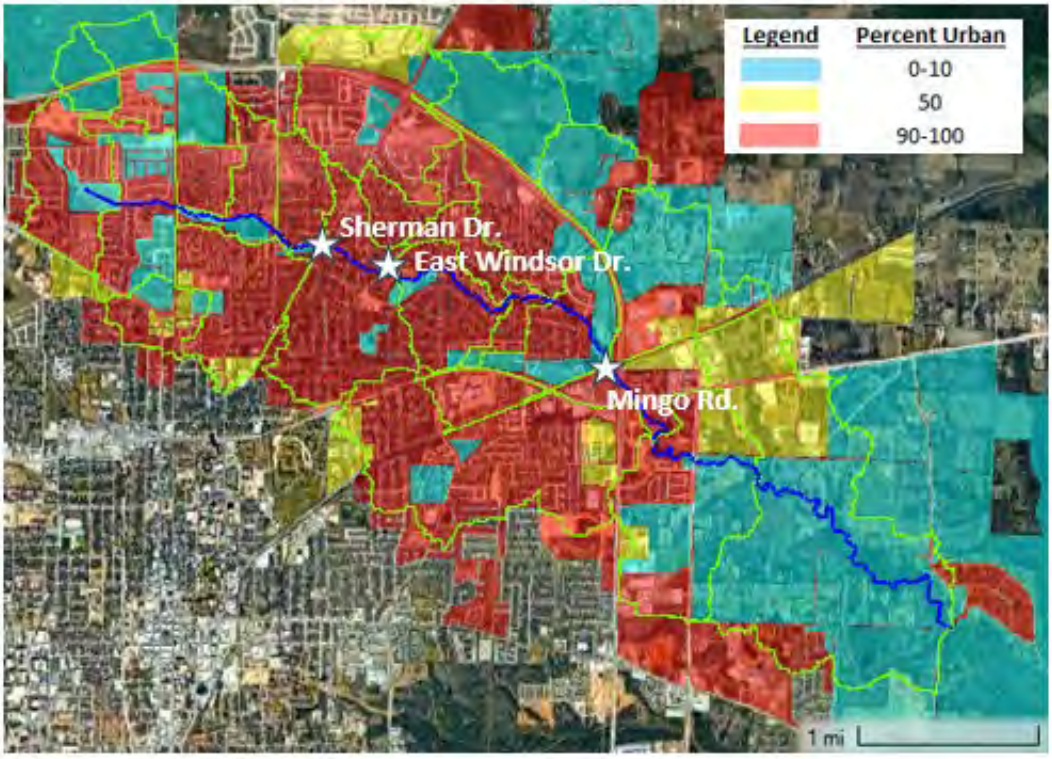
Table 2 Final Percent Urban Values

Subbasin	Area (sq. mi)	Existing	Future	Increase
S_010	0.35	60	78	18
S_020	0.35	75	78	3
S_030	0.10	3	90	87
S_040	0.06	5	91	86
S_050	0.05	20	96	76
S_060	0.24	45	96	51
S_070	0.12	91	91	0
S_080	0.02	34	34	0
S_090	0.16	62	71	9
S_100	0.41	86	86	0
S_110	0.17	76	76	0
S_120	0.17	87	87	0
S_130	0.58	89	89	0
S_140	0.61	72	85	13
S_150	0.17	92	92	0
S_160	0.29	84	86	2
S_170	0.12	92	92	0
S_180	0.31	5	91	86
S_190	0.25	26	91	65
S_200	0.33	83	94	11
S_210	0.08	83	93	10
S_220	0.14	96	96	0
S_230	0.30	51	94	43
S_240	0.44	37	91	54
S_250	0.98	85	90	5
S_260	0.28	76	84	8
S_270	0.70	50	88	38
S_280	1.59	26	81	55

Table 3 Final Percent Impervious Values

Subbasin	Area (sq. mi)	Existing	Future	Increase
S_010	0.35	44	58	14
S_020	0.35	54	55	1
S_030	0.10	3	49	46
S_040	0.06	5	50	45
S_050	0.05	19	75	56
S_060	0.24	39	86	47
S_070	0.12	57	57	0
S_080	0.02	19	19	0
S_090	0.16	45	52	7
S_100	0.41	57	57	0
S_110	0.17	47	47	0
S_120	0.17	54	54	0
S_130	0.58	55	55	0
S_140	0.61	57	69	12
S_150	0.17	58	58	0
S_160	0.29	52	54	2
S_170	0.12	55	55	0
S_180	0.31	5	52	47
S_190	0.25	18	55	37
S_200	0.33	57	68	11
S_210	0.08	56	65	9
S_220	0.14	92	92	0
S_230	0.30	34	74	40
S_240	0.44	33	70	37
S_250	0.98	60	64	4
S_260	0.28	71	75	4
S_270	0.70	43	74	31
S_280	1.59	19	48	29

Existing



Future

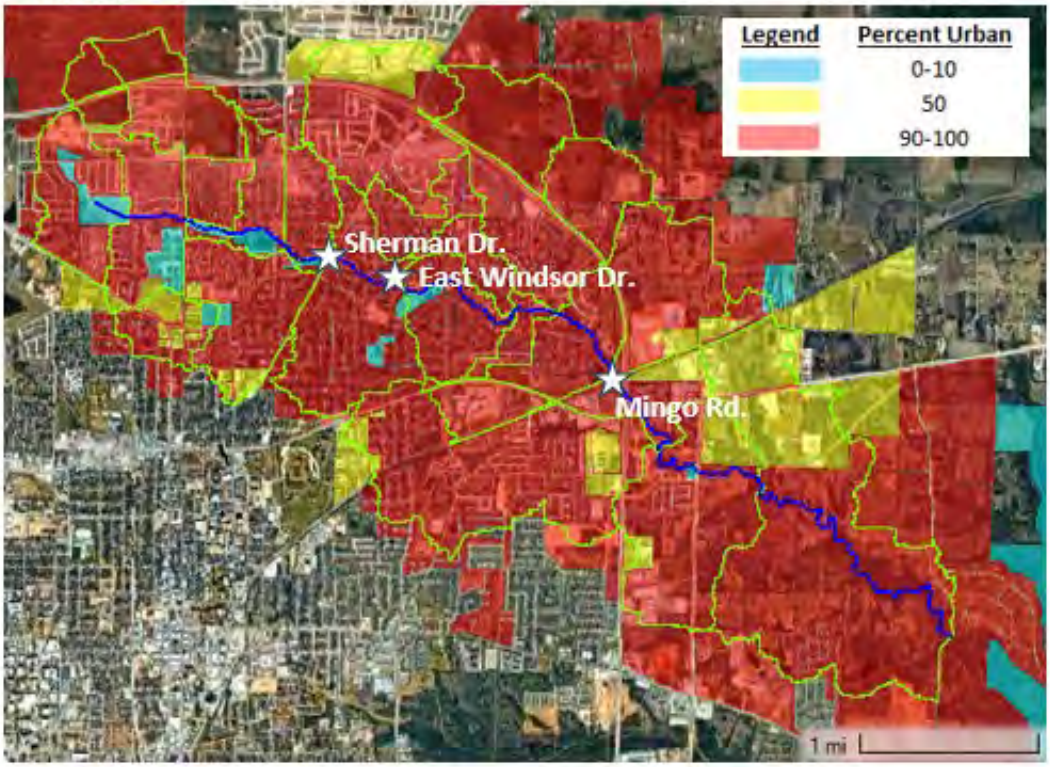


Figure 7 Urbanization Changes from Existing to Future Conditions

2.5 Loss Rates

The initial abstractions and infiltration rates presented below were developed by the USACE Fort Worth District from flood hydrograph reproductions studies in which losses were determined for different soil types (Table 4). The loss rates used to compute the flood frequency estimates for this study varied with percent sand values ranging from 2-100%.

Table 4 Standard Fort Worth District Loss Rates

Annual Exceedance Probability (percent)	Average Recurrence Interval (years)	Clayey Soils		Sandy Soils	
		Initial Abstraction (inches)	Infiltration Rate (inches/hour)	Initial Abstraction (inches)	Infiltration Rate (inches/hour)
50	2	1.50	0.20	2.10	0.26
20	5	1.30	0.16	1.80	0.21
10	10	1.12	0.14	1.50	0.18
4	25	0.95	0.12	1.30	0.15
2	50	0.84	0.10	1.10	0.13
1	100	0.75	0.07	0.90	0.10
0.2	500	0.50	0.05	0.60	0.08

Runoff volumes (excess rainfall amounts) were computed by deducting applicable losses from incremental rainfall amounts. "Block" (initial abstraction) and "uniform" (infiltration rate) losses were applied to all pervious soil surfaces within each subbasin. These losses are based on an analysis originally done in 1957. In this analysis, the initial abstractions and infiltration rates were determined for 10 storm reproductions on the East Fork of the Trinity River near Rockwall, Texas. Losses from these storm reproductions ranged from maximums of 1.30-inch initial abstraction and 0.16-inch per hour infiltration, to minimums of 0.50-inch initial abstraction and 0.05-inch per hour infiltration. Based on these storm reproductions, the 2-year frequency storm was assigned an initial abstraction and infiltration rate of 1.50 inches and 0.20 inch per hour, respectively. The 1000-year frequency storm was assigned an initial abstraction and infiltration rate of 0.50 inches and 0.05 inch per hour, respectively. Losses for the 5-year through 100-year frequency storms were then interpolated. Later studies adopted the "1-year" losses to be the same as those for the 2-year event and the losses for the 500-year and SPF events to be the same as those for the 1000-year event. An additional 30 storm reproductions were used in the development of the Blackland Prairie Clay and Cross Timber Sandy Loam Urbanization in 1970 (Nelson) and 1977 (Rodman). In the analysis of these storm reproductions, it was determined that the losses calculated in 1957 more closely matched those for the watersheds that were predominantly clayey in nature; therefore, they became the "clay" losses. A companion set of "sand" losses were then developed by increasing the "clay" losses, using losses determined from storm reproductions in the sandy watersheds as a guide. Subsequent studies, including streamflow frequency analyses have been used to verify the reasonableness of these losses. These losses were applied during the original Tarrant County and Dallas County FEMA Flood Insurance Studies (FIS) based on the similarity of soils and runoff characteristics. They have also been applied successfully in

studies throughout the state, since they relate to soil type, rather than to a specific geographic region. The final subbasin losses are identified in Table 5 and Table 6.

Table 5 Final Initial and Constant Losses for the 2-year through 25-year Frequency Storms

Return	**Interval**	**2-yr**	**2-yr**	**5-yr**	**5-yr**	**10-yr**	**10-yr**	**25-yr**	**25-yr**
Subbasin Name	Percent Sand	Initial (in)	Constant (in/hr)	Initial (in)	Constant (in/hr)	Initial (in)	Constant (in/hr)	Initial (in)	Constant (in/hr)
S_010	47	1.78	0.23	1.53	0.18	1.30	0.16	1.11	0.13
S_020	39	1.74	0.22	1.50	0.18	1.27	0.16	1.09	0.13
S_030	20	1.62	0.21	1.40	0.17	1.19	0.15	1.02	0.13
S_040	53	1.82	0.23	1.57	0.19	1.32	0.16	1.14	0.14
S_050	58	1.85	0.23	1.59	0.19	1.34	0.16	1.15	0.14
S_060	35	1.71	0.22	1.48	0.18	1.25	0.15	1.07	0.13
S_070	11	1.57	0.21	1.36	0.17	1.16	0.14	0.99	0.12
S_080	2	1.51	0.20	1.31	0.16	1.13	0.14	0.96	0.12
S_090	71	1.92	0.24	1.65	0.20	1.39	0.17	1.20	0.14
S_100	51	1.81	0.23	1.56	0.19	1.31	0.16	1.13	0.14
S_110	17	1.60	0.21	1.38	0.17	1.18	0.15	1.01	0.13
S_120	11	1.56	0.21	1.35	0.17	1.16	0.14	0.99	0.12
S_130	64	1.89	0.24	1.62	0.19	1.36	0.17	1.18	0.14
S_140	9	1.55	0.21	1.34	0.16	1.15	0.14	0.98	0.12
S_150	16	1.60	0.21	1.38	0.17	1.18	0.15	1.01	0.12
S_160	43	1.76	0.23	1.51	0.18	1.28	0.16	1.10	0.13
S_170	15	1.59	0.21	1.38	0.17	1.18	0.15	1.00	0.12
S_180	39	1.73	0.22	1.50	0.18	1.27	0.16	1.09	0.13
S_190	100	2.10	0.26	1.80	0.21	1.50	0.18	1.30	0.15
S_200	24	1.64	0.21	1.42	0.17	1.21	0.15	1.03	0.13
S_210	33	1.70	0.22	1.46	0.18	1.24	0.15	1.06	0.13
S_220	84	2.00	0.25	1.72	0.20	1.44	0.17	1.24	0.15
S_230	28	1.67	0.22	1.44	0.17	1.23	0.15	1.05	0.13
S_240	59	1.85	0.24	1.59	0.19	1.34	0.16	1.16	0.14
S_250	81	1.98	0.25	1.70	0.20	1.43	0.17	1.23	0.14
S_260	25	1.65	0.21	1.42	0.17	1.21	0.15	1.04	0.13
S_270	68	1.91	0.24	1.64	0.19	1.38	0.17	1.19	0.14
S_280	79	1.97	0.25	1.69	0.20	1.42	0.17	1.23	0.14

Table 6 Final Initial and Constant Losses for the 50-year through 500-year Frequency Storms

Return	Interval	50-yr	50-yr	100-yr	100-yr	200-yr	200-yr	500-yr	500-yr
Subbasin Name	Percent Sand	Initial (in)	Constant (in/hr)	Initial (in)	Constant (in/hr)	Initial (in)	Constant (in/hr)	Initial (in)	Constant (in/hr)
S_010	47	0.96	0.11	0.82	0.08	0.66	0.07	0.55	0.06
S_020	39	0.94	0.11	0.81	0.08	0.66	0.07	0.54	0.06
S_030	20	0.89	0.11	0.78	0.08	0.63	0.06	0.52	0.06
S_040	53	0.98	0.12	0.83	0.09	0.67	0.07	0.55	0.07
S_050	58	0.99	0.12	0.84	0.09	0.68	0.08	0.56	0.07
S_060	35	0.93	0.11	0.80	0.08	0.65	0.07	0.54	0.06
S_070	11	0.87	0.10	0.77	0.07	0.62	0.06	0.51	0.05
S_080	2	0.85	0.10	0.75	0.07	0.61	0.06	0.50	0.05
S_090	71	1.02	0.12	0.86	0.09	0.69	0.08	0.57	0.07
S_100	51	0.97	0.12	0.83	0.09	0.67	0.07	0.55	0.07
S_110	17	0.88	0.11	0.78	0.08	0.63	0.06	0.52	0.06
S_120	11	0.87	0.10	0.77	0.07	0.62	0.06	0.51	0.05
S_130	64	1.01	0.12	0.85	0.09	0.69	0.08	0.56	0.07
S_140	9	0.86	0.10	0.76	0.07	0.62	0.06	0.51	0.05
S_150	16	0.88	0.10	0.77	0.07	0.63	0.06	0.52	0.05
S_160	43	0.95	0.11	0.81	0.08	0.66	0.07	0.54	0.06
S_170	15	0.88	0.10	0.77	0.07	0.63	0.06	0.52	0.05
S_180	39	0.94	0.11	0.81	0.08	0.66	0.07	0.54	0.06
S_190	100	1.10	0.13	0.90	0.10	0.73	0.09	0.60	0.08
S_200	24	0.90	0.11	0.79	0.08	0.64	0.07	0.52	0.06
S_210	33	0.93	0.11	0.80	0.08	0.65	0.07	0.53	0.06
S_220	84	1.06	0.13	0.88	0.10	0.71	0.08	0.58	0.08
S_230	28	0.91	0.11	0.79	0.08	0.64	0.07	0.53	0.06
S_240	59	0.99	0.12	0.84	0.09	0.68	0.08	0.56	0.07
S_250	81	1.05	0.12	0.87	0.09	0.71	0.08	0.58	0.07
S_260	25	0.90	0.11	0.79	0.08	0.64	0.07	0.52	0.06
S_270	68	1.02	0.12	0.85	0.09	0.69	0.08	0.57	0.07
S_280	79	1.04	0.12	0.87	0.09	0.70	0.08	0.58	0.07

2.6 Point Precipitation Volume Reduction

NOAA Atlas 14 precipitation point values were not reduced for this study due to the relatively small drainage area (2-3 square miles) of the primary damage area between Sherman Drive and East Windsor Drive. The precipitation volume would be reduced less than 1% if area reduction was added.

2.7 Unit Hydrograph Parameters

Synthetic unit hydrograph parameters were developed for each subbasin based on specific physical measurements, as listed in Table 7. Flowpath/stream forcing was incorporated where aerial imagery, National Hydrography Dataset (NHD) or City storm drain data supported a different flowpath than the flowpath resulting from the raw LiDAR. Unit hydrograph lag times (Tp's) were derived for each subbasin using methodology described in the following reports:

"Synthetic Hydrograph Relationships, Trinity River Tributaries,
Fort Worth-Dallas Urban Area", T.L. Nelson, dated 1970.

"Effects of Urbanization on Various Frequency Peak Discharges",
Paul K. Rodman, dated October 1977.

Each of these reports discuss the development of the previously mentioned Blackland Prairie Clay and Cross Timber Sandy Loam urbanization curves for the general Dallas-Fort Worth vicinity of Texas. These curves relate Tp to certain measurable subbasin parameters for a specific percent urbanization and soil type (percent sand). Each set of curves was based on flood hydrograph reproductions of predominantly clayey or sandy watersheds in the Dallas-Fort Worth area. These curves have been successfully applied to a number of flood insurance and planning studies in Texas with satisfactory results. The urbanization curves relate Tp to the quantity:

Tp = 10^(0.3833log (L*Lca/(Sst ^ .5))+(Sand*(log1.81-log.92)+log.92)-(BW*Urban./100))

where: **Tp** = the lag time in hours from the midpoint of the unit rainfall duration to the peak of the unit hydrograph

L = the stream mileage from the discharge point to the upstream limits of the drainage subbasin

Lca = the stream mileage from the discharge point to the geographical centroid of the drainage subbasin

Sst = the weighted stream slope over the stream length, from 10 percent of L to 85 percent of L, above the discharge point, in feet per mile.

Sand = percentage sand (0-Clay, 100-Sand), as determined from permeability rates.

BW = log(tp) bandwidth between 0% and 100% urbanization

Based on the percentages of clay and sand, the Tp value was computed for each subbasin by interpolating between the Blackland Prairie Clay and Cross Timber Sandy Loam urbanization curves. A generalized Snyder's unit hydrograph peaking coefficient of 0.72 was obtained from data developed during the generation of the urbanization curves, was applied in this study area. The unit hydrograph data for each subbasin are presented in Table 7.

Table 7 Watershed Characteristics and Existing and Future Lag Times

Subbasin	Area (sq. mi.)	Length (mi)	Length to Centroid (mi.)	Weighted Stream Slope (ft/mi)	Existing Lag Time (hrs)	Future Lag Time (hrs)
S_010	0.35	1.10	0.25	42.56	0.26	0.23
S_020	0.35	0.99	0.29	53.96	0.22	0.21
S_030	0.10	0.80	0.40	53.22	0.31	0.18
S_040	0.06	0.46	0.15	53.96	0.21	0.12
S_050	0.05	0.42	0.19	71.17	0.20	0.13
S_060	0.24	1.11	0.41	47.41	0.31	0.23
S_070	0.12	0.74	0.29	29.73	0.16	0.16
S_080	0.02	0.37	0.17	52.11	0.12	0.12
S_090	0.16	0.89	0.38	51.64	0.32	0.30
S_100	0.41	1.29	0.45	59.03	0.29	0.29
S_110	0.17	1.18	0.45	47.78	0.24	0.24
S_120	0.17	0.96	0.52	40.81	0.22	0.22
S_130	0.58	1.22	0.28	66.42	0.24	0.24
S_140	0.61	1.94	0.69	23.71	0.38	0.35
S_150	0.17	0.69	0.17	45.46	0.12	0.12
S_160	0.29	1.17	0.38	56.97	0.25	0.24
S_170	0.12	0.86	0.43	41.40	0.19	0.19
S_180	0.31	0.98	0.37	67.64	0.35	0.21
S_190	0.25	0.84	0.22	66.05	0.36	0.24
S_200	0.33	1.65	0.58	41.98	0.31	0.29
S_210	0.08	0.93	0.29	53.64	0.20	0.18
S_220	0.14	0.95	0.46	48.31	0.31	0.31
S_230	0.30	1.19	0.15	63.31	0.19	0.15
S_240	0.44	1.55	0.92	30.94	0.65	0.47
S_250	0.98	2.34	1.18	37.33	0.70	0.68
S_260	0.28	1.92	1.02	23.02	0.48	0.46
S_270	0.70	1.55	0.54	26.51	0.54	0.43
S_280	1.59	3.53	1.51	18.06	1.46	1.04

2.8 Hydrograph Routing

Once precipitation, losses, and transform parameters were developed for the HEC-HMS model, multiple flood hydrographs were generated for each subbasin. Flood hydrographs were routed and combined using 2 Dimensional (2D) HEC-RAS simulations.

2.9 Discharge-Frequency Relationships

As mentioned previously, the precipitation runoff process for the watershed was modeled using the HEC-HMS model and 2D HEC-RAS model. Flow hydrographs for each subbasin were computed within HEC-HMS and then applied in HEC-RAS as internal boundary conditions. These hydrographs were combined and then routed downstream. Peak discharges (Existing (2024) Conditions) for various locations through the study area are identified in Table 8. For this study the existing condition discharges were assumed to be the same as the future without-project discharges since the majority of the upper half of the watershed is already developed. A sensitivity test was performed for the 100-yr event and resulted in a 0.1 feet elevation increase near Sherman Drive between the existing conditions and future without-project conditions. The City of Denton identified that the primary areas of flooding concern were upstream of Mingo Rd and as a result less detail was given to the analysis below Mingo Rd. For example, there were no hydraulic structures added to HEC-RAS for improved hydrograph routing and flood elevations. As a result, peak discharge reporting is only included above Mingo Rd. Peak discharges are also compared with previous studies in Figure 8 and Figure 9. In general, the peak discharges from the current study are higher than the currently effective FEMA FIS discharges but lower than the USACE peak discharges developed during previous studies. The differences can be attributed to changes in urbanization/imperviousness, reduction in precipitation depths, regional detention, and differences in hydrologic and hydraulic methods and technology.

Table 8 Summary of Existing Condition Peak Discharges

		Annual Chance (%)							
		50	20	10	4	2	1	0.5	0.2
				Return	Period	(year)			
Location	**Area (sq. mi.)**	**2**	**5**	**10**	**25**	**50**	**100**	**200**	**500**
Below Regional Pond 1	0.35	160	190	210	230	240	250	270	290
Above CC Trib 15	0.72	590	940	1,100	1,280	1,420	1,550	1,680	1,870
Below CC Trib 15	1.28	960	1,560	1,920	2,280	2,540	2,750	2,960	3,210
At Sherman Dr.	2.19	1,810	2,750	3,300	3,890	4,410	4,900	5,350	5,900
Below Stream CC 2	3.96	3,010	4,430	5,150	5,930	6,580	7,220	7,890	8,870
At Mingo Rd.	5.80	3,390	5,340	6,450	7,520	8,300	9,080	9,890	11,000

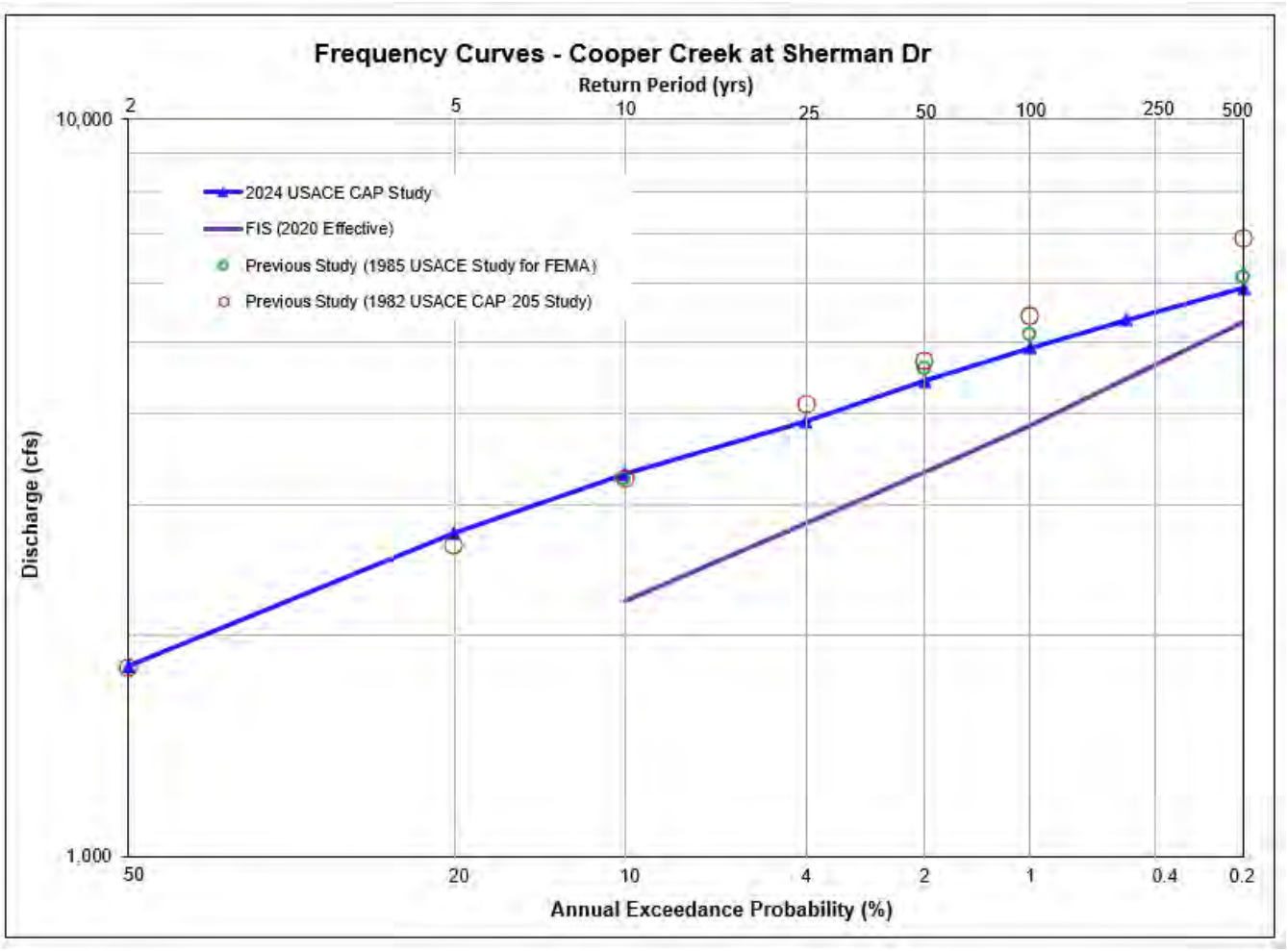


Figure 8 Peak Discharge Frequency Curve for Cooper Creek at Sherman Drive

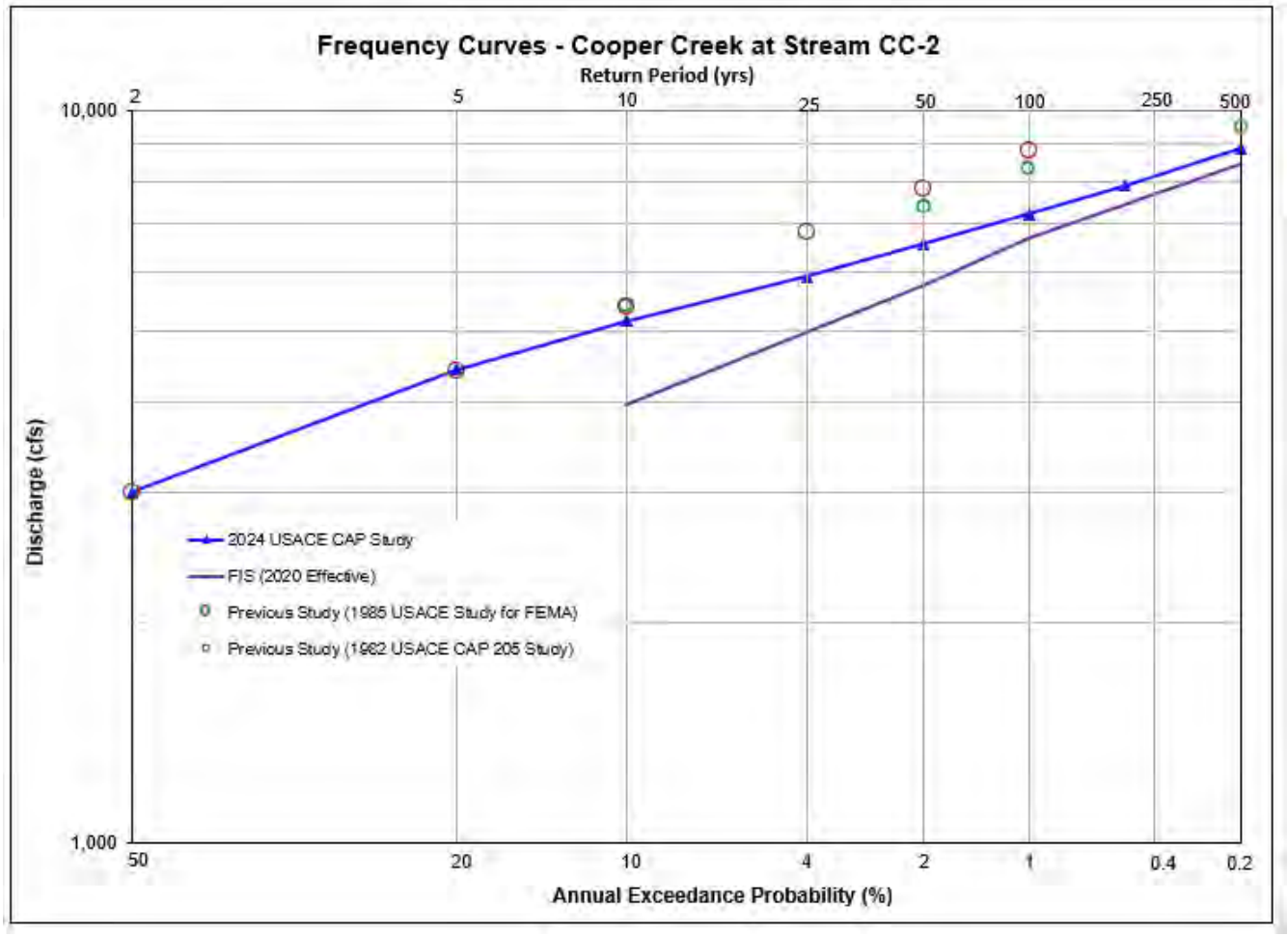


Figure 9 Peak Discharge Frequency Curve for Cooper Creek below Stream CC-2

3.0 HYDRAULIC ANALYSIS

A detailed hydraulic analysis of the Cooper Creek watershed was performed to develop inundation areas and flood depths for the Cooper Creek watershed for without-project conditions. Inundation areas and flood depths were developed for the 50, 20, 10, 4, 2, 1, 0.5 and 0.2% annual chance storms or storms that have recurrence intervals of 2, 5, 10, 25, 50, 100, 200 and 500 years, respectively. For this study the existing condition discharges were assumed to be the same as the future without-project discharges since the majority of the upper half of the watershed is already developed. A sensitivity test was performed for the 100-yr event and resulted in a 0.1 feet elevation increase near Sherman Drive between the existing conditions and future without-project conditions. The 100-yr flood is defined as the flood which has a 1% chance of occurring in any year. The hydraulic analysis was performed using HEC-HMS version 4.12 and HEC-RAS version 6.5. HEC-HMS was used to compute flow hydrographs for individual subbasins while HEC-RAS was used to combine and route the subbasin hydrographs. The HEC-RAS modeling was performed using 2D unsteady flow analysis.

3.1 Model Geometry Development

The study area was analyzed using HEC-RAS (version 6.5) 2D due to complex flowpaths (Figure 10), hydrograph routing that is more physically based than simplified hydrologic routing methods, and for the benefit of efficiently developing alternatives without the need to add cross sections. The elevation data was developed using 1m StratMap LiDAR (North & Central Texas) terrain data. The terrain data was reprojected into the NAD 1983 State Plane Texas North Central FIPS 4202 (feet) coordinate system. All elevations were measured from the NAVD 88 (feet).

Figure 10 Complex Flow Paths

Generally, a 100-foot grid cell size was used to create the HEC-RAS 2D mesh. A smaller grid cell size of 50-feet was tested and resulted in a significant (5 minute to 30 minute) increase in model simulation time and small difference (1-2 inches) in water surface elevation. Breaklines were added to represent major stream centerlines and were then burned or forced into the mesh. Breaklines were also utilized to represent high points on the terrain such as embankments that either restrict flow or prevent flow. The extents of the 2D area and associated grid cells can be seen in Figure 11.

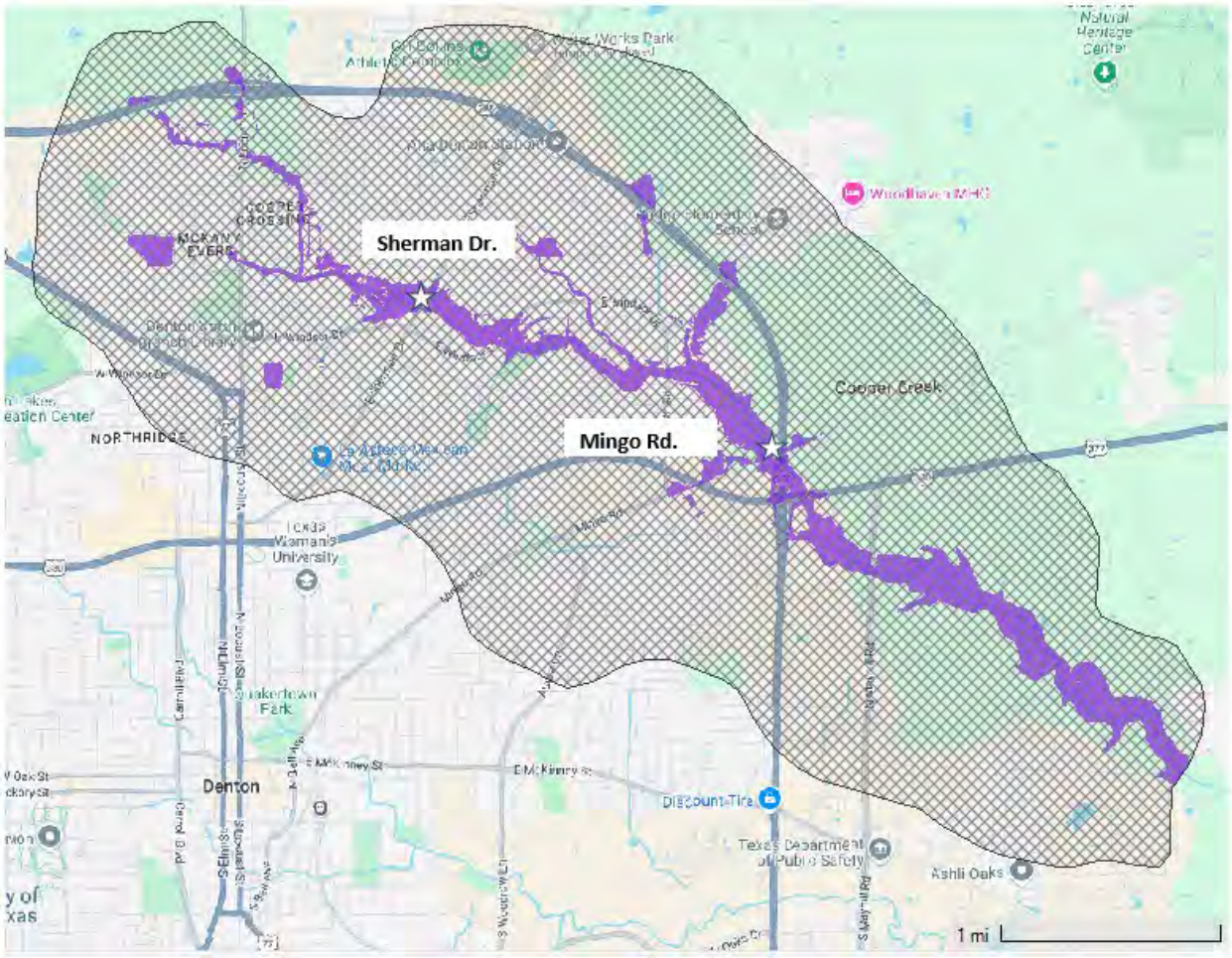


Figure 11 HEC-RAS Model Extents

The Multi-Resolution Land Characteristics Consortium (MRLC) 2021 National Land Cover Dataset (NLCD) was utilized to create the base Manning's n values for the 2D cells. The NLCD dataset was used to estimate Manning's n values primarily because, it was observed to have additional detail that was more appropriate in some areas in determining manning's n values for the floodplain over the land use data provided by the NFS. For example, the "Parks/Open" space land use type in the dataset provided by the NFS includes grassland as well as forest, which have very different manning's n values (i.e. 0.04 vs 0.15). The NLCD separates grassland and forest into separate land use categories so appropriate roughness values can be represented. Figure 12 illustrates how the NLCD land use and associated manning's values vary spatially. Figure 13 illustrates how the NFS land use type "Parks/Open" space can include different land use types that have different manning's values.

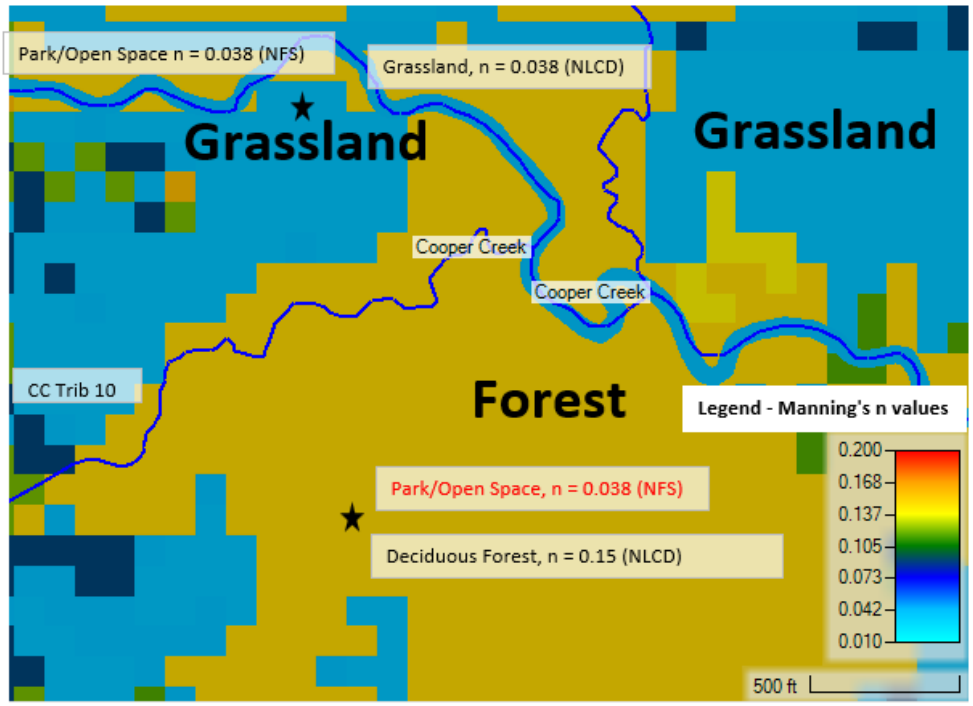


Figure 12 NLCD land use types and Manning's n assignment

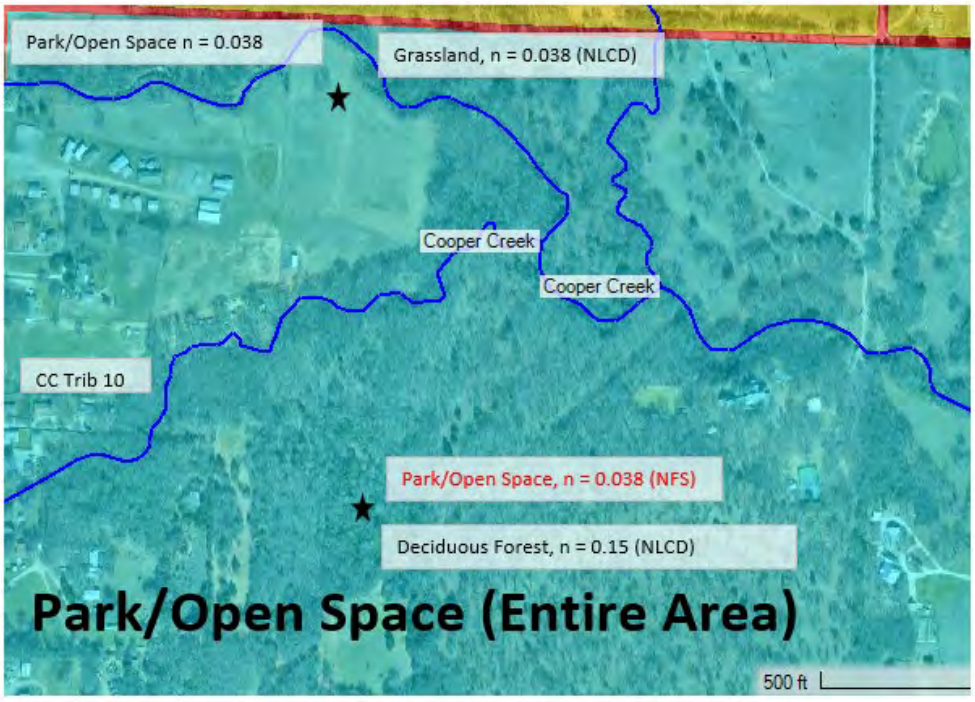


Figure 13 NFS Land Use Type and Manning's n assignments

Manning's n values for the channel were also created that would be used in place of base values from the NLCD data. Channel values of 0.04 and 0.015 were used for the earthen channel and concrete channel portions respectively. The base Manning's n values were assigned based on average Manning's n values assigned to each NLCD land used description from HEC-RAS 2D User's Manual. Table 9 indicates the base values that were assigned for each land use type.

Table 9 Assigned Manning's n Values for NLCD Land Use

NLCD Land Use Description	Assigned Manning's n Value	Minimum (2D User's Manual)	Maximum (2D User's Manual)
NoData	0.06		
Grassland-Herbaceous	0.0375	0.025	0.05
Pasture-Hay	0.0375	0.025	0.05
Open Water	0.0375	0.025	0.05
Developed, Open Space	0.04	0.03	0.05
Developed, Medium Intensity	0.12	0.08	0.16
Developed, Low Intensity	0.09	0.06	0.12
Barren Land Rock-Sand-Clay	0.0265	0.023	0.03
Cultivated Crops	0.035	0.02	0.05
Deciduous Forest	0.15	0.1	0.2
Shrub-Scrub	0.115	0.07	0.16
Woody Wetlands	0.0975	0.045	0.15
Emergent Herbaceous Wetlands	0.0675	0.05	0.085
Developed, High Intensity	0.16	0.12	0.2
Mixed Forest	0.14	0.08	0.2
Evergreen Forest	0.12	0.08	0.16

3.2 Stream Crossings

Using the SA/2D Area Hydraulic Connection feature, the existing bridges and culverts were added to the model using a combination of data from studies previously performed in the watershed as well as field measurement. Elevations for the field measured crossings were established by combining crossing measurements with the 1m Lidar data which accurately provided road elevations immediately adjacent to the stream crossing as well as channel invert elevations. For study purposes, it was assumed that no debris effects would alter bridge openings during flood stages.

Culverts, bridges, and selected detention pond hydraulic structures were modeled as SA/2D Area connections. SA/2D Area connections are model elements that hydraulically connect internal and external model elements. These connections were used inside of the same 2D area to define key urban features (e.g., embankments, culverts, and bridges). Every crossing in Cooper Creek was not modeled in HEC-RAS but only those considered most important for flood hydrograph routing and water surface elevation computation through the primary damage area. A list of the SA/2D Connections in the HEC-RAS model is included in Table 10. A plan and profile view of the Windsor Drive crossing is shown in Figure 14 as an example.

Table 10 List of SA/2D Connections

Crossing Name	**Stream Name**
Loop 288	CC Tributary 11 Tributary
Strickland Detention Pond	CC Tributary 13
Loop 288	CC Tributary 15
Loop 288	CC Tributary 15 Tributary
Regional Detention Pond #1	Cooper Creek
Sherman Dr.	Cooper Creek
Stuart Rd.	Cooper Creek
Windsor Dr.	Cooper Creek
Kings Row	Stream CC-2

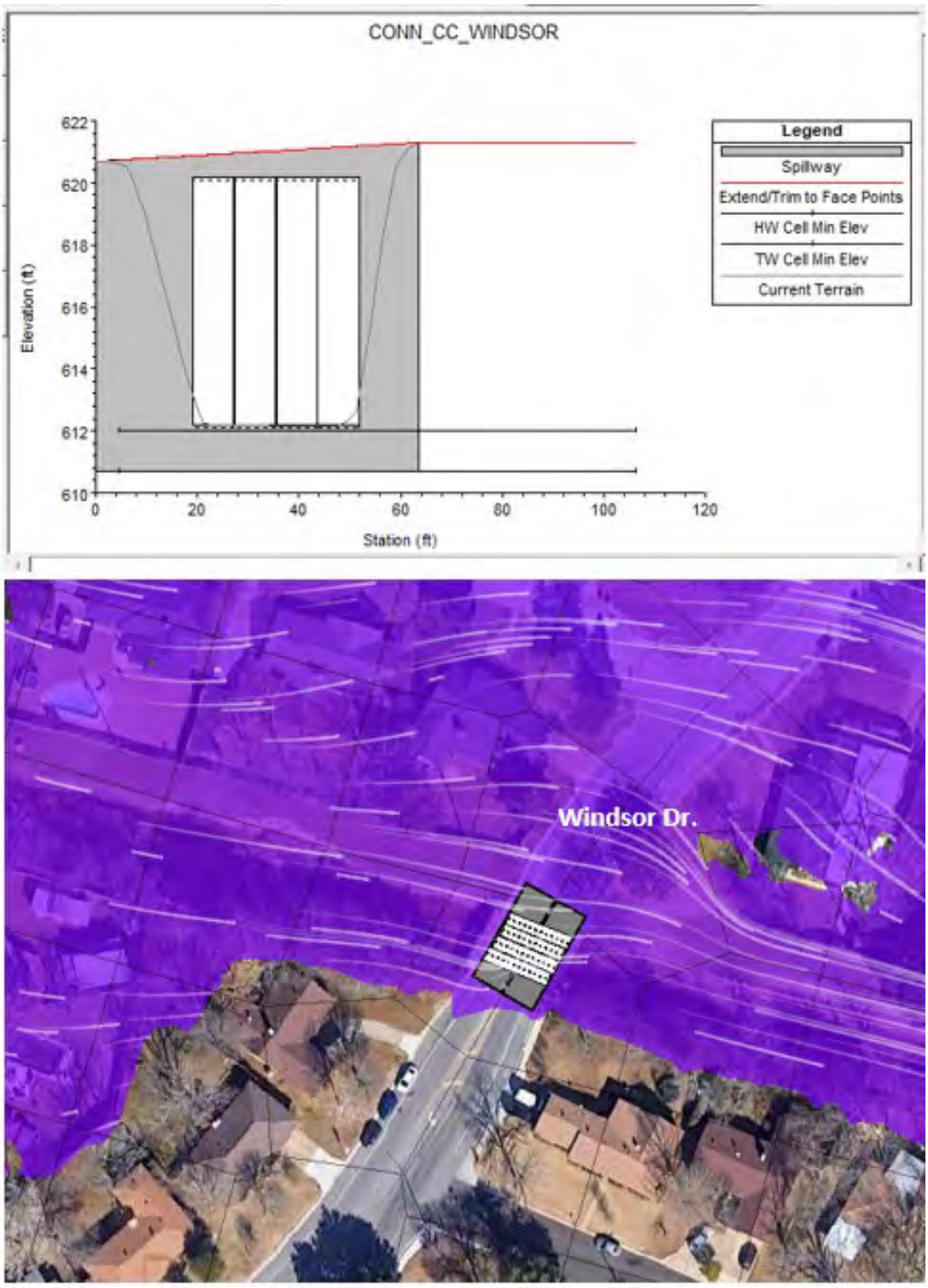


Figure 14 Plan and Profile View of Windsor Dr. SA/2D Connection

3.3 Boundary Conditions

The downstream boundary condition to determine the starting water surface elevations for Cooper Creek approximately 5 miles downstream of Sherman Drive was established using a normal depth slope of 0.002. The results in the study area are not sensitive to changes in the downstream boundary assumption with an elevation change of around 100 feet from the downstream end to Sherman Drive.

Flow hydrographs for each subbasin were computed within HEC-HMS and were then added into the HEC-RAS 2D flow area using internal boundary conditions. These hydrographs were then routed through the HEC-RAS model using the 2D unsteady flow Diffusive Wave equations.

3.4 Description of HEC-RAS Plans

Table 11 contains a brief description of the alternatives within the HEC-RAS model and identifies the HEC-RAS plan files associated with each alternative. Each alternative has 8 separate plan files representing the 2-yr, 5-yr,10 -yr, 25-yr, 50-yr, 100-yr, 200-yr, and 500-yr events.

Table 11 HEC-RAS Plan Files for Alternatives

Alternative	**Description**	**HEC-RAS Plan Files (.pXX)**
WOP1	Without-Project Condition	09 - 16
2A1	Detention above Sherman	17 - 24
2C1	Detention above Stuart (elev 637)	74 - 81
2D1	Detention above Stuart (elev 634)	82 - 89
3A1	Detention (2C1) + channelization at Windsor Dr.	03 - 08, 30,31
5A1	Detention (2C1) and bridge improvement at Sherman Dr.	40 - 47
8A1	Channelization and bridge improvement at Windsor Dr.	25 - 29, 71 - 73
17A1	Detention (2C1) + bridge improvement (8A1) + channelization (8A1)	32 - 39

4.0 PLAN FORMULATION

The goal of plan formulation was to determine if there was an economically and technically feasible structural, non-structural, or combined plan for reducing flood risk on Cooper Creek in Denton, TX. The non-structural plans did not require any additional H&H modeling. The structural plans were evaluated by making modifications to the hydraulic model such as increases to floodplain storage or conveyance and/or increases to hydraulic structure conveyance for the purpose of reducing water surface elevations and associated flood risk. The first step was to identify an economic damage reach. Based on previous USACE studies and input from the NFS, the primary areas of flooding concern were along Cooper Creek above Mingo Rd. During development of existing conditions modeling, a significant number of structures, between 0.25 – 1.0 mile upstream of the NFS identified area (Between Stuart Rd. and Windsor Dr.), were experiencing economic damages in the 10-year to 25-year floodplains as well. After the primary areas of flooding concern were identified, the watershed was investigated to determine economically feasible opportunities to reduce flood risk. Much of the watershed has been developed and locations to implement flood risk management measures was limited.

The Project Delivery Team (PDT) identified several alternatives and combinations of alternatives to investigate for flood risk management feasibility. The alternatives were then represented in the hydraulic model where hydrologic and hydraulic information was used to help determine economic benefits.

An economic analysis was developed for the structural alternatives. This required determining the costs associated with constructing the structural changes such as: purchasing real estate, excavation/hauling/disposal, and culvert improvements/enlargements. Preliminary costs were calculated, and Flood Damage Analysis (HEC-FDA) was run to obtain the Expected Annual Damages (EADs). A ratio of benefits over costs (B/C ratio) and net benefits were calculated for the structural alternative. The analysis resulted in the determination that all of the structural alternatives considered would produce a B/C ratio less than one. Cost and benefit details are located in the economic appendix of the study report.

Unless flood risk management measures are implemented, flooding is expected to continue. Measures investigated included detention, channel improvement, and bridge/culvert improvement, in different combinations. The alternatives that were analyzed will be described in the following section.

4.1 Structural Alternative Details

2A1 (Detention above Sherman Drive)

This alternative sought to utilize land already owned by the City of Denton and minimize impacts to the environment. An area approximately 500 feet wide and 100 feet long was excavated (4,800 cubic yards) from park area upstream of Sherman Drive. Figure 15 shows the location of alternative 2A1.

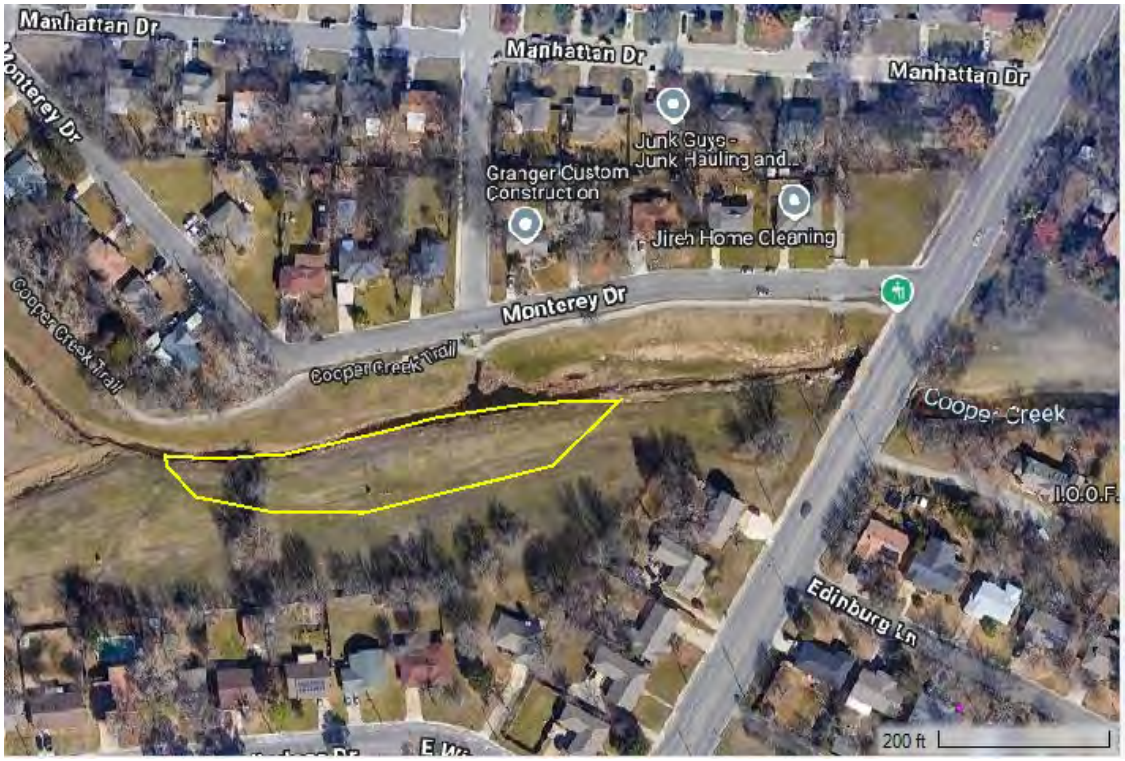


Figure 15 Location of alternative 2A1

This alternative added some floodwater storage capacity in the right overbank. 2A1 included up to 6 feet of excavation in the right overbank. To minimize impacts to the environment, this alternative will use native grass plantings. A sample section of this alternative is included in Figure 16.

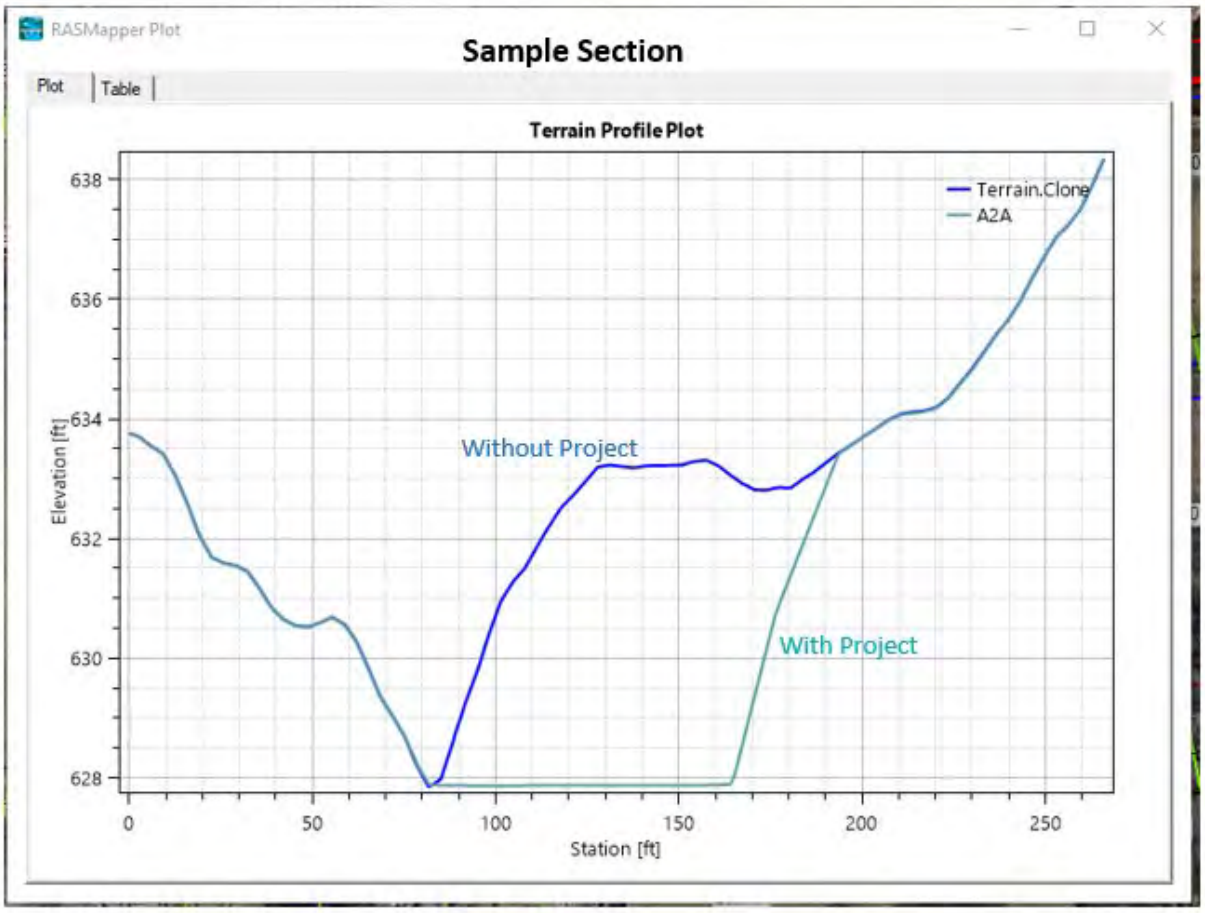


Figure 16 Sample section from alternative 2A1

2A1 resulted in a maximum water surface elevation reduction of about 0.5 feet over a small stretch of Cooper Creek upstream of Sherman Drive but did not reduce the water surface elevation between Sherman Drive. and Windsor Dr.ive where several homes are located within the floodplain. Figure 17 and Figure 18 shows how much the 25-year and 100-years water surface elevation was reduced by alternative 2A1. Figure 19 and Figure 20 compare the without-project floodplain and the alternative 2A1 floodplain for the 25-year and 100-year events.

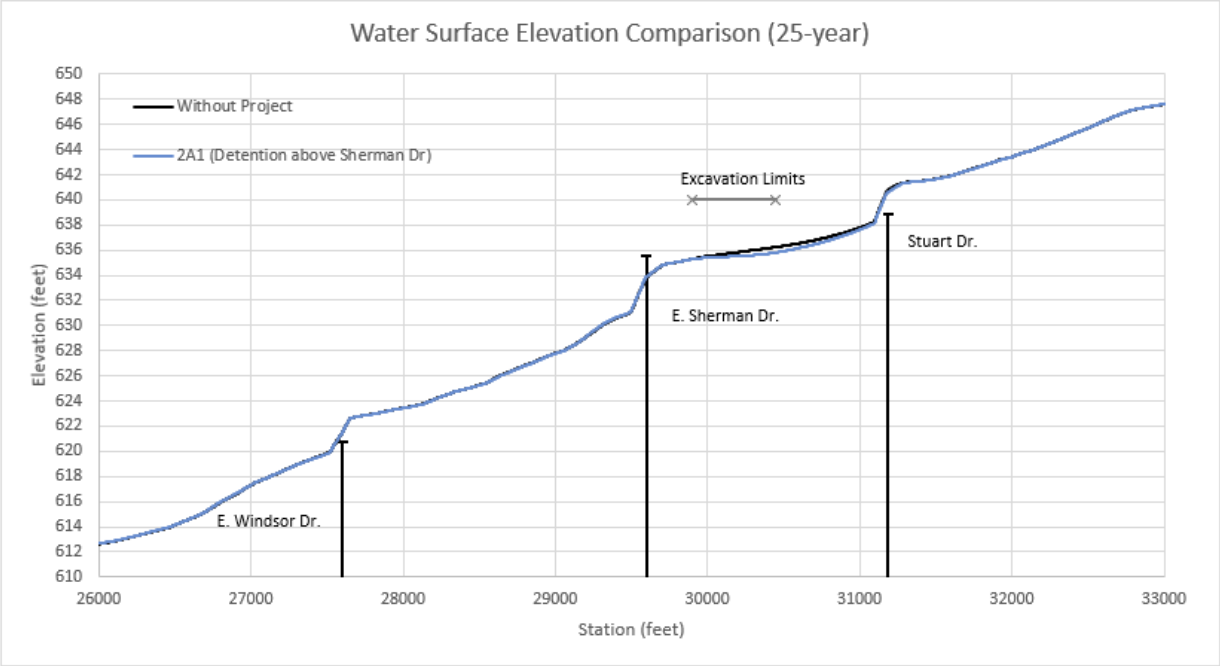


Figure 17 Water surface elevation reduction for alternative 2A1 (25-year event)

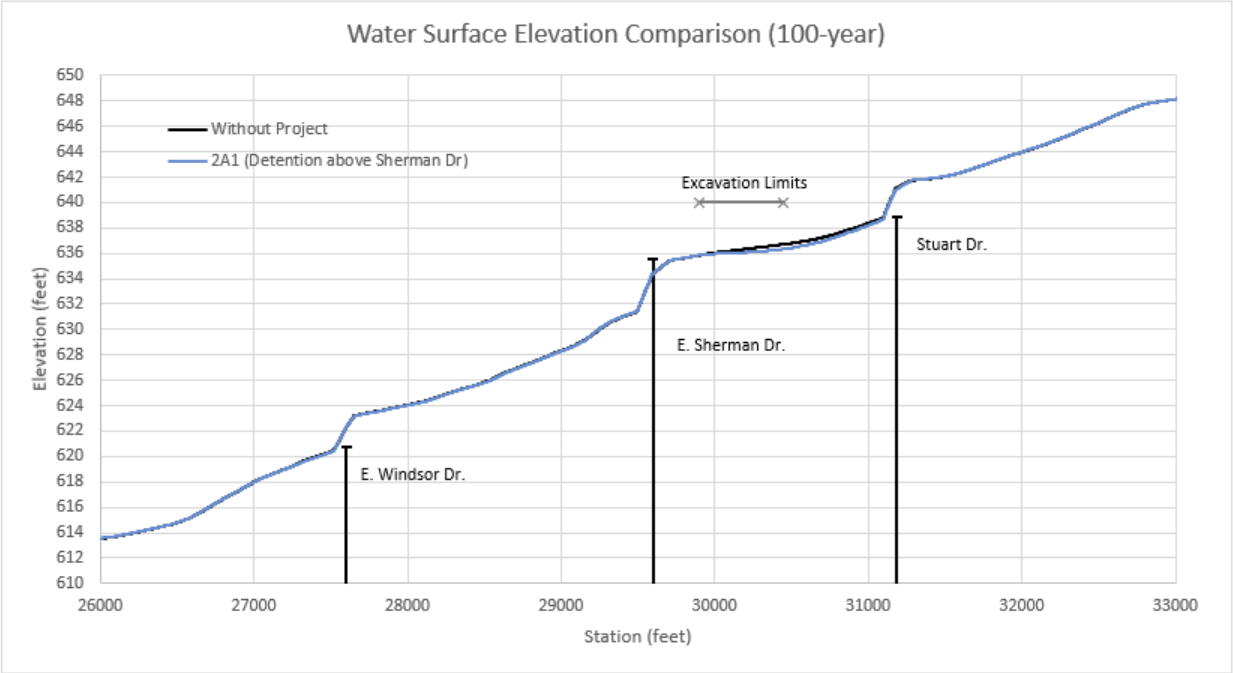


Figure 18 Water surface elevation reduction for alternative 2A1 (100-yr event)

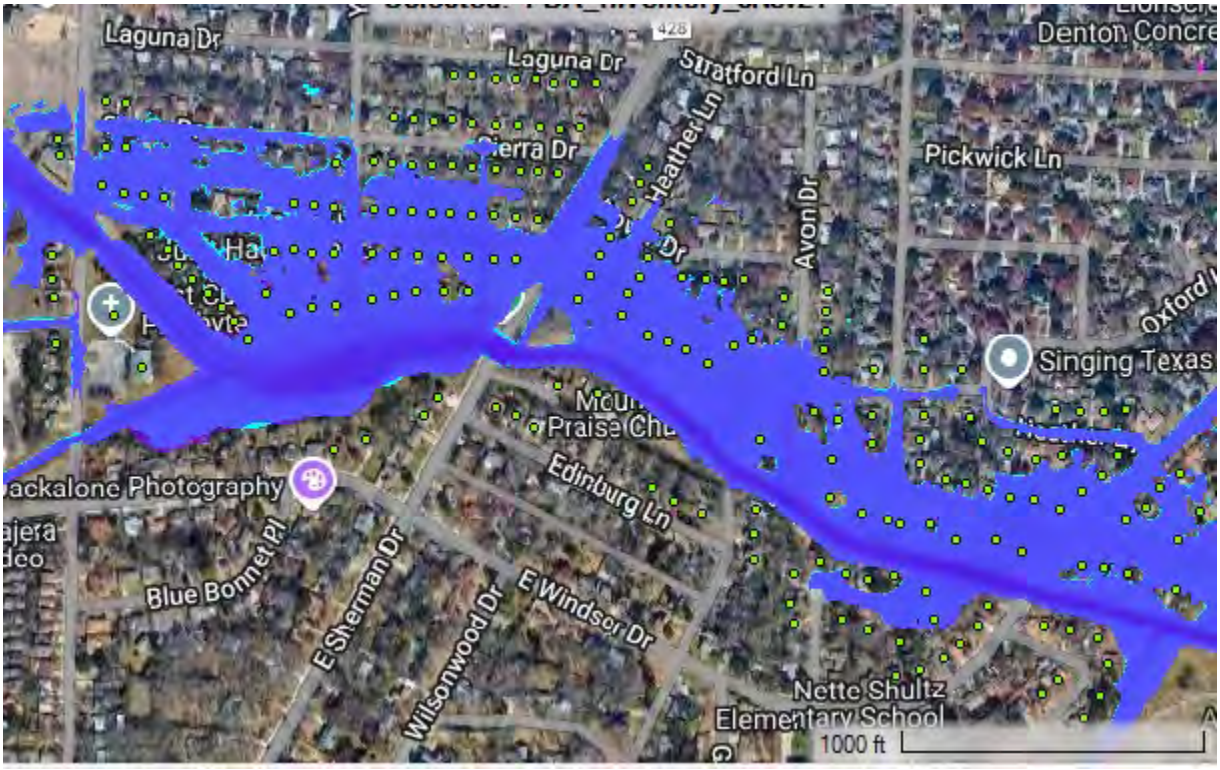


Figure 19 25-year event without-project (Purple) and alternative 2A1 (Blue) floodplain

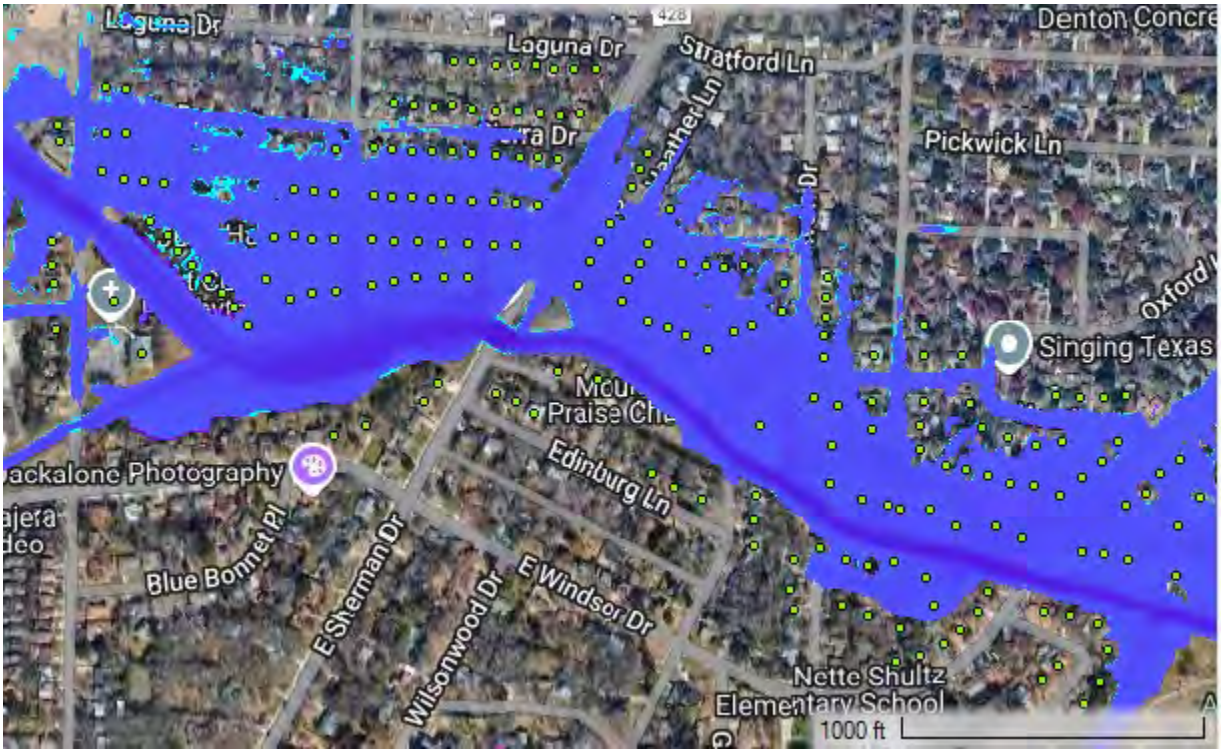


Figure 20 100-year event without-project (Purple) and alternative 2A1 (Blue) floodplain

2C1 (Detention above Stuart Road, elevation 637 feet)

This alternative sought to utilize a large area of undeveloped land upstream of Stuart Rd. This area is not owned by the City of Denton and will result in more environmental impacts due to existing trees, however this area has a significant amount of volume that could be used for floodwater storage. Figure 21 shows the location of alternative 2C1.

Figure 21 Location of alternative 2C1

About 9 acres of land was excavated to elevation 637 feet and resulted in an average excavation depth of 7 feet (Total excavation volume is 106,000 cubic yards). The alternative would include an earthen weir approximately 850 feet in length cut to an elevation of 640.5 feet which would optimize the flood storage of the peak of flood hydrograph. The elevation could be increased or decreased to focus flood shaving for different events, but the 25-year event was the event that was selected as a compromise between frequent flood events like the 10-year event and more infrequent flood events like the 100-year. The alternative also includes a pipe at the downstream end to drain the detention area. This

detention alternative meets study objectives but also provides environmental benefits through creation of new fluvial floodplain area (Nature Based Solution) and native grass plantings. A sample section of this alternative is included in Figure 22.

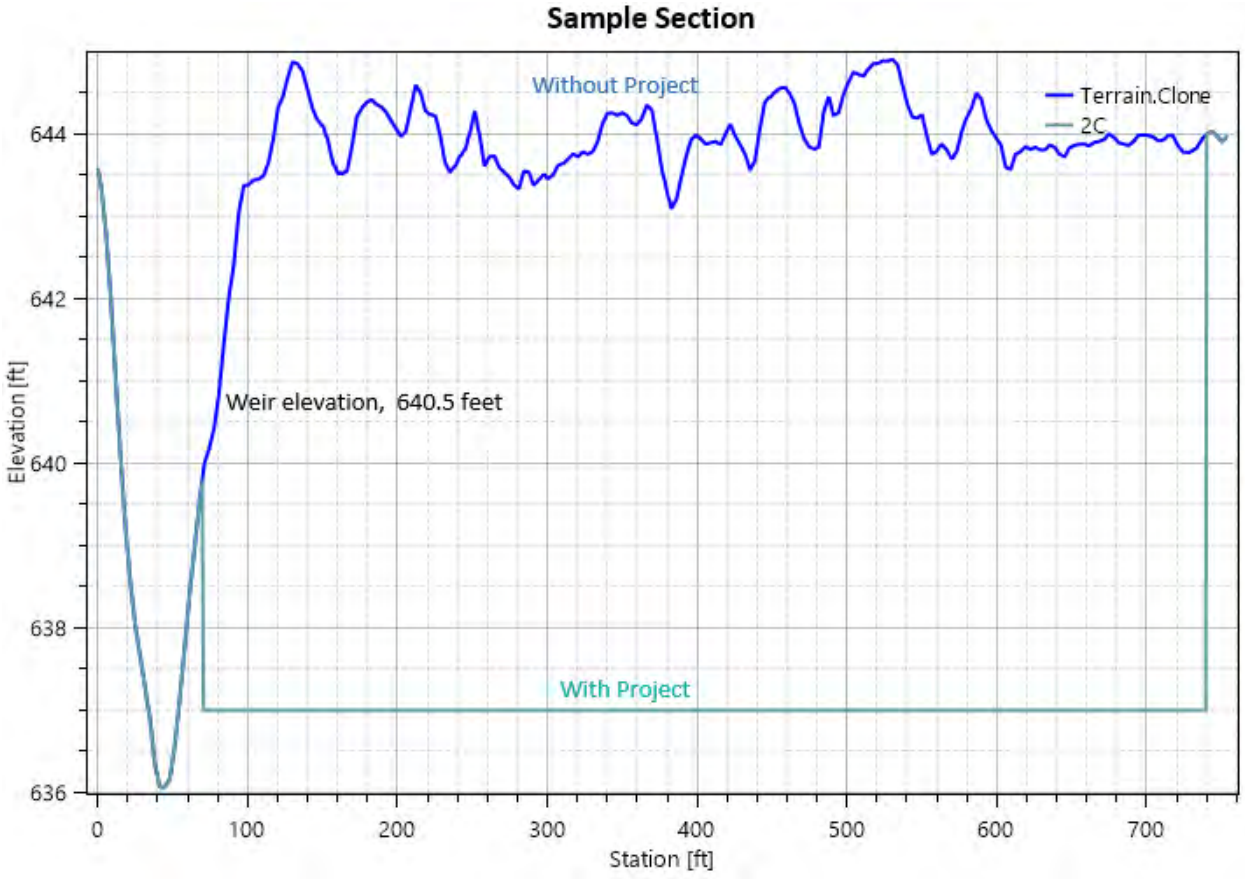


Figure 22 Sample section from alternative 2C1

2C1 resulted in a reduction of discharges due to the flood storage capacity. The reduction in flow resulted in a maximum water surface elevation reduction of about 1.4 feet (25-year event) with structures along a large portion of Cooper Creek benefitting from the alternative due to the reduced discharges. Figure 23 and Figure 24 shows how much the 25-year and 100-year water surface elevation was reduced by alternative 2C1. Figure 25 and Figure 26 compare the without-project floodplain and the alternative 2C1 floodplain for the 25-year and 100-year events.

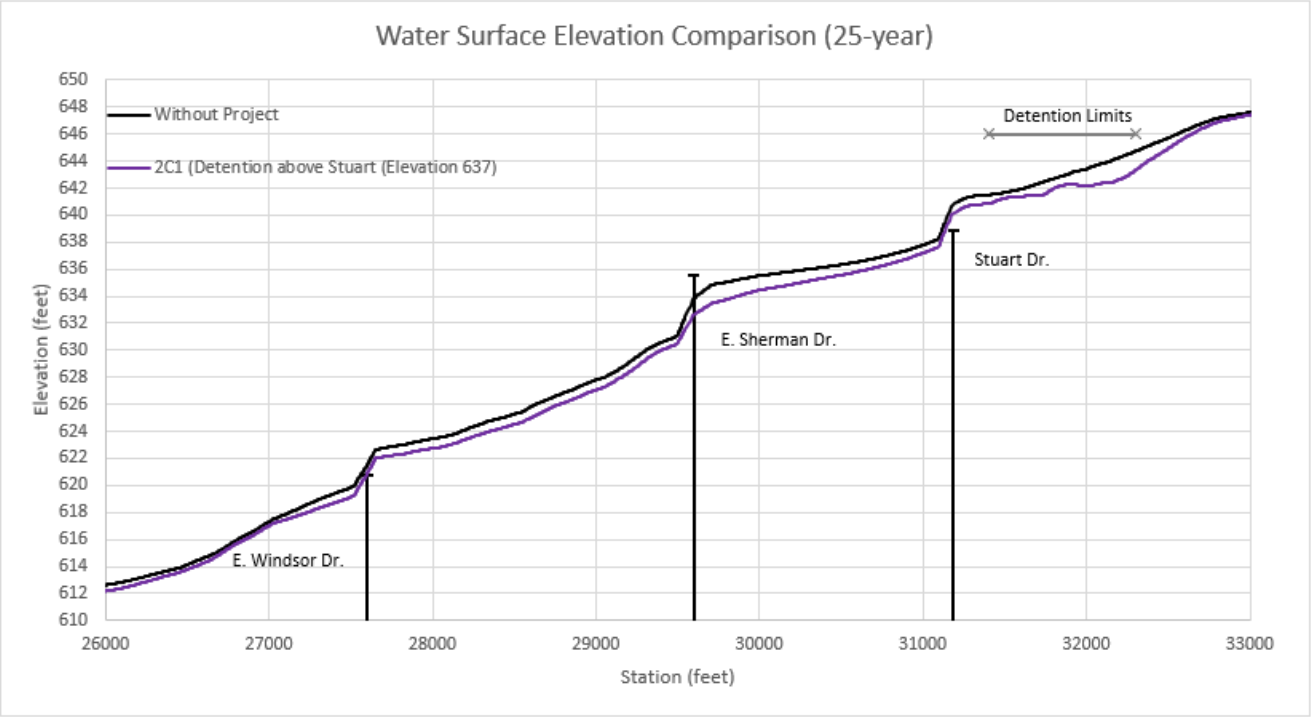


Figure 23 Water surface elevation reduction for alternative 2C1 (25-year event)

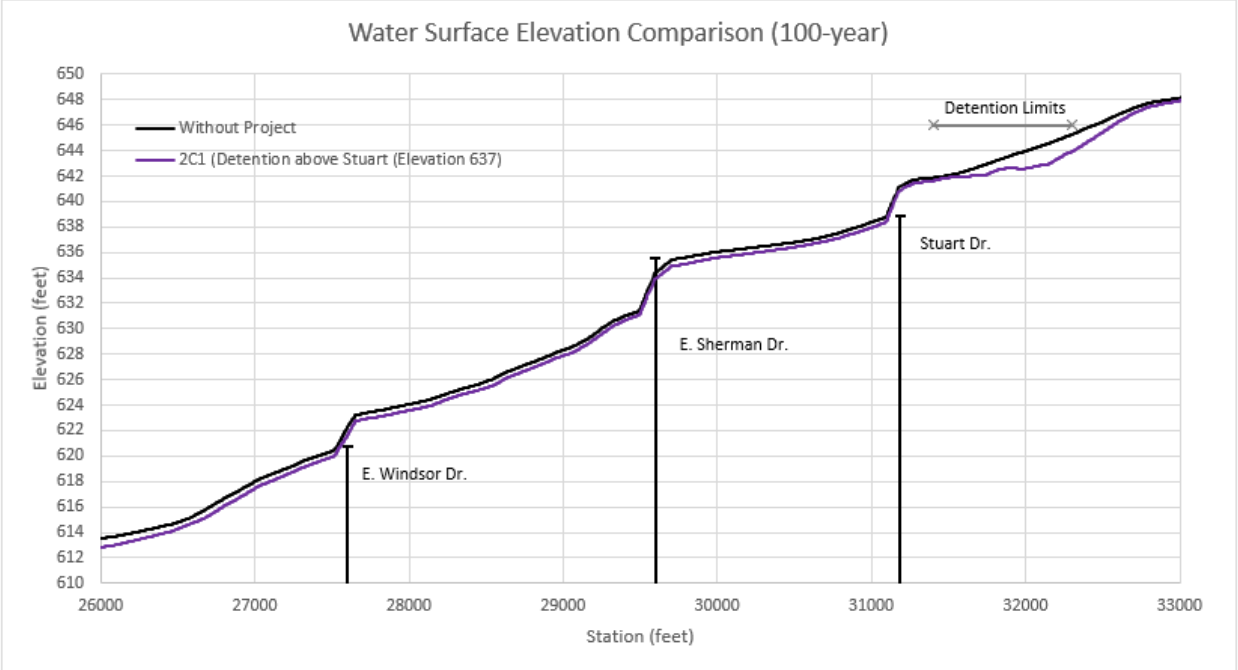


Figure 24 Water surface elevation reduction for alternative 2C1 (100-year)

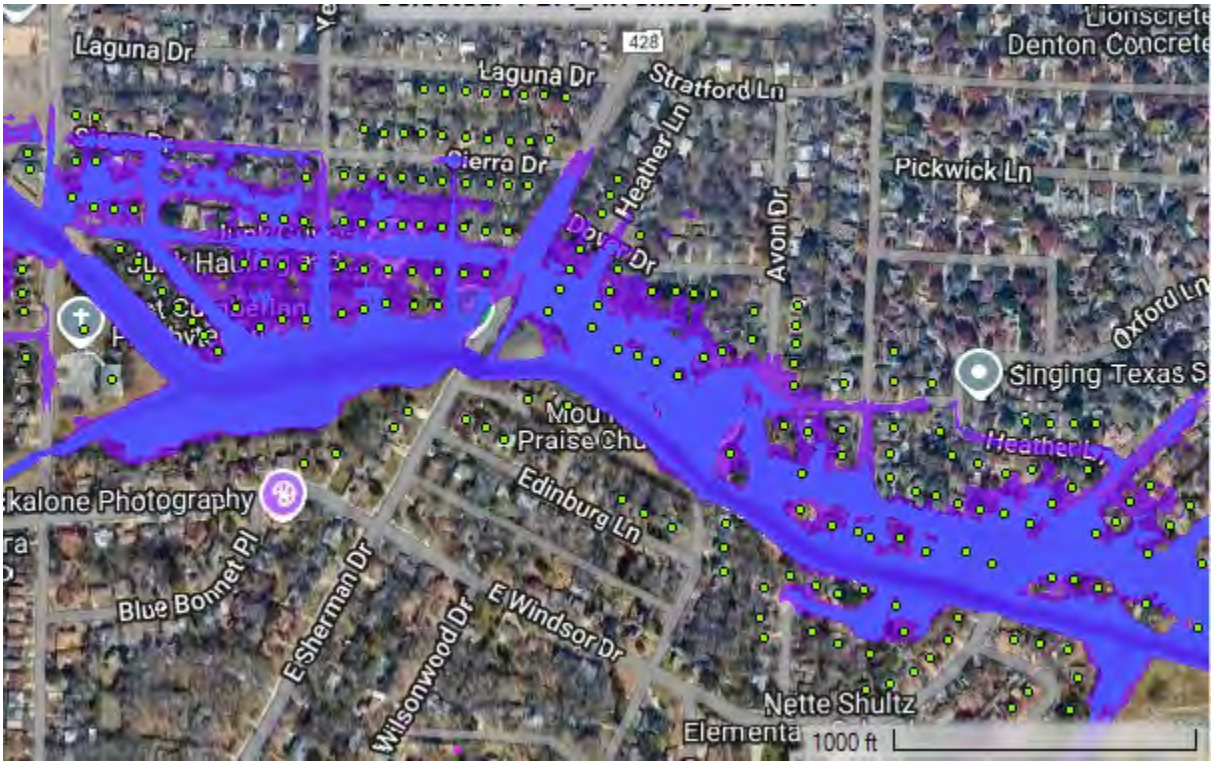


Figure 25 25-year event without-project (Purple) and alternative 2C1 (Blue) floodplain

Figure 26 100-year event without-project (Purple) and alternative 2C1 (Blue) floodplain

2D1 (Detention above Stuart Road, elevation 634 feet)

This alternative is similar to 2C1 but has additional excavation depth, lower earthen weir elevation, and longer drainage pipe. This alternative sought to utilize a large area of undeveloped land upstream of Stuart Rd. This area is not owned by the City of Denton and will result in more environmental impacts due to existing trees, however this area has a significant amount of volume that could be used for floodwater storage. Figure 27 shows the location of alternative 2D1.

Figure 27 Location of alternative 2D1

About 9 acres of land was excavated to elevation 634 feet and resulted in an average excavation depth of 10 feet (Total excavation volume is 151,000 cubic yards). The alternative would include an earthen weir approximately 850 feet in length cut to an elevation of 639.8 feet which would optimize the flood storage of the peak of flood hydrograph. The elevation could be increased or decreased to focus flood shaving for different events, but the 25-year event was the event that was selected as a compromise between frequent flood events like the 10-year event and more infrequent flood events like the 100-year. The alternative also includes a pipe at the downstream end to drain the detention area. This detention alternative meets study objectives but also provides environmental benefits through creation

of new fluvial floodplain area (Nature Based Solution) and native grass plantings. A sample section of this alternative is included in Figure 28.

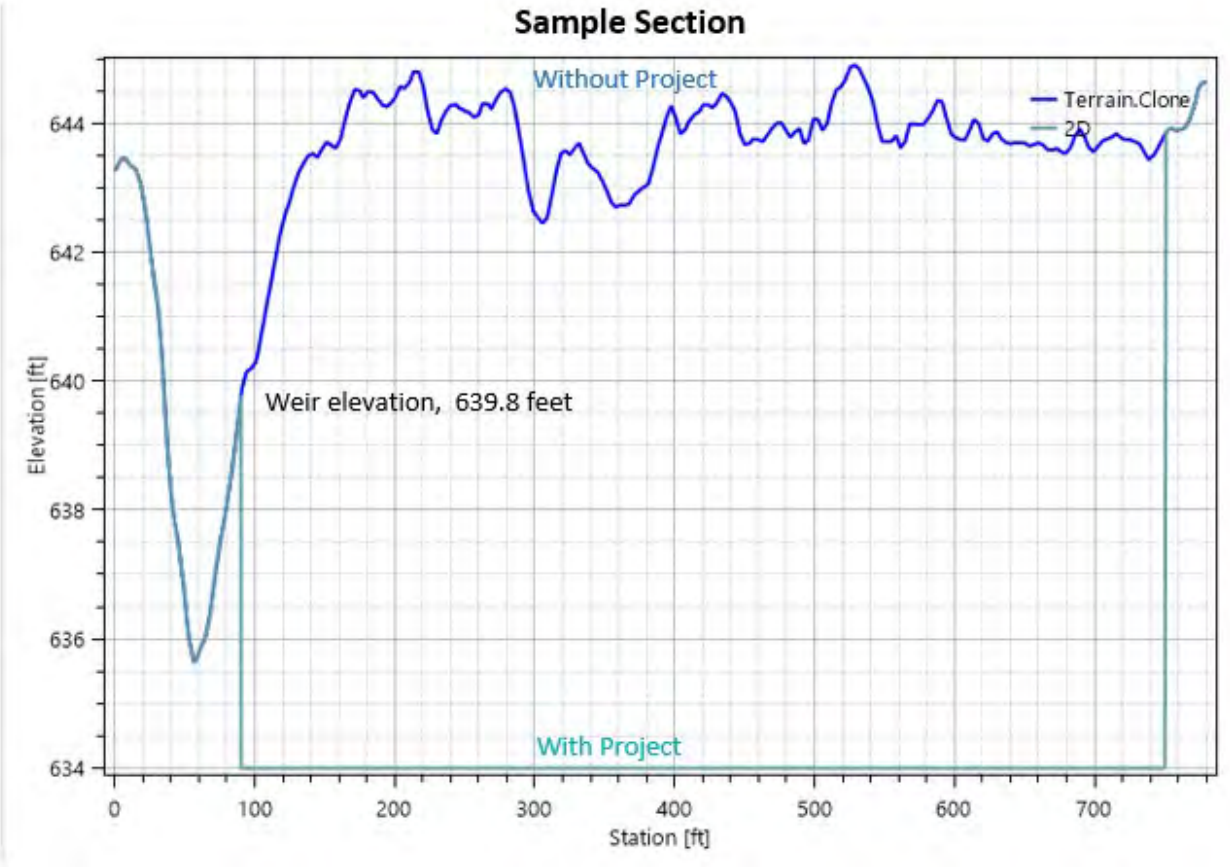


Figure 28 Sample section from alternative 2D1

2D1 resulted in a reduction of discharges due to the flood storage capacity. The reduction in flow resulted in a maximum water surface elevation reduction of about 1.7 feet (25-year event) with structures along a large portion of Cooper Creek benefitting from the alternative due to the reduced discharges. Figure 29 and Figure 30 shows how much the 25-year and 100-year water surface elevation was reduced by alternative 2D1. Figure 31 and Figure 32 compare the without-project floodplain and the alternative 2D1 floodplain for the 25-year and 100-year events.

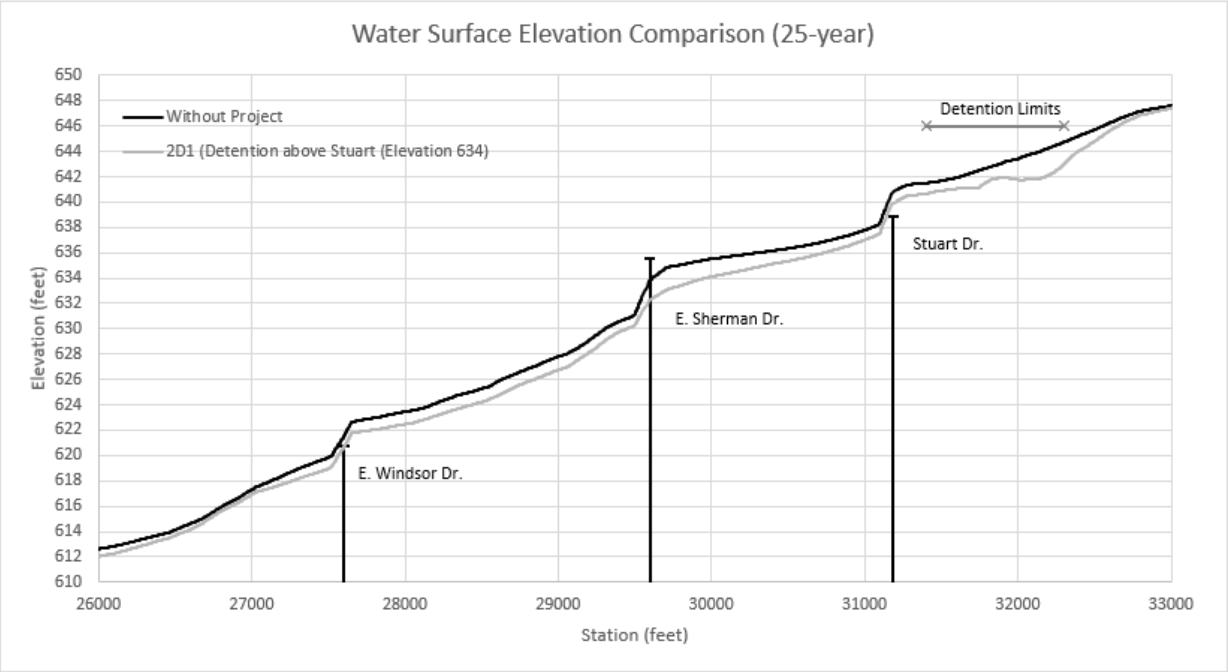


Figure 29 Water surface elevation reduction for alternative 2D1 (25-year event)

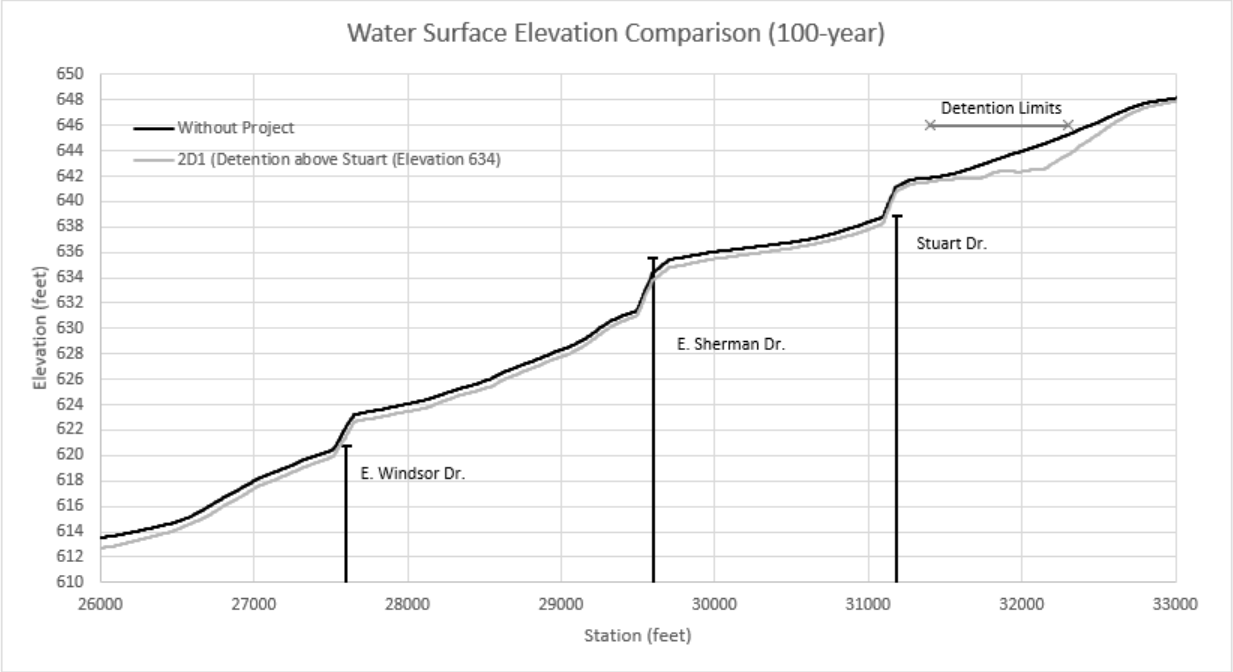


Figure 30 Water surface elevation reduction for alternative 2D1 (100-year event)

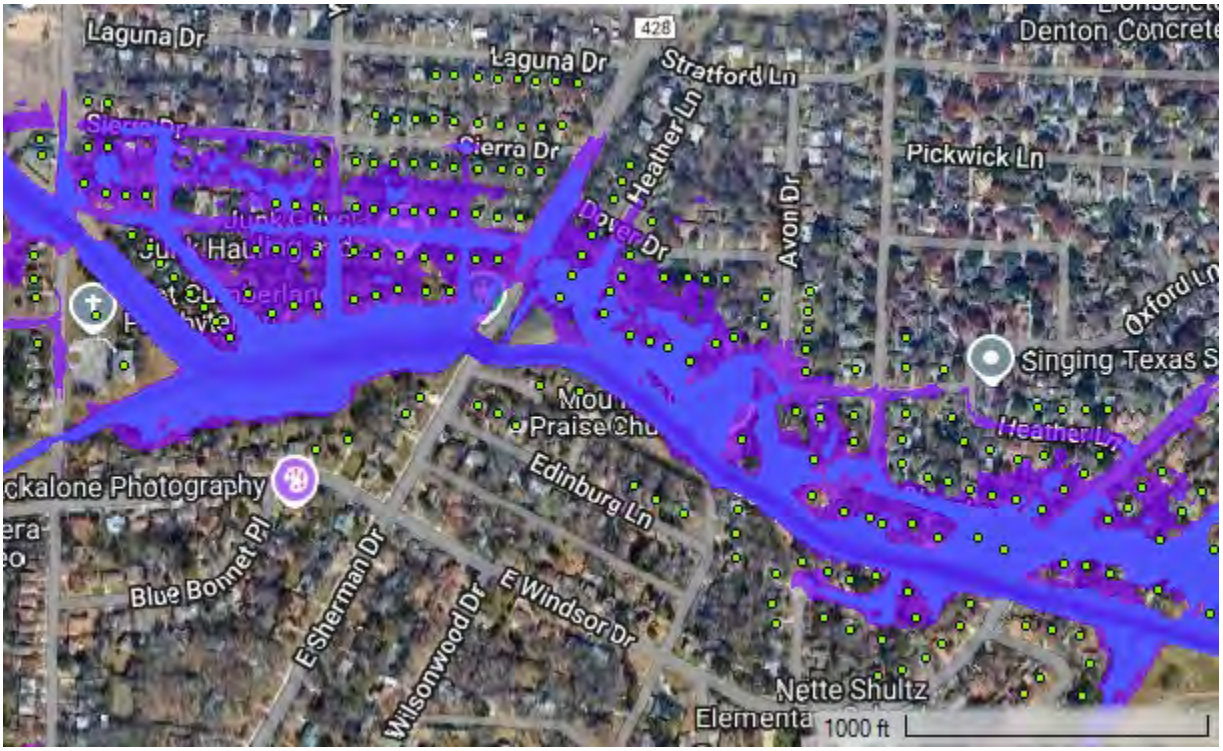


Figure 31 25-year event without-project (Purple) and alternative 2D1 (Blue) floodplain

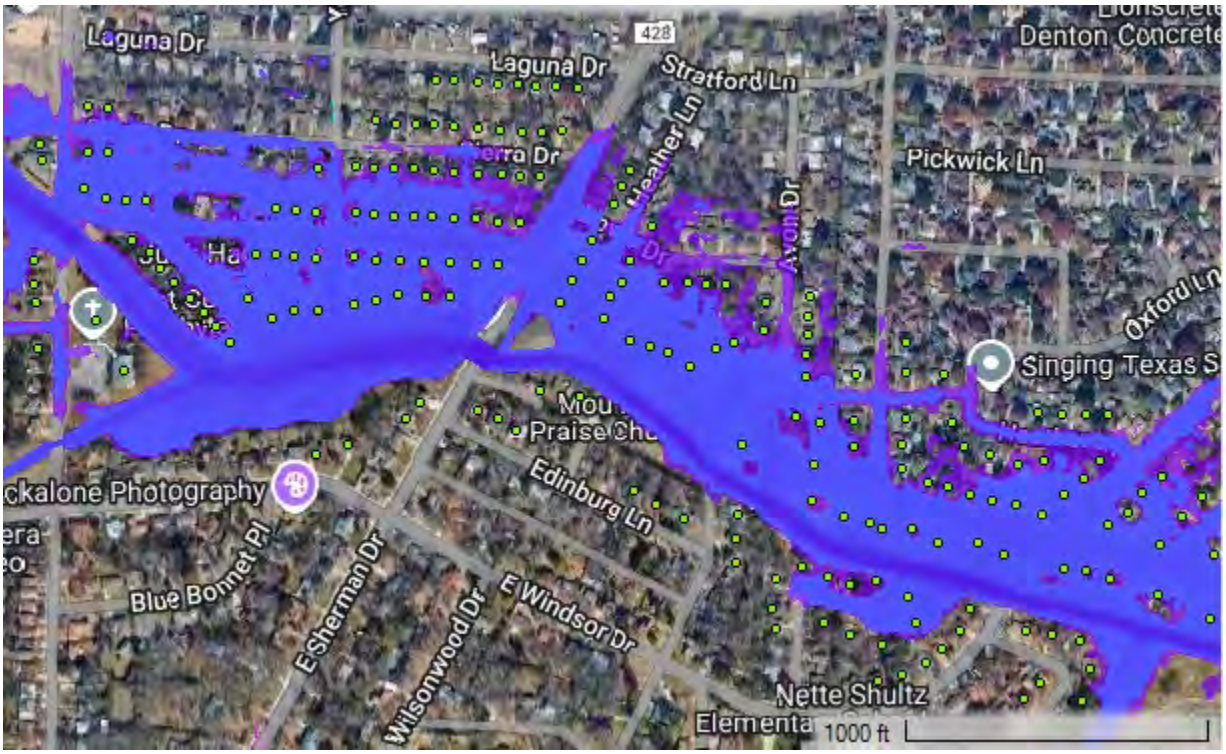


Figure 32 100-year event without-project (Purple) and alternative 2D1 (Blue) floodplain

3A1 (Detention (2C1) + channelization at Windsor Drive)

This alternative includes the detention from alternative 2C1 and channelization around Windsor Rd. The channelization extent for this alternative was identified as the "NED Plan" in a previous USACE report titled "Cooper Creek, Denton Texas, Stage 2 Planning Draft Detailed Project Report" which was from a 1981 USACE CAP Section 205 study on Cooper Creek. Figure 33 shows the location of alternative 3A1.

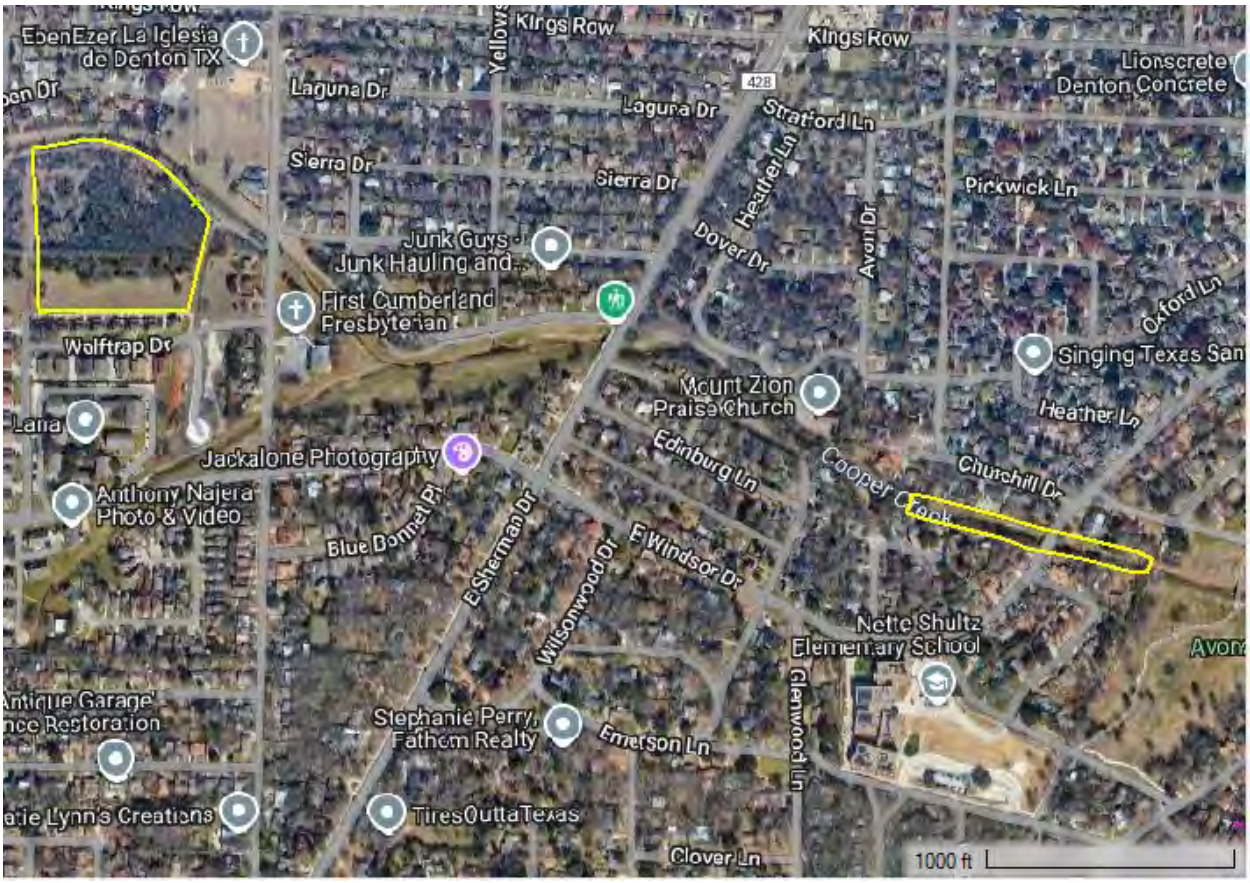


Figure 33 Location of alternative 3A1

In addition to the detention configuration describes under alternative 2C1, channelization was performed around Windsor Dr. The channelization included approximately 850 feet of grass lined channel improvement with a bottom width of 30 feet and side slopes of 3 horizontal to 1 vertical. The total excavation amount for this alternative is 110,400 cubic yards. This detention alternative meets study objectives but also provides environmental benefits through creation of new fluvial floodplain area (Nature Based Solution) and native grass plantings. A sample section of the channelization is included in Figure 34.

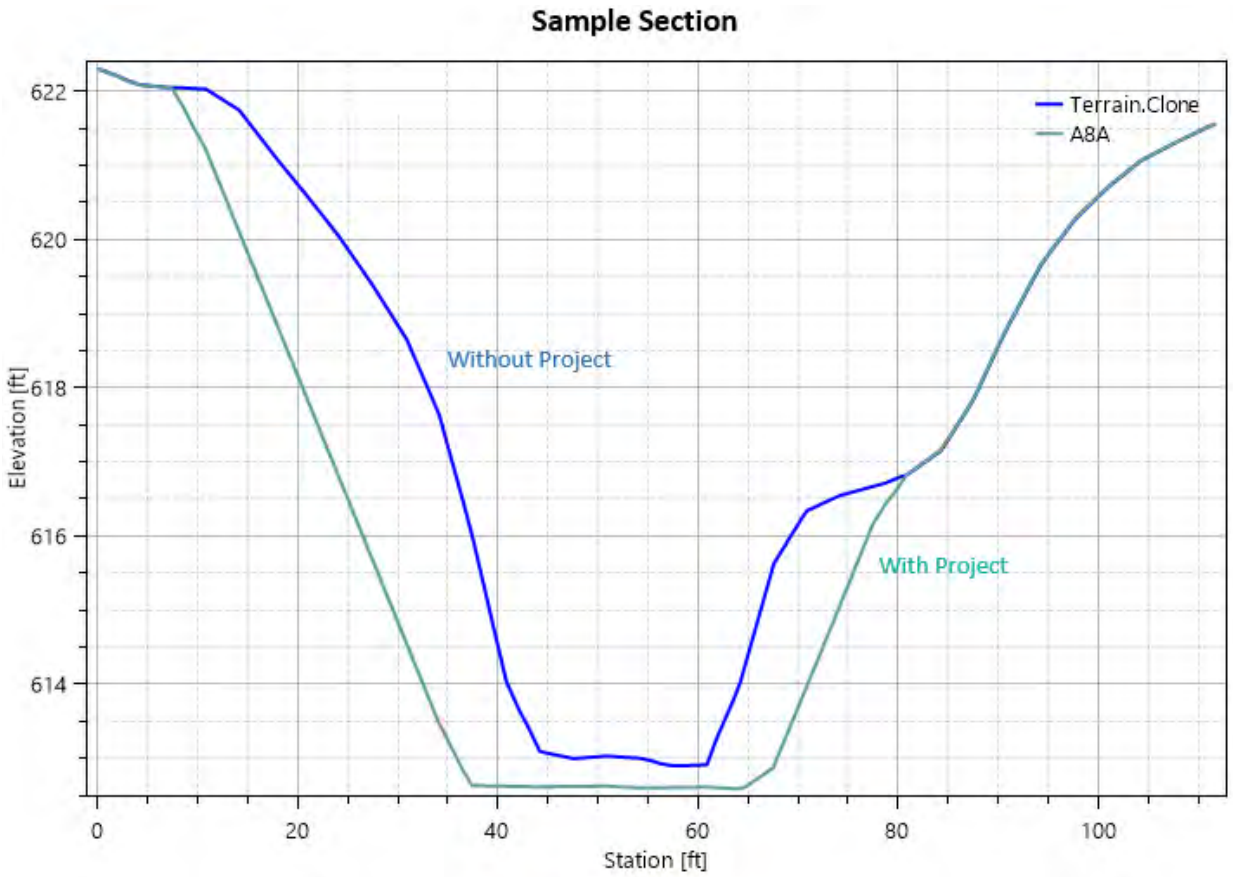


Figure 34 Sample section from alternative 3A1

3A1 resulted in a reduction of discharges due to the added flood storage capacity as well as a maximum reduction in water surface elevation of 1.3 feet (25-year event) with structures along a large portion of Cooper Creek benefitting from the alternative due to the reduced water surface elevations. Figure 35 and Figure 36 shows how much the 25-year and 100-year water surface elevation was reduced by alternative 3A1. Figure 37 and Figure 38 compare the without-project floodplain and the alternative 3A1 floodplain for the 25-year and 100-year events.

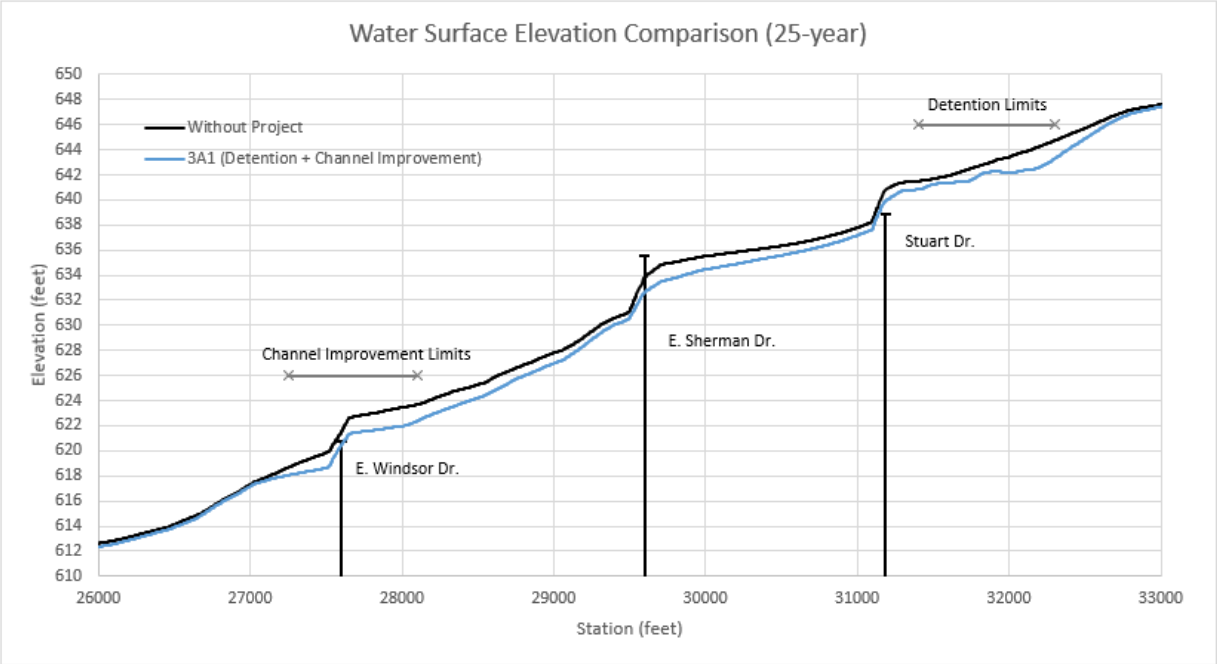


Figure 35 Water surface elevation reduction for alternative 3A1 (25-year event)

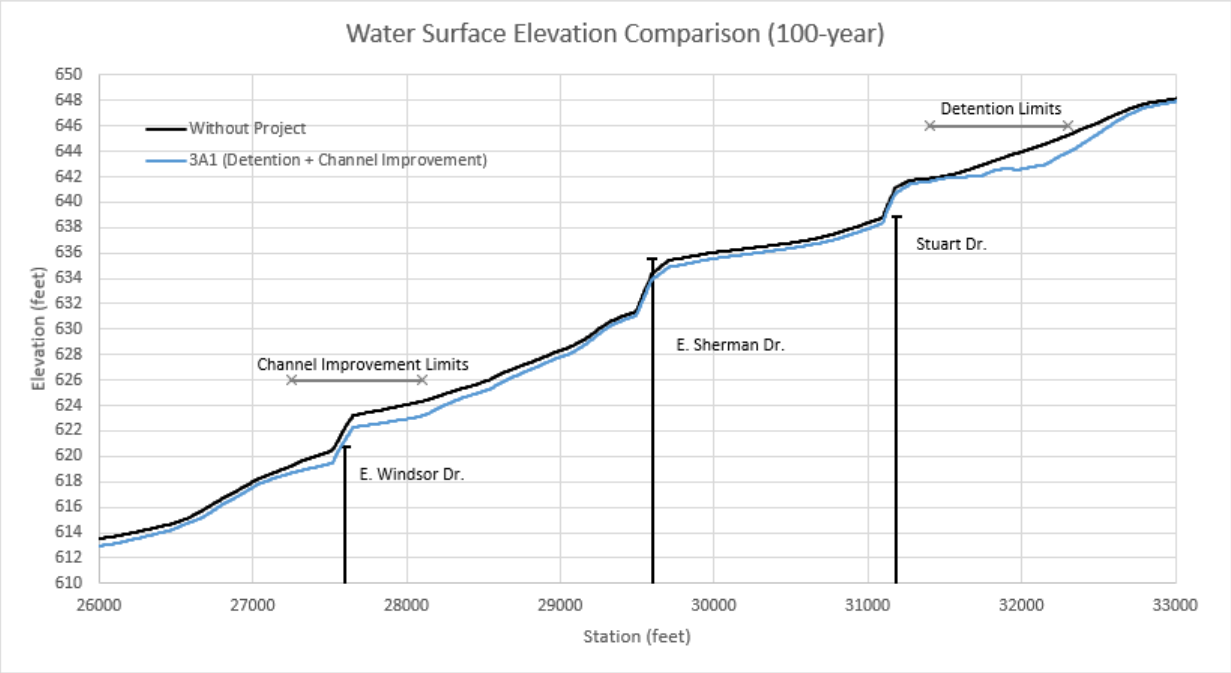


Figure 36 Water surface elevation reduction for alternative 3A1 (100-year event)

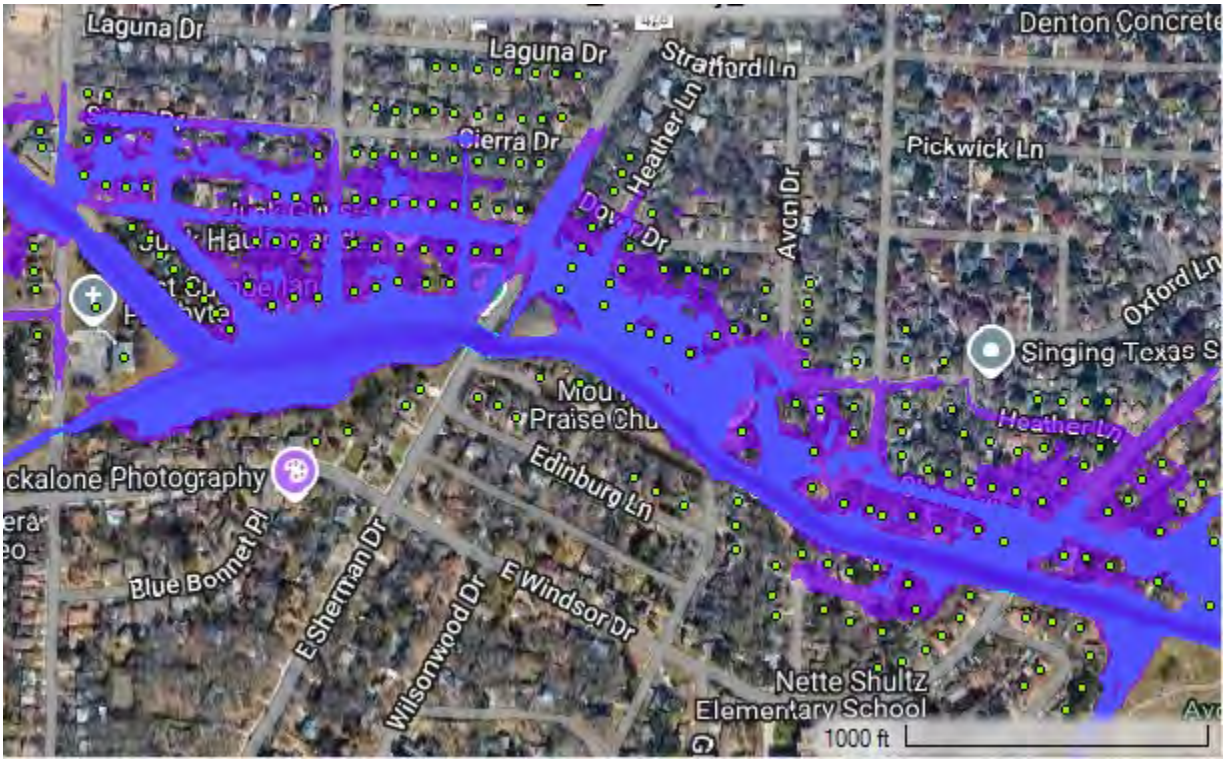


Figure 37 25-year event without-project (Purple) and alternative 3A1 (Blue) floodplain

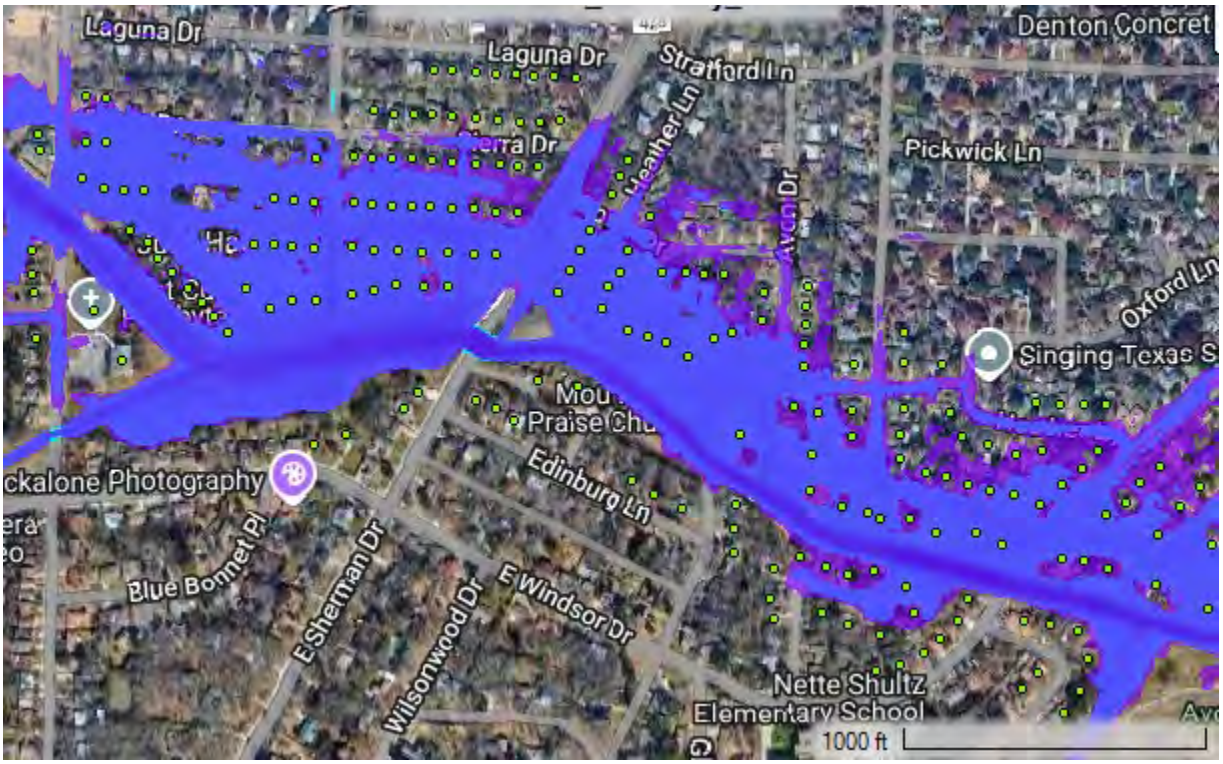


Figure 38 100-year event without-project (Purple) and alternative 3A1 (Blue) floodplain

5A1 (Detention (2C1) and bridge improvements at Sherman Drive)

The goal with this alternative was to reduce the water surface elevations through Cooper Creek by adding flood storage with detention (Configuration from alternative 2C1) and increasing the capacity through the Sherman Drive bridge. The capacity increase was based on a configuration analyzed and costed during a 2009 study performed for the City of Denton by an engineering firm. Figure 39 shows the location of alternative 5A1.

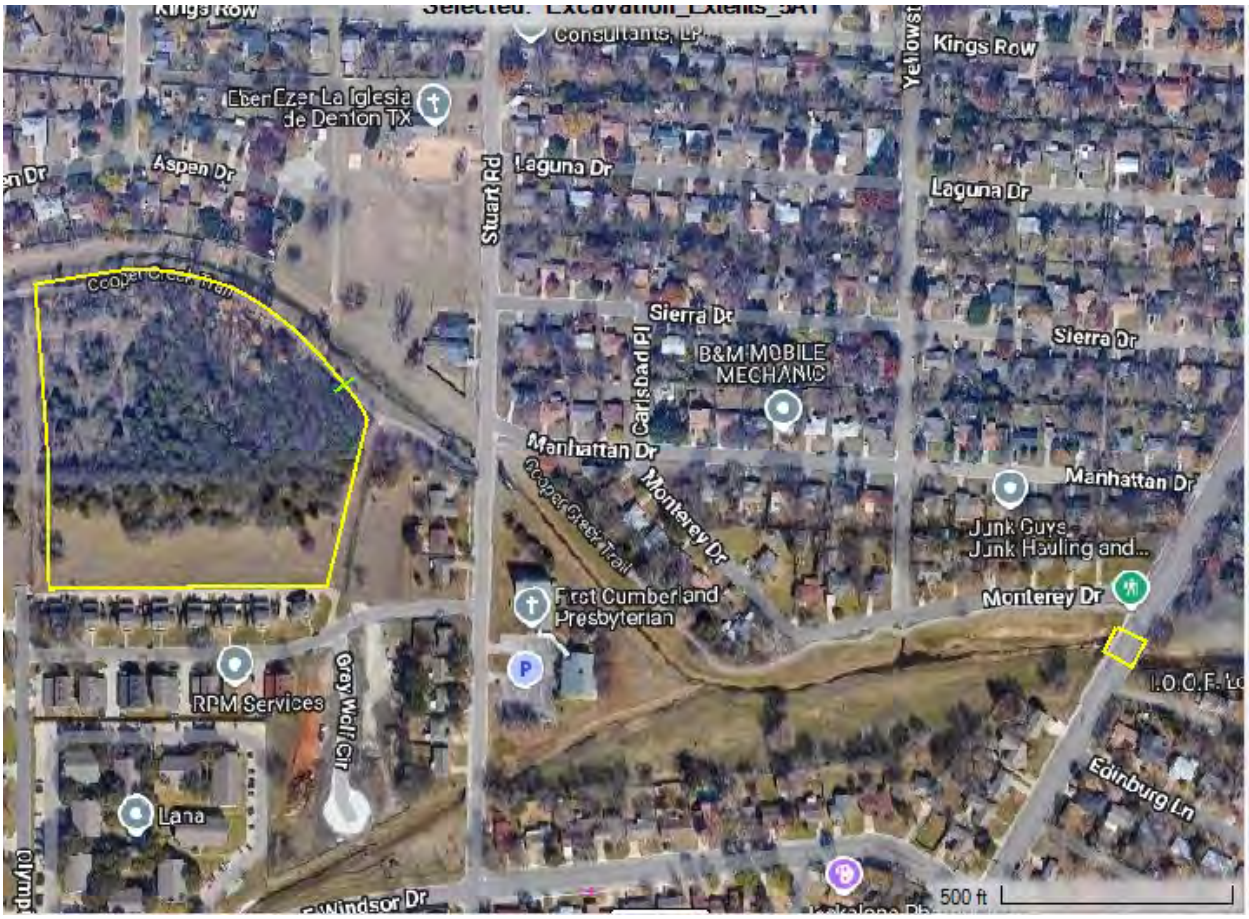


Figure 39 Location of alternative 5A1

In addition to the detention configuration described under alternative 2C1, the Sherman Drive crossing capacity was increased from a a single 30-foot clear span to 2 – 40 ft by 8 ft clear spans with a single 2 ft wide pier and vertical abutments This provided a significant increase in flow area through the bridge (From 210 square feet to 640 square feet). Figure 40 provides an illustration of how the existing crossing compares to the proposed crossing from 5A1. The cost estimate for the improvements to Sherman Drive from the 2009 study was $1M. Details associated with the cost estimate for this alternative are included in Figure 41.

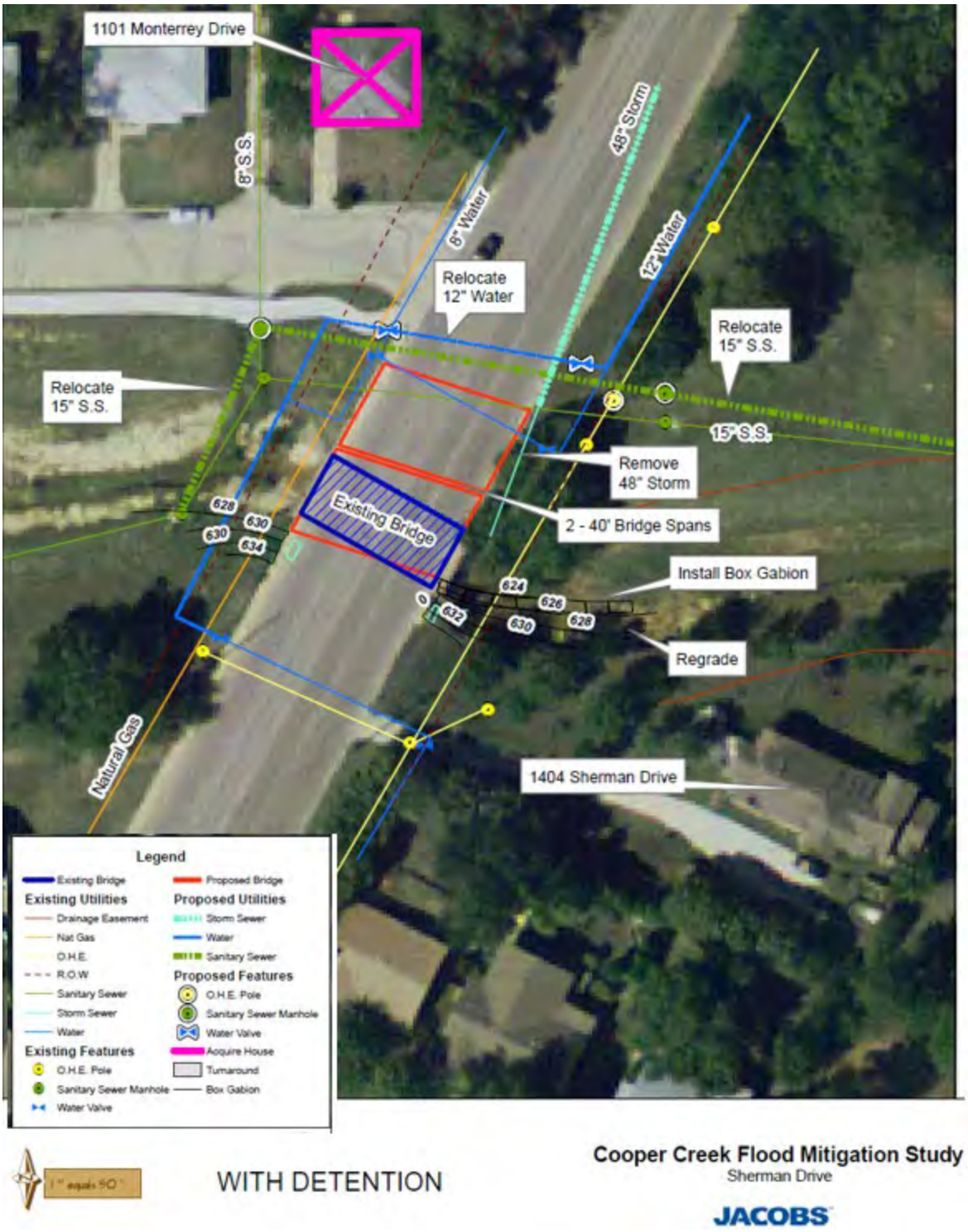


Figure 40 Layout of proposed bridge improvements for alternative 5A1

City of Denton
Cooper Creek Flood Mitigation
Preliminary Opinion of Probable Construction Cost

Sherman Dr (2 Spans) Scenarios 2&4

Item No.	Description	Quantity	Unit	Unit Cost	Cost
1	Mobilization (5%)	1	LS	$33,315.00	$33,315
2	15" Sanitary Sewer Pipe	550	LF	$120.00	$66,000
3	4'X4' Sanitary Sewer Manhole	3	EA	$3,000.00	$9,000
4	Remove Existing 8"&15" Sanitary Sewer	520	LF	$10.00	$5,200
5	Remove Existing Sanitary Sewer Manhole	2	EA	$1,000.00	$2,000
6	48" Class III RCP	110	LF	$180.00	$19,800
7	Remove 48" Storm Drain Pipe	60	LF	$15.00	$900
8	36" Class III RCP	150	LF	$150.00	$22,500
9	Headwall & Wingwall Structure	1	EA	$4,000.00	$4,000
10	12" Water Line	340	LF	$80.00	$27,200
11	12" Gate Valve	3	EA	$2,000.00	$6,000
12	Remove 8"&12" Water Line	450	LF	$5.00	$2,250
13	Asphalt Pavement Repair, Utilities	140	LF	$70.00	$9,800
14	Trench Safety	450	LF	$3.00	$1,350
15	Property Acquisition & Demolition	1	LS	$55,800.00	$55,800
16	Remove Existing Bridge	1	LS	$20,000.00	$20,000
17	2-40' Span Bridge	5,280	SF	$65.00	$343,200
18	Bridge Excavation	1,560	CY	$15.00	$23,400
19	12" Asphalt Pavement Repair, Bridge	590	SY	$70.00	$41,300
20	Channel Excavation	200	CY	$15.00	$3,000
21	Power Pole Relocation (By Others)	1	LS	$0.00	$0
22	Hydromulch (Channel Slope Stabilization)	400	SY	$9.00	$3,600
23	PVC Coated Box Gabion (3'x3')	150	CY	$180.00	$27,000
24	Traffic Control	1	LS	$20,000.00	$20,000
25	SWPPP	1	LS	$10,000.00	$10,000
				Subtotal - Construction	**$756,600**
				20% Contingency	$151,320
				Construction Total	**$907,900**
				10% Engineering / Survey	$90,790
				Total Project Cost	**$998,700**

Item 21 - Requires power pole relocation by others

Figure 41 Cost estimate for Sherman Drive bridge improvements from 2009 study for City of Denton

5A1 resulted in a reduction of discharges due to the added flood storage capacity as well as a maximum reduction in water surface elevation of 2.8 feet (25-year event) with structures along a large portion of Cooper Creek benefitting from the alternative due to the reduced water surface elevations. Figure 42 and Figure 43 shows how much the 25-year and 100-year water surface elevation was reduced by alternative 5A1. Figure 44 and Figure 45 compare the without-project floodplain and the alternative 5A1 floodplain for the 25-year and 100-year events.

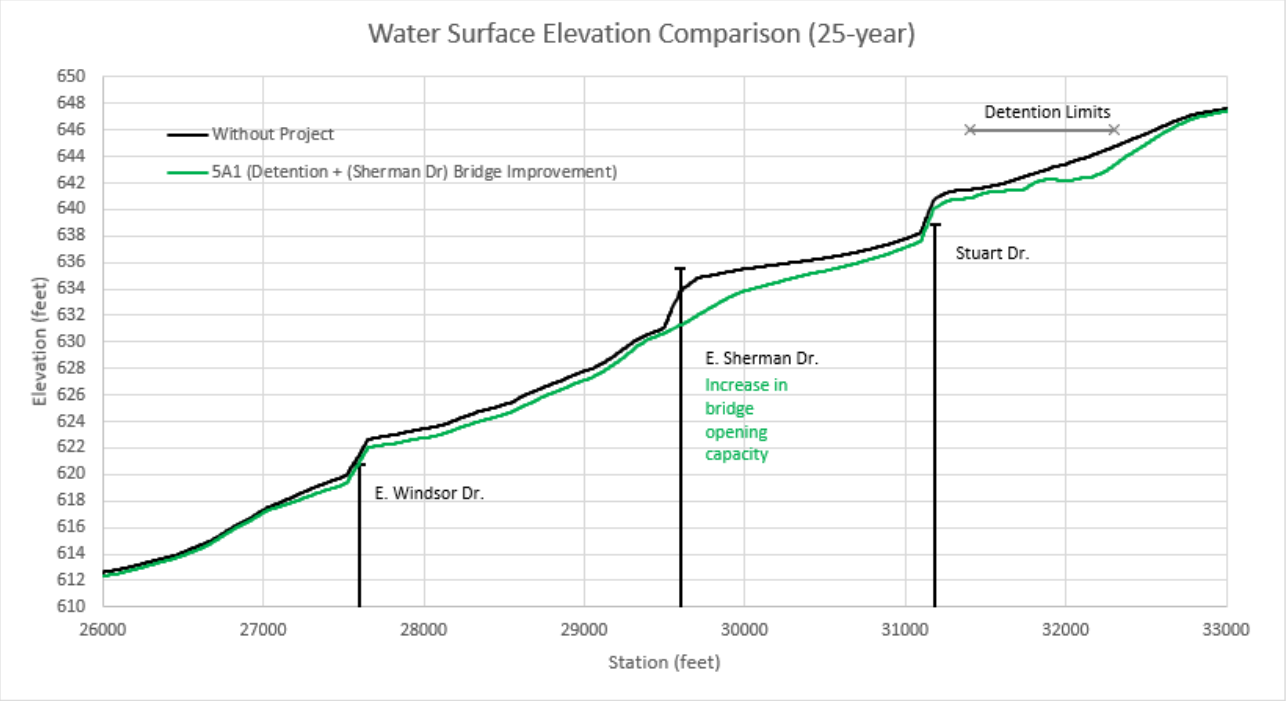


Figure 42 Water surface elevation reduction for alternative 5A1 (25-year event)

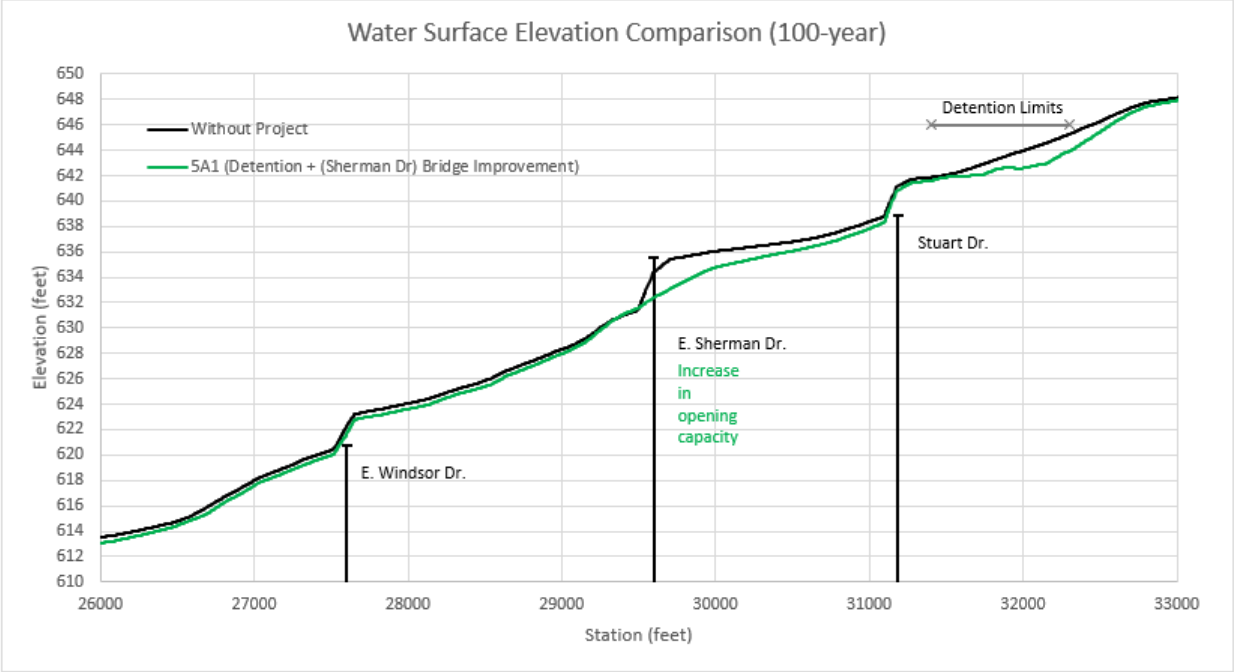


Figure 43 Water surface elevation reduction for alternative 5A1 (100-year event)

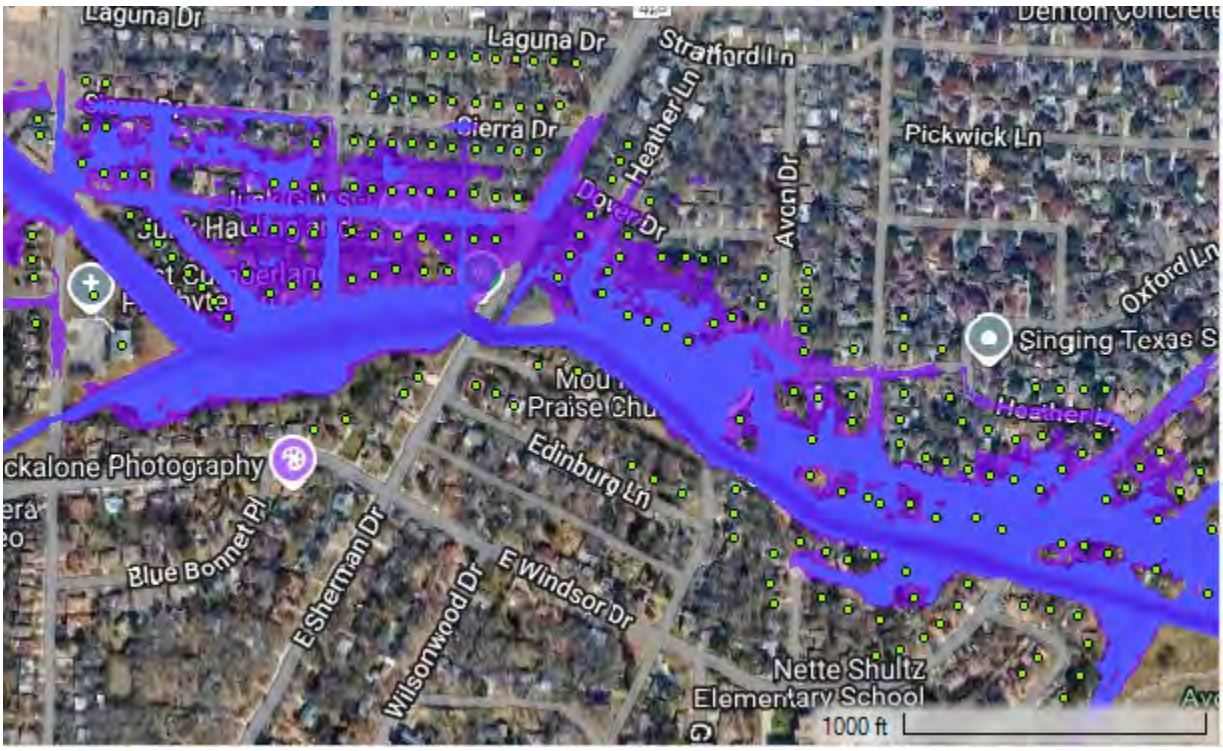


Figure 44 25-year event without-project (Purple) and alternative 5A1 (Blue) floodplain

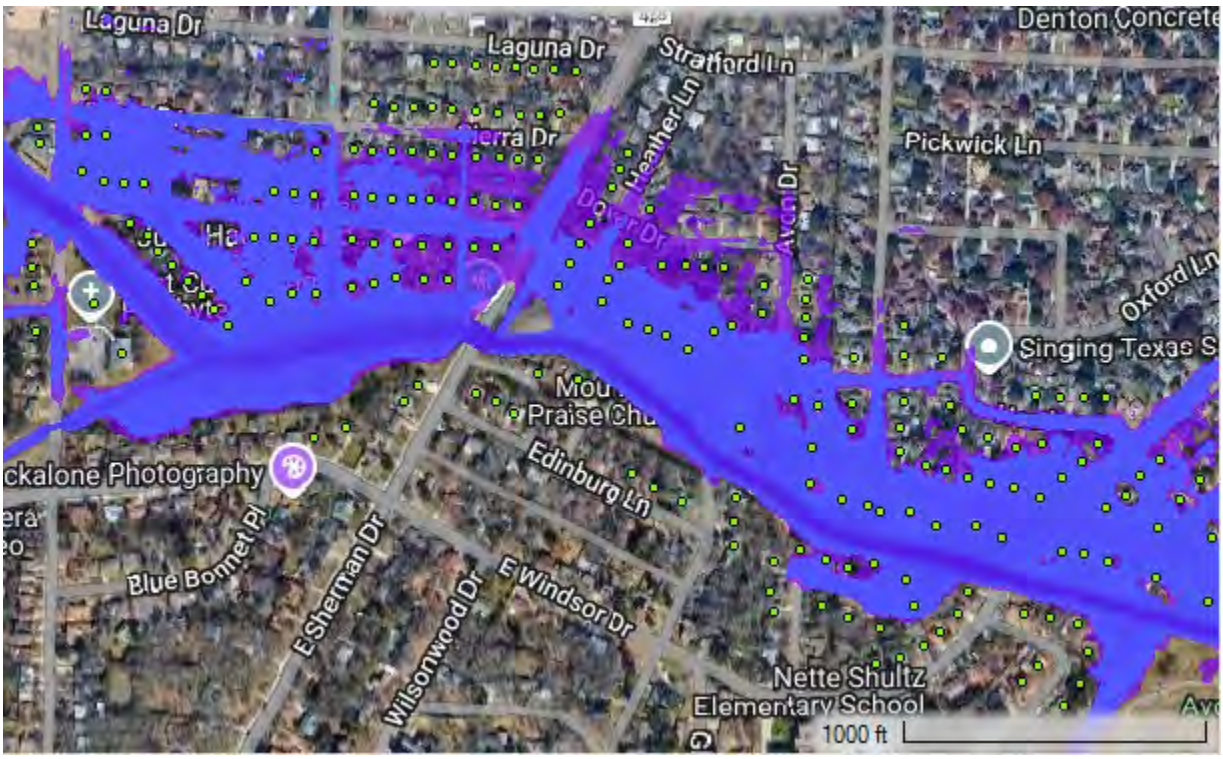


Figure 45 100-year event without-project (Purple) and alternative 5A1 (Blue) floodplain

8A1 (Channelization and bridge improvement at Windsor Drive)

The goal of this alternative was to reduce the water surface elevations through Cooper Creek by increasing the Cooper Creek channel capacity and crossing capacity at Windsor Dr. The channelization extent for this alternative was identified as the "NED Plan" in a previous USACE report titled "Cooper Creek, Denton Texas, Stage 2 Planning Draft Detailed Project Report" which was from a 1981 USACE CAP Section 205 study on Cooper Creek. Figure 46 shows the location of alternative 8A1.

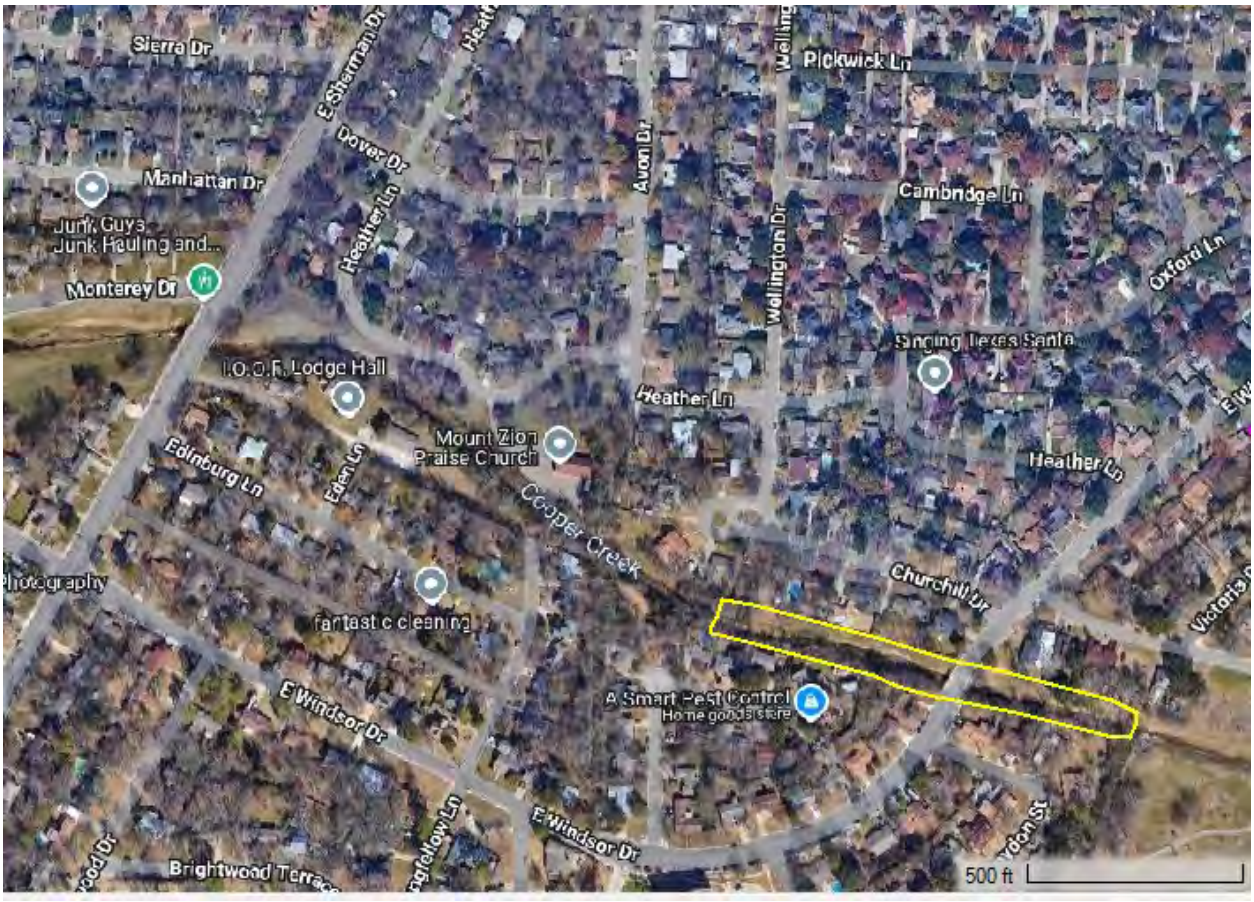


Figure 46 Location of alternative 8A1

Channelization was performed around Windsor Dr. The channelization included approximately 850 feet of grass lined channel improvement with a bottom width of 30 feet and side slopes of 3 horizontal to 1 vertical. The crossing capacity was increased from 4- 8 ft x 8 ft culverts to 4 – 8 ft x 8 ft culverts and 2 – 8 ft wide by 6 ft high culverts. It is assumed that that the 4 existing culverts will need to be demolished and replaced with 6 new culverts. The total excavation amount for this alternative is 4,400 cubic yards. To minimize impacts to the environment, this alternative will use native grass plantings. A sample section of the channelization is included in Figure 47. A figure showing the without-project and with-project culvert configuration is included in Figure 48.

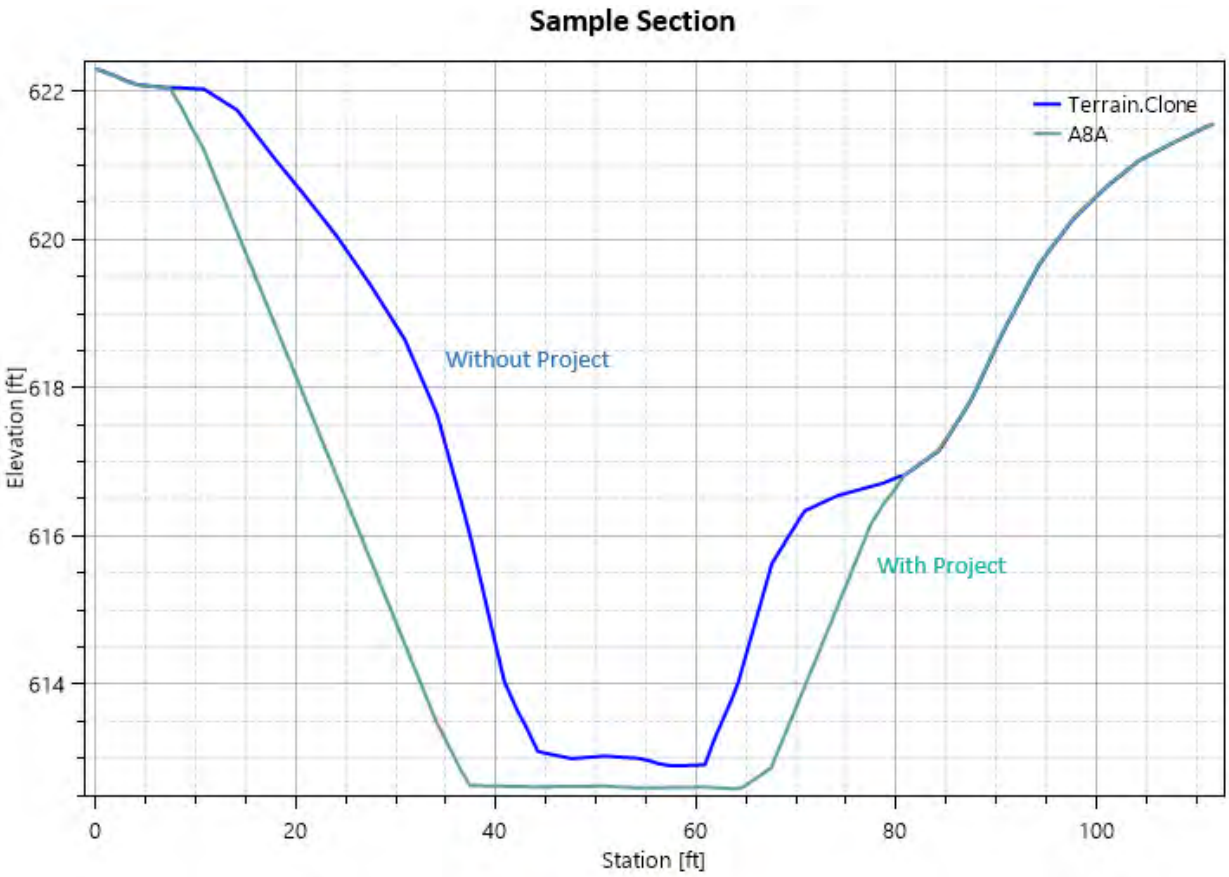


Figure 47 Sample section for alternative 5A1

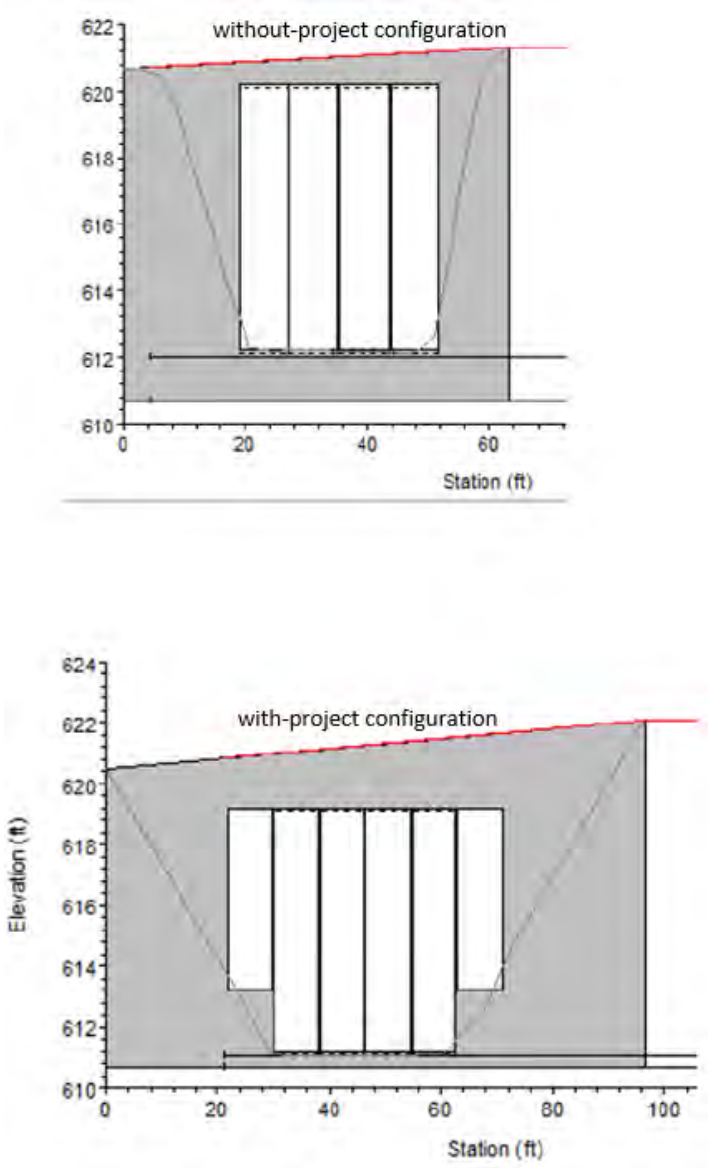


Figure 48 Culvert configuration (without-project vs with-project (8A1)

Alternative 8A1 resulted in a maximum water surface elevation reduction of 1.2 feet (25-year event) between Windsor Drive and Sherman Drive but did not provide any benefits upstream of Sherman Drive

An important note about this alternative is that it did result in some increase in flood risk downstream of the improvements. The water surface elevation increases as high as 0.4 feet (25-year event) were identified and would need to be addressed. One possible solution is to combine this alternative with upstream detention. Figure 49 and Figure 50 shows how much the 25-year water surface elevation was reduced by alternative 8A1. Figure 51 and Figure 52 compare the without-project floodplain and the alternative 8A1 floodplain for the 25-year and 100-year events.

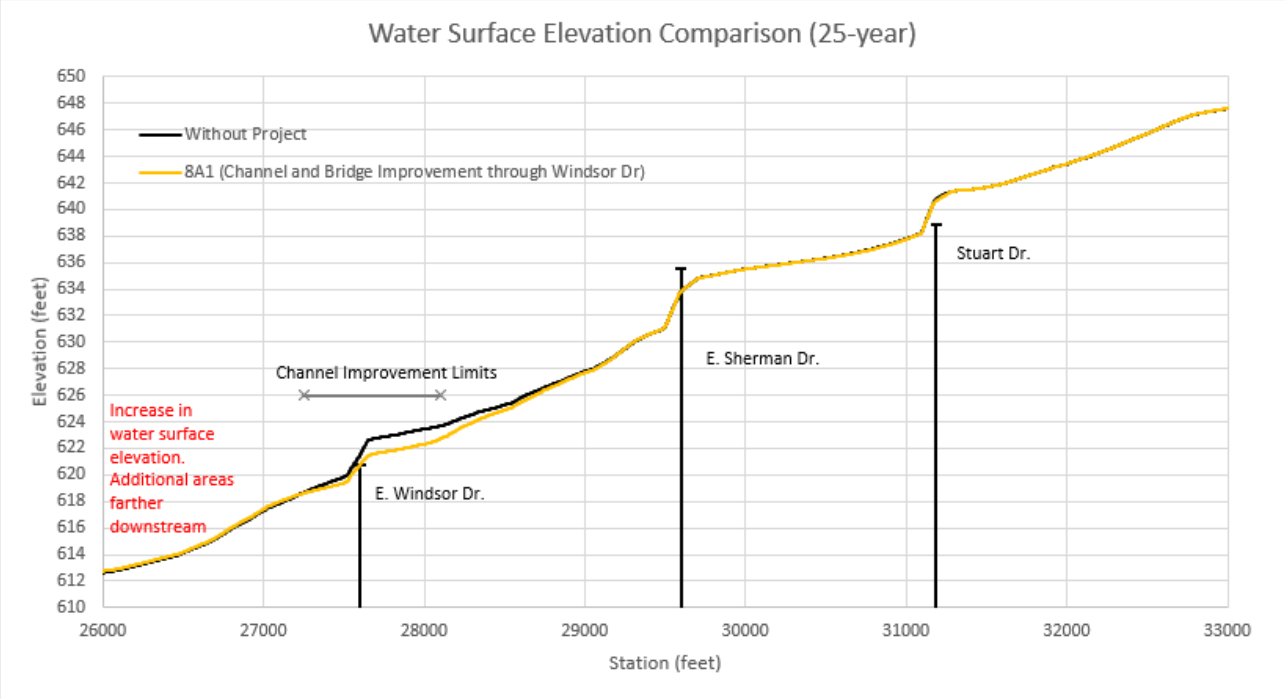


Figure 49 Water surface elevation reduction for alternative 8A1 (25-year event)

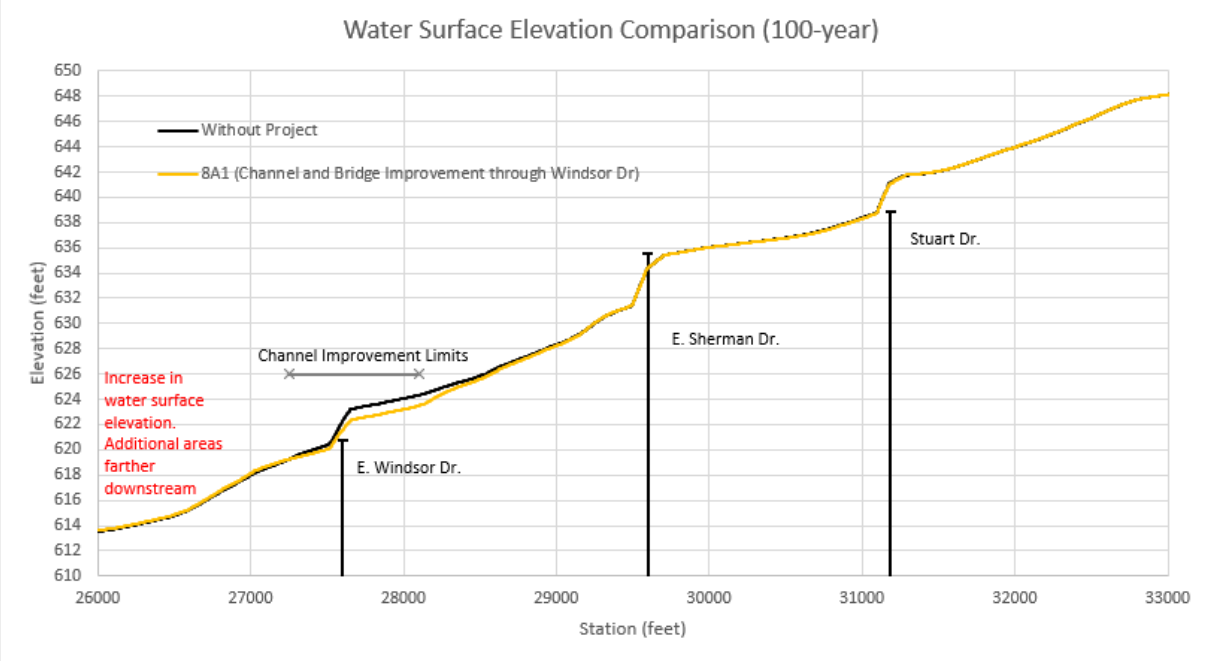


Figure 50 Water surface elevation reduction for alternative 8A1 (100-year event)

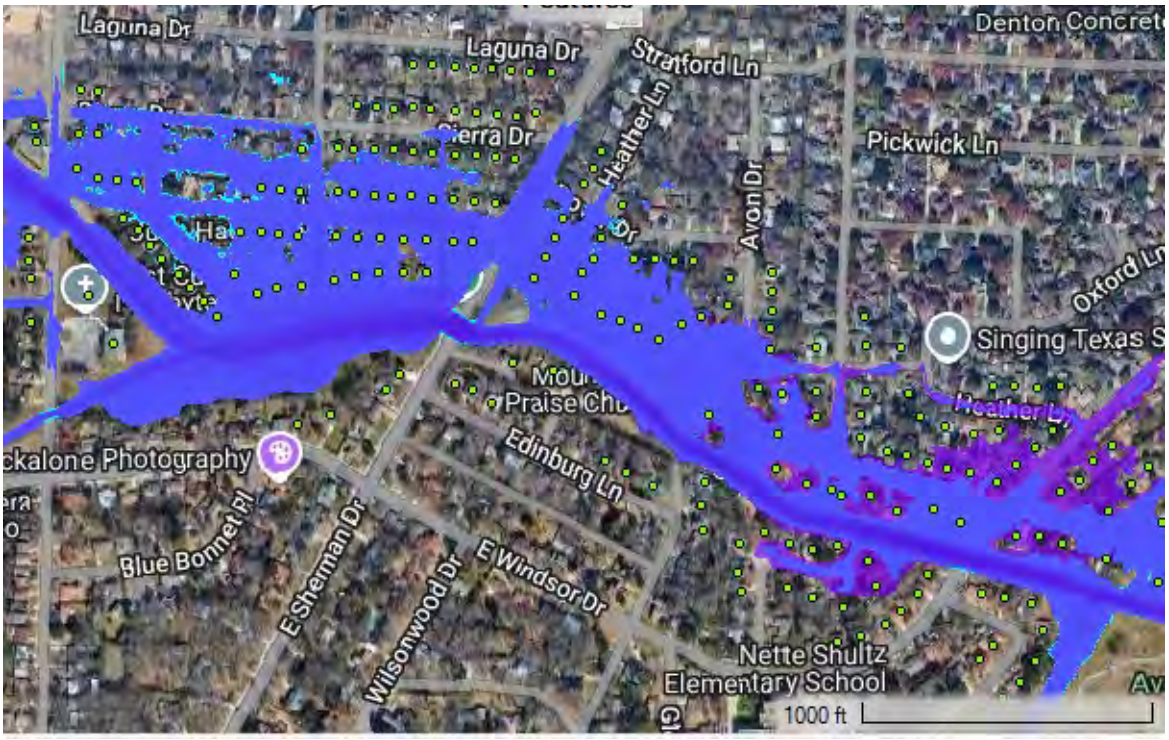


Figure 51 25-year event without-project (Purple) and alternative 8A1 (Blue) floodplain

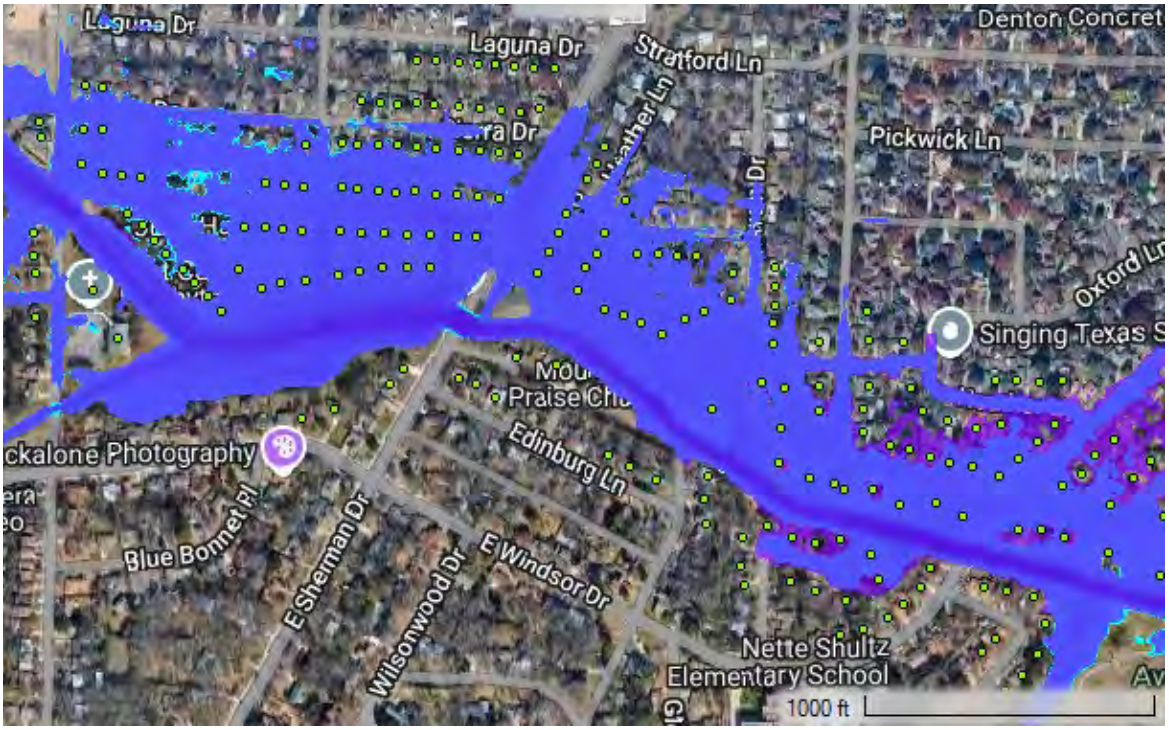


Figure 52 100-year event without-project (Purple) and alternative 8A1 floodplain

17A1 (Detention (2C1)+bridge improvements(8A1)+channelization(8A1))

The goal with this alternative was to reduce the water surface elevations through Cooper Creek by adding flood storage with detention (Configuration from alternative 2C1) and increasing channel and crossing capacity along Cooper Creek and through Windsor Dr (8A1). Figure 53 shows the location of alternative 17A1.

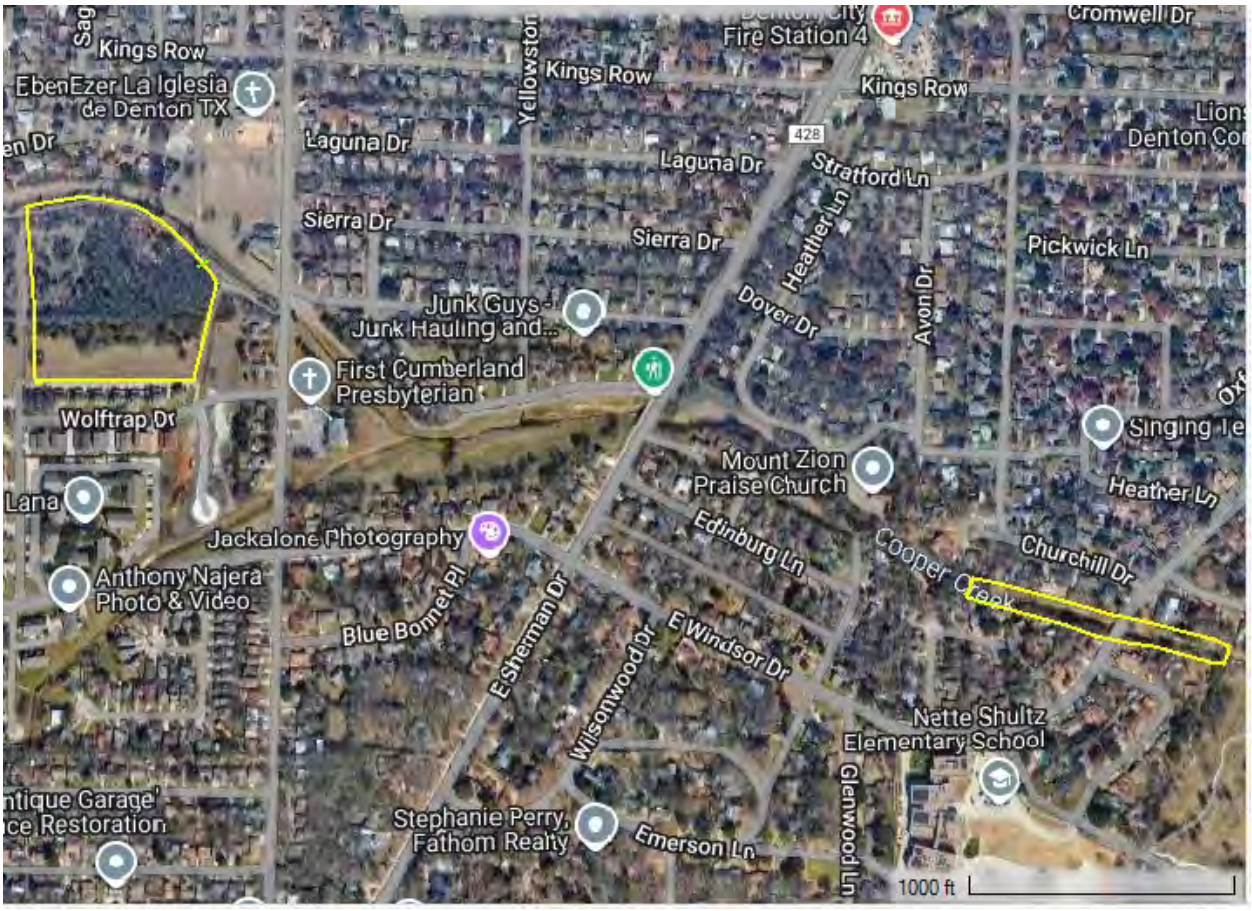


Figure 53 Location of alternative 17A1

In addition to the detention configuration described under alternative 2C1, channelization was also performed around Windsor Dr. The channelization included approximately 850 feet of grass lined channel improvement with a bottom width of 30 feet and side slopes of 3 horizontal to 1 vertical. The crossing capacity was increased from 4- 8 ft x 8 ft culverts to 4 – 8 ft x 8 ft culverts and 2 – 8 ft wide by 6 ft high culverts. The total excavation amount for this alternative is 110,400 cubic yards. A sample section of the channelization is included in Figure 54.

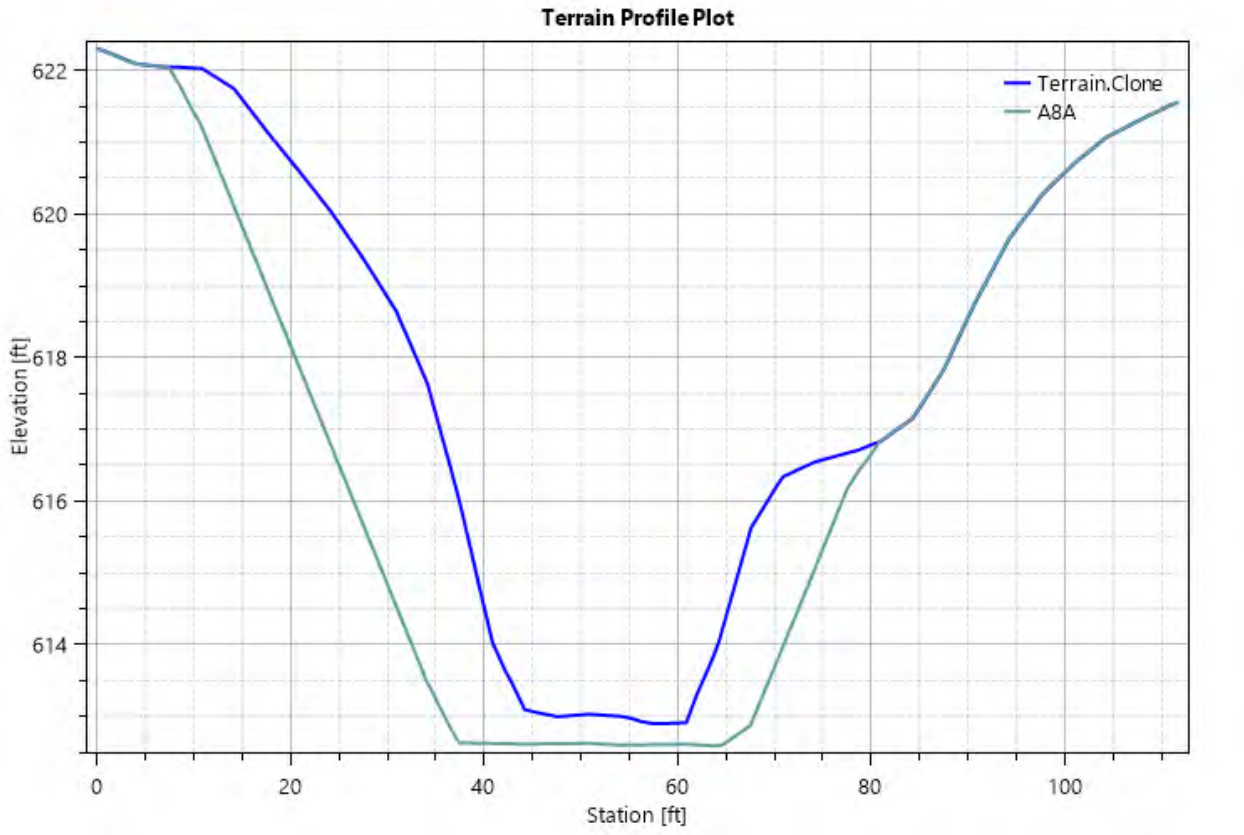


Figure 54 Sample section from alternative 17A1

Alternative 17A1 resulted in a maximum water surface elevation reduction of 2.4 feet (25-year event) with structures along a large portion of Cooper Creek benefitting from the alternative due to the reduced water surface elevations. Figure 55 and Figure 56 shows how much the water surface elevations reduced by alternative 17A1. Figure 57 and Figure 58 compare the without-project floodplain and the alternative 17A1 floodplain for the 25-year and 100-year events.

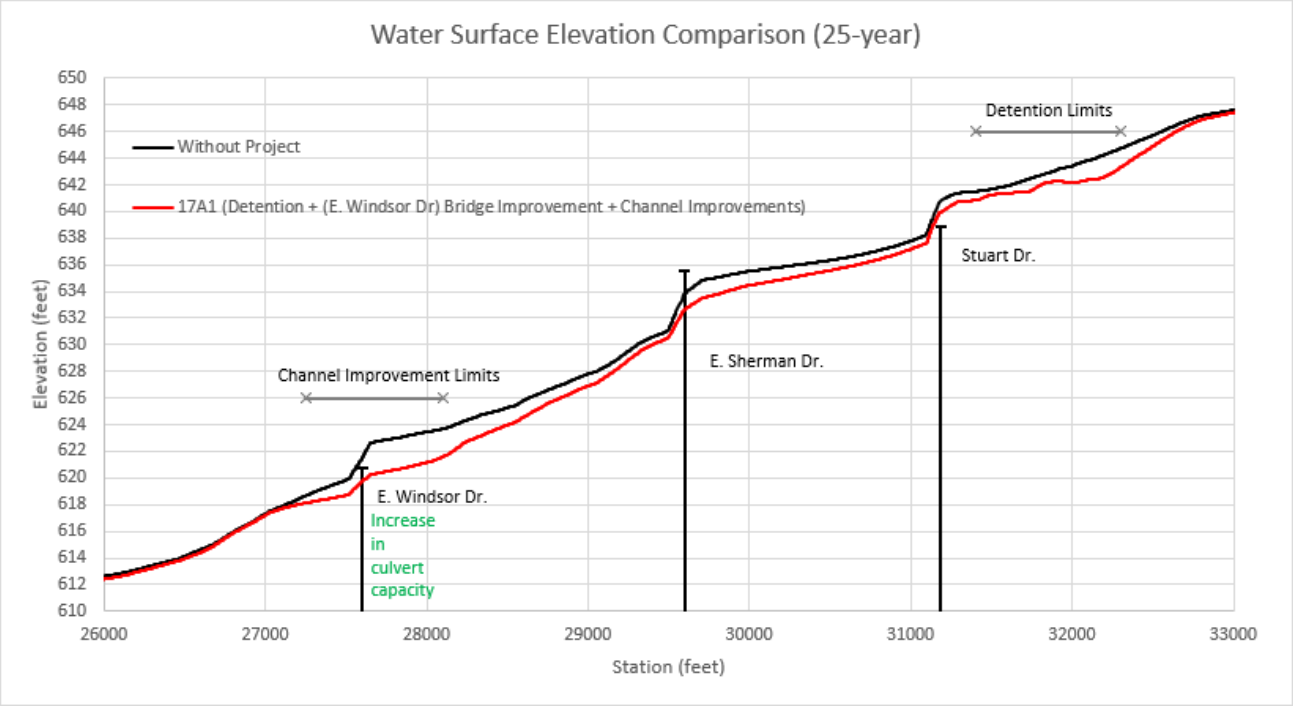


Figure 55 Water surface elevation reductions for alternative 17A1 (25-year event)

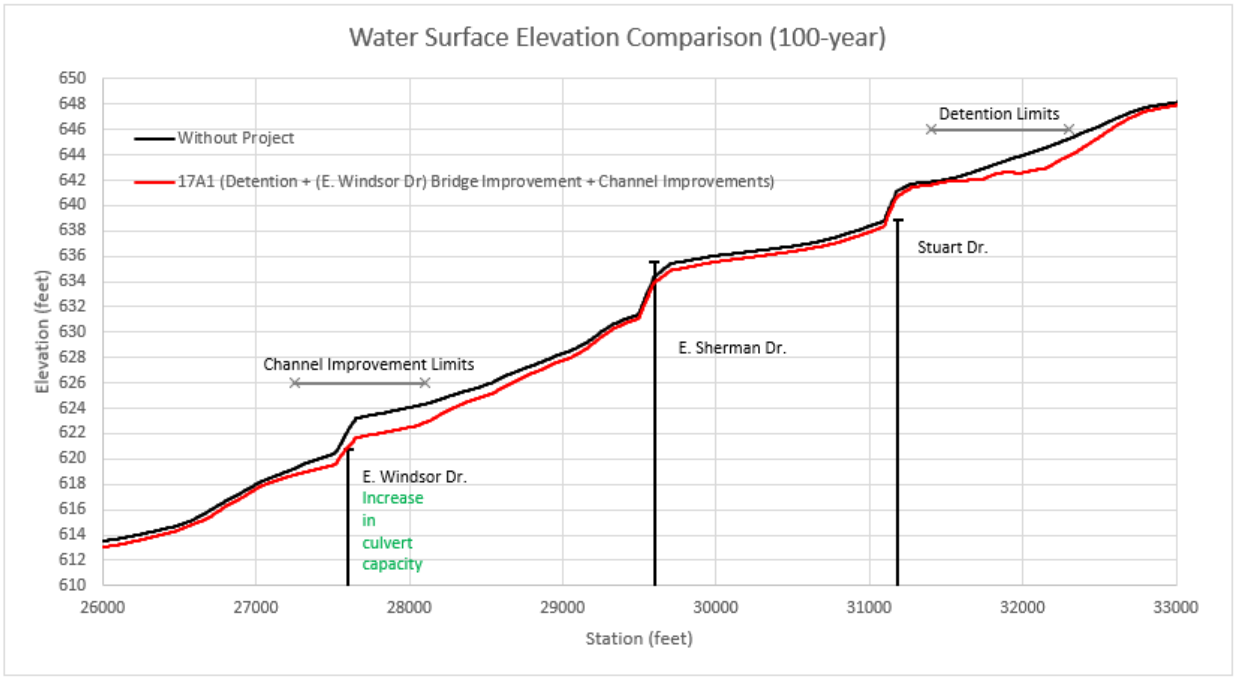


Figure 56 Water surface elevation reductions for alternative 17A1 (100-year event)

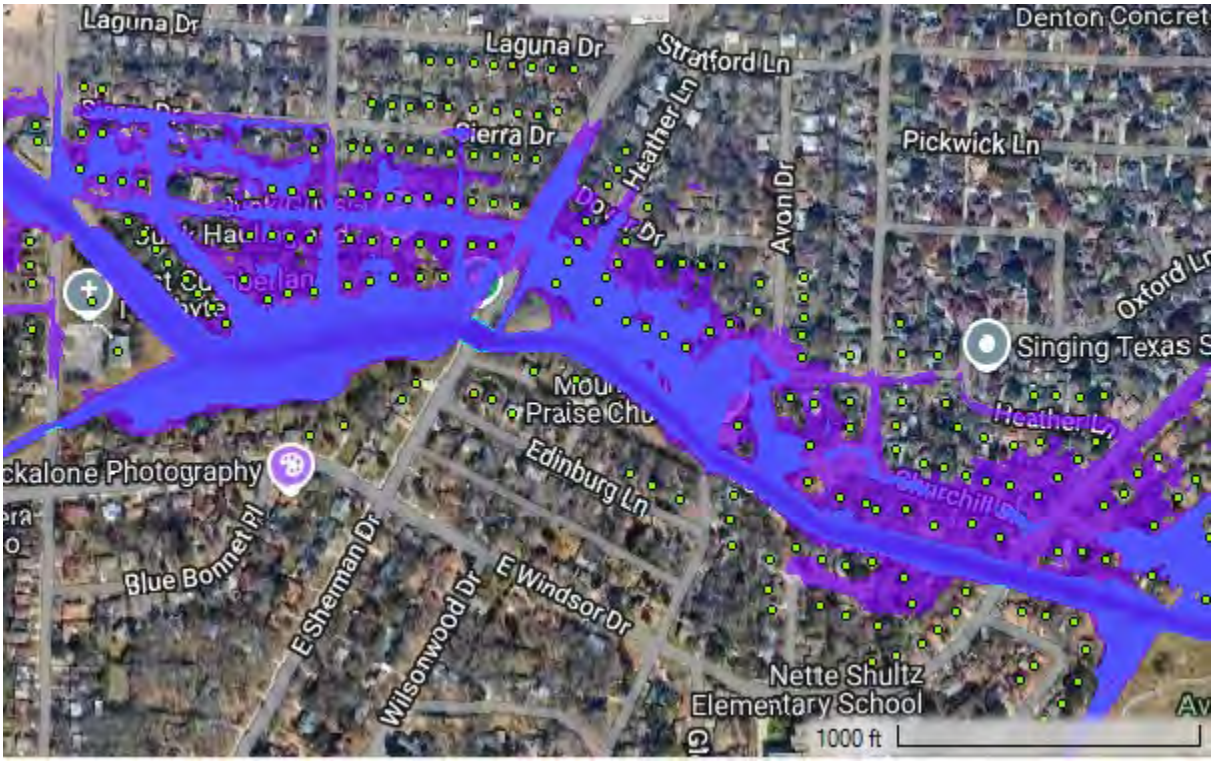


Figure 57 25-year event without-project (Purple) and alternative 17A1 (Blue) floodplain

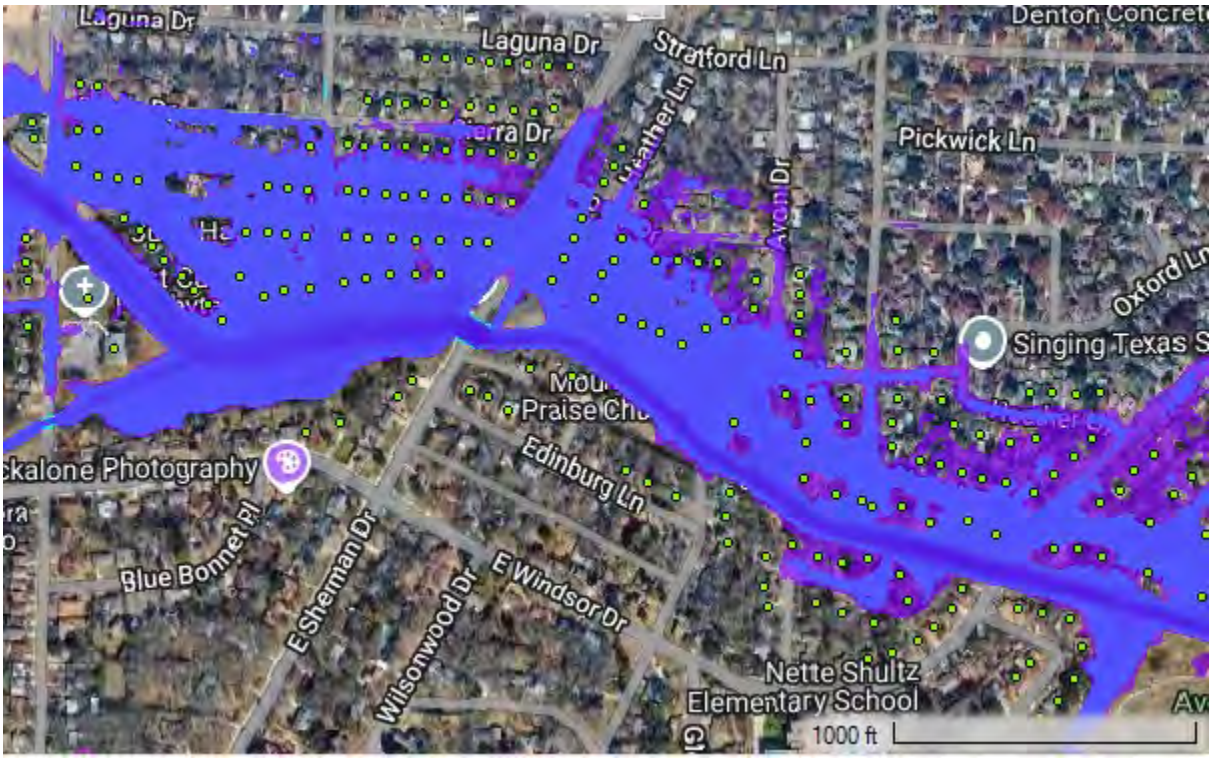


Figure 58 100-year event without-project (Purple) and alternative 17A1 (Blue) floodplain

5.0 CONCLUSIONS

Hydraulic analyses was performed to provide information that will help assess flood risk as well as inform flood risk management decision making within the Cooper Creek watershed.

The resulting hydraulic data was then used to determine the expected (average) annual flood damages. This existing conditions model was then used to analyze structural and non-structural flood damage reduction alternatives along Cooper Creek throughout the City of Denton.

After existing conditions were developed, Cooper Creek was analyzed to determine what physical changes could be made that would be most effective in reducing flood risk. Open space was considered for detention while existing floodplain was considered for channel and crossing improvement. Costs were then calculated and Hydrologic Engineering Center Flood Damage Analysis (HEC-FDA) was utilized to obtain the EADs. A ratio of benefits over costs (B/C ratio) and net benefits were then calculated. While flood risk could be reduced with the alternatives identified and analyzed, the economic analysis resulted in the determination that all of the structural alternative would produce a B/C ratio less than one. Cost and benefit details are in the economic appendix of the study report.

Model Limitations and Needs for Future Study

- **Equation Set Testing** – The Diffusion Wave equation set was selected for simulations in the analysis. This equation was selected for efficient run times and model stability. There are 3 shallow water equations (SWE) available that account for more information than the Diffusion Wave equations. The SWE will generally require a smaller computation interval than the Diffusion Wave method to run in a stable manner. If there are significant differences between the two runs, the user should assume the SWE answer is more accurate. The following is a list of examples where the SWE should generally be used.
    - Highly Dynamic Flood Waves
    - Abrupt Contractions and Expansions
    - Flat (less than 1 ft/mi) Sloping River Systems
    - Tidally Influenced Conditions
    - General Wave Propagation Modeling
    - Super Elevation around Bends
    - Detailed Velocities and Water Surface Elevations at Structures
    - Mixed Flow Regime
- **Model Detail Below Mingo Rd** – While the results at and downstream of Mingo Rd. do not impact the results of the study area, future studies at and downstream of Mingo Rd. may warrant additional analysis to verify the results in the primary areas of interest. Hydraulic structures were

not incorporated downstream of Mingo Rd. which could have an impact on flow hydrograph routing and computations.

- **Detention Refinement** – The detention alternatives were developed to optimize flood risk reduction to the 25-year flood water surface elevations. Weir elevation was the primary parameter that was optimized. Sherman Drive was the location where reductions to water surface elevation were being analyzed. Additional refinements storage volume, weir length and weir height, as well as the primary location of interest for water surface elevation reduction may have improved economic and flood risk reduction benefits.

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Appendix E: Civil Engineering

Cooper Creek, Denton, TX

Section 205

Closeout Report

February 2025

Engineering

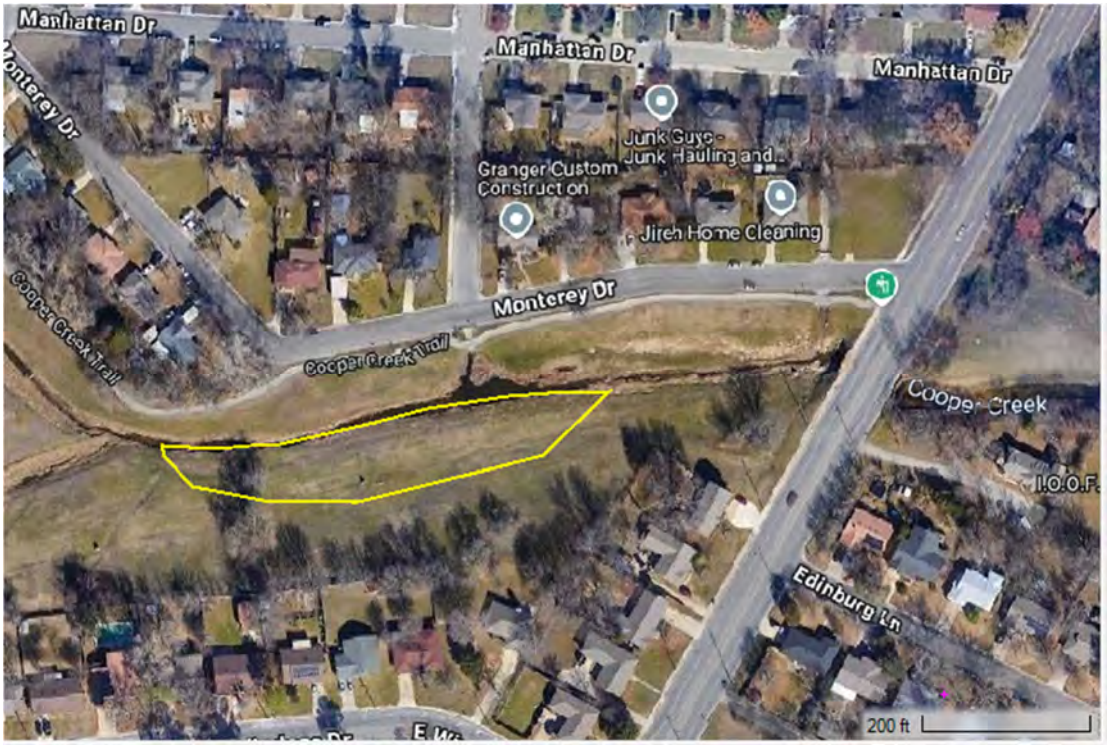
1. General

   A feasibility study took place to prepare a total of seven alternatives in Denton, Texas within the Cooper Creek channel. Due to being a feasibility study, no engineering plan sheets were prepared. All structural alternatives were found to have sub 1.0 benefit cost ratios (BCR).

2. Civil Design

   Alternative 2A1 (Detention Above Sherman Dr., Elev. 638 Feet)

   This alternative is located upstream of Sherman Drive and consists of approximately 4,800 cubic yards of earthwork to better channelize flow and reduce water surface elevation through increased cross-sectional area. The cut widens the channel by roughly 80 feet with a bottom elevation of 638 feet. This alternative would include engineering with nature features that include native plantings that can be found in Table 4.1. This alternative was found to have a BCR under 1.0.



Alternative 2C1 Detention above Stuart Rd, Elev. 637 Feet)

This alternative is located upstream of Stuart Drive and consists of a 9.3acre detention pond. 6:1 Side slopes would be graded on all sides of the pond with the bank along the creek terminating at an elevation of 640.5 feet that would act as a weir for stormwater to fill the pond under heavy flow conditions and be lined with 5mm nonwoven geotextile fabric on both sides of “weir”. All other sides would meet existing elevations. The bottom of the detention pond would

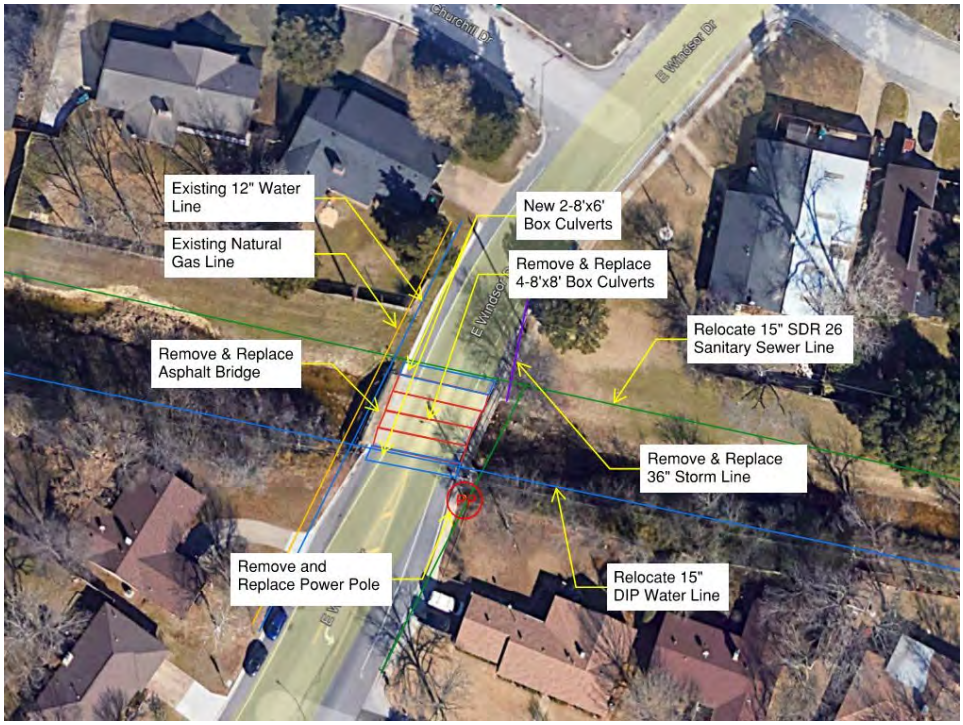
have a maximum elevation of 637 feet. Clearing and grubbing would require the removal of large number of trees that would not require replanting and 106,000 cubic yards of earthwork that would be hauled to a local landfill. The detention pond would be expected to fully drain within 24 hours through a 24” reinforced concrete pipe that outflows back into Cooper Creek on the Northeast edge of the detention pond. An existing 12” PVC sanitary sewer line parallels Cooper Creek and would require either the relocation of the line or the invert elevations to be lowered to keep a minimum of 2 feet of cover. A concrete sidewalk would be removed and replaced with like dimensions and would be meet all ADA requirements. This alternative would include engineering with nature features that include native plantings within the detention pond and can be found in Table 4.1. This alternative was found to have a BCR under 1.0.

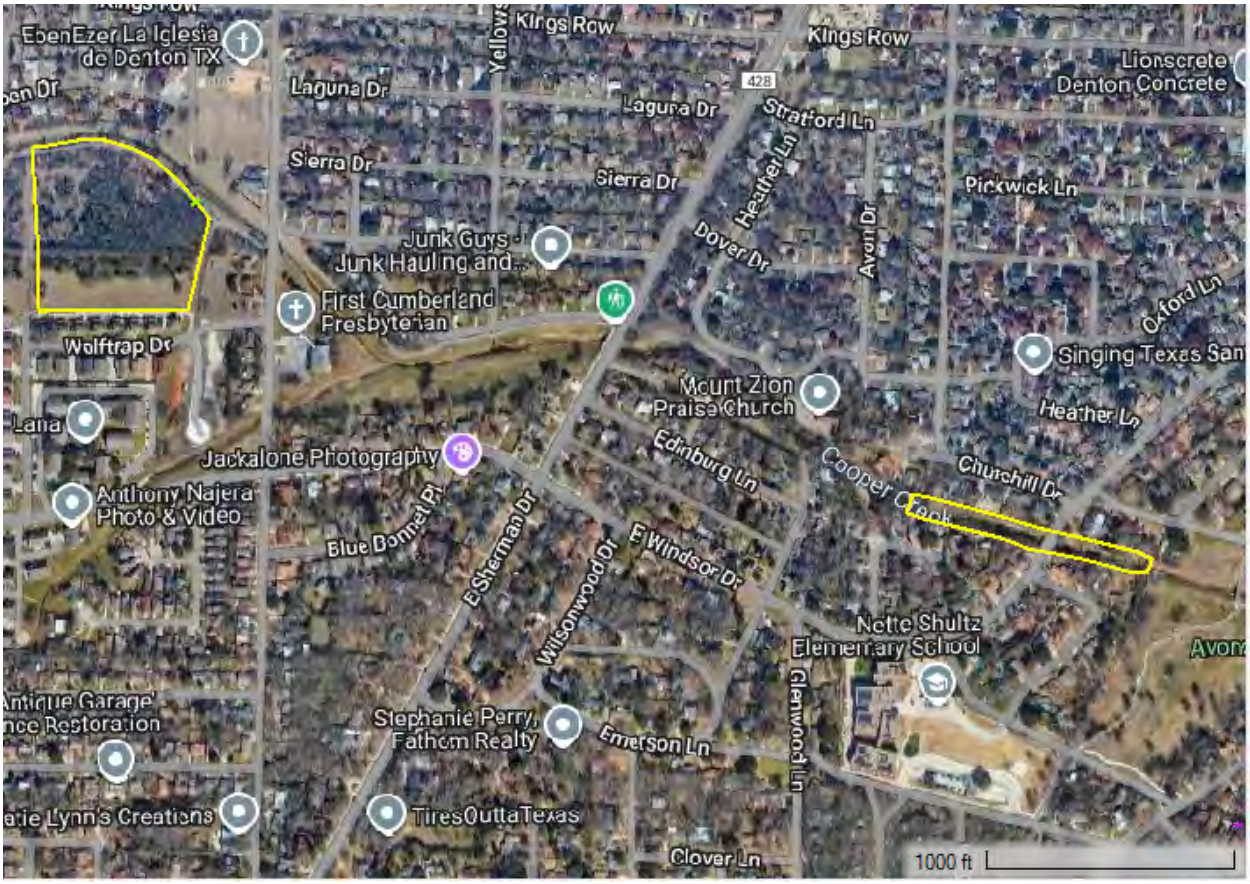
Alternative 2D1 (Detention above Stuart Rd, Elev. 634 Feet)

This alternative is located upstream of Stuart Drive in and consists of a 9.3acre detention pond. 6:1 Side slopes would be graded on all sides of the pond with the bank along the creek terminating at an elevation of 639.8 feet that would act as a weir for stormwater to fill the pond under heavy flow conditions and be lined with 5mm nonwoven geotextile fabric on both sides of “weir”. All other sides would meet existing elevations. The bottom of the detention pond would have a maximum elevation of 634 feet. Clearing and grubbing would require the removal of large number of trees that would not require replanting and 151,000 cubic yards of earthwork that would be hauled to a local landfill. The detention pond would be expected to fully drain within 24 hours through a 24” reinforced concrete pipe that outflows back into Cooper Creek on the Northeast edge of the detention pond. An existing 12” PVC sanitary sewer line parallels Cooper Creek and would require either the relocation of the line or the invert elevations to be lowered to keep a minimum of 2 feet of cover. A concrete sidewalk would be removed and replaced with like dimensions and would be meet all ADA requirements. This alternative would include engineering with nature features that include native plantings within the detention pond and can be found in Table 4.1. This alternative was found to have a BCR under 1.0.

Alternative 3A1 (Detention (2C1) + Channelization at Windsor Dr.)

This alternative includes the detention from alternative 2C1 and channelization around Windsor Rd. The channelization included approximately 850 feet of grass lined channel improvement with a bottom width of 30 feet and side slopes of 3 horizontal to 1 vertical. The total excavation amount for this alternative is 110,400 cubic yards. All required construction from Alternative 2C1 would take place within this alternative. In addition to this, Windsor drive includes multiple existing utilities and a bridge that would be required to be removed and replaced. Currently, the bridge has 50-foot width and 4-8 foot by 8-foot box culverts. This alternative would widen the channel at the crossing to house a total of 6 box culverts under the bridge, 4-8 foot by 8-foot box culverts and 2-8 foot by 6-foot box culverts. This alternative requires relocation of a 15" ductile iron pipe water line, 15" PVC sanitary sewer line, and sanitary sewer manholes and a 36" RCP storm drain would be reinstalled on the south bank. An existing power pole would need to be relocated and the bridge would require reconstruction with 12" asphalt pavement. Channel slope stabilization, such as 5mm nonwoven geotextile fabric, would be installed to reduce erosion after bare earthwork along the channel sides in addition to native plantings such as those found in table 4.1. This alternative was found to have a BCR under 1.0.

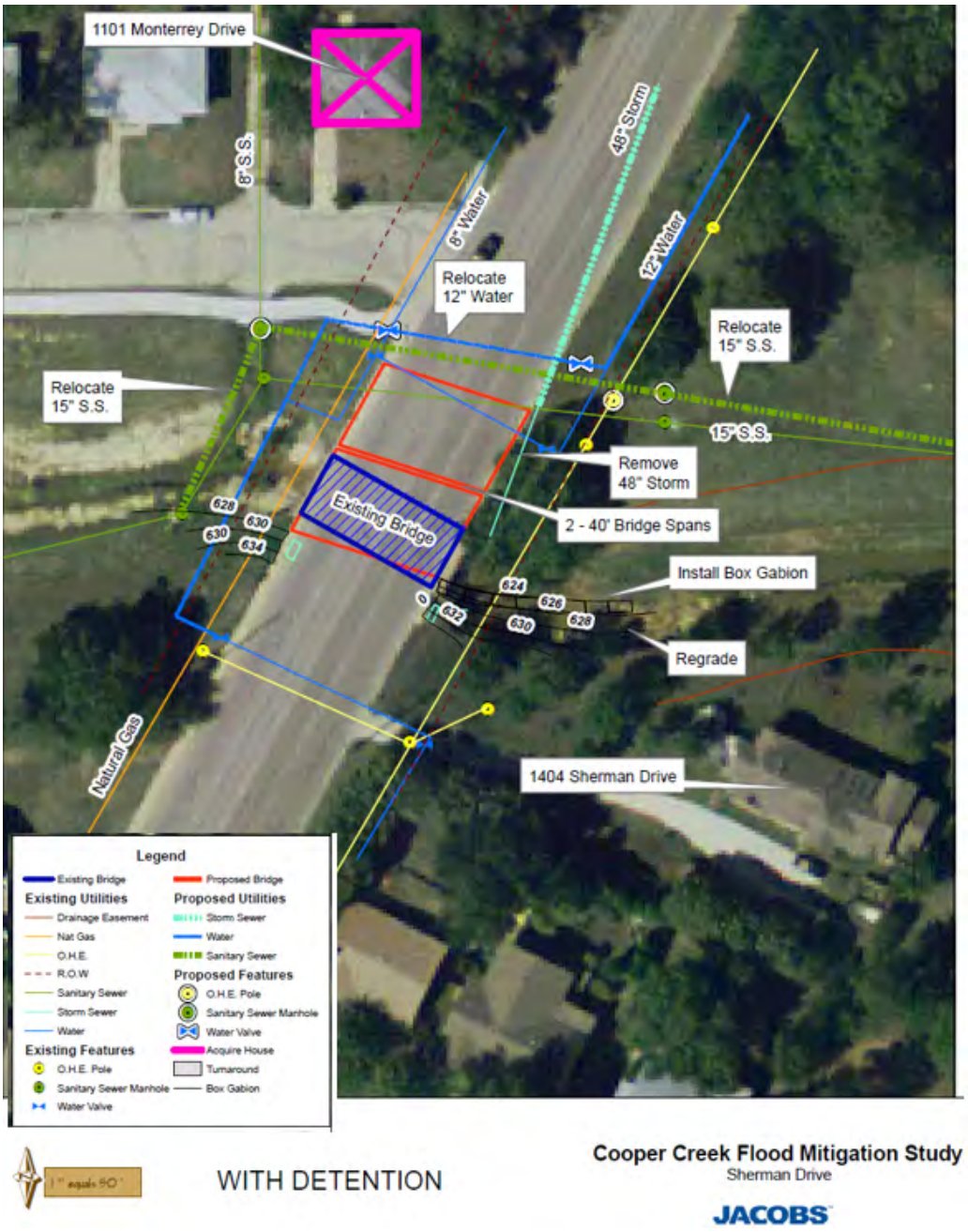




Alternative 5A1 (Detention 2C1) and Bridge improvements at Sherman Dr.)

Alternative 5A1 involves an existing crossing located at Sherman Drive and the previous alternative 2C1. The bridge opening would be widened to 2 40' spans with wingwalls to increase flow under the bridge from a cross sectional area of 210 square feet to 640 square feet. This alternative requires relocation of a 12" ductile iron pipe water line, 15" PVC sanitary sewer line, and sanitary sewer manholes and a 48" RCP storm drain would be reinstalled on the north bank. An existing power pole would need to be relocated and the bridge would require repair with 12" asphalt pavement. The detention location is located upstream of Stuart Drive and consists of a 9.3acre detention pond. 6:1 Side slopes would be graded on all sides of the pond with the bank along the creek terminating at an elevation of 640.5 feet that would act as a weir for stormwater to fill the pond under heavy flow conditions and be lined with 5mm nonwoven geotextile fabric on both sides of "weir". All other sides would meet existing elevations. The bottom of the detention pond would have a maximum elevation of 637 feet. Clearing and grubbing would require the removal of large number of trees that would not require replanting and 106,000 cubic yards of earthwork that would be hauled to a local landfill. The detention pond would be expected to fully drain within 24 hours through a 24" reinforced concrete pipe that outflows back into Cooper Creek on the Northeast edge of the detention pond. An existing 12" PVC sanitary sewer line parallels Cooper Creek and would require either the

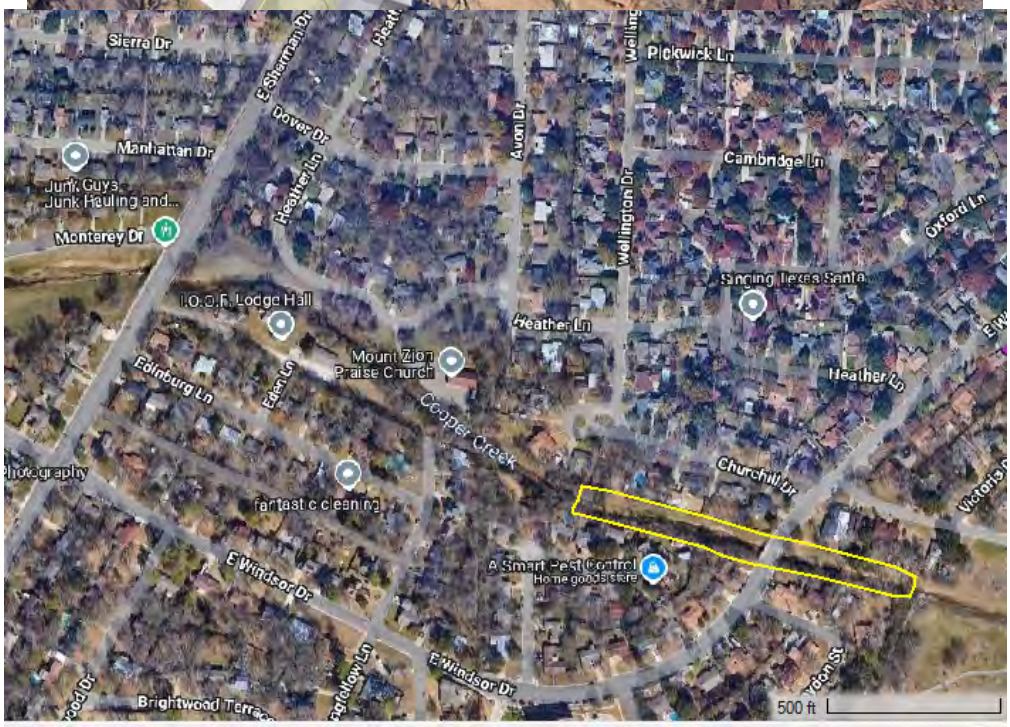
relocation of the line or the invert elevations to be lowered to keep a minimum of 2 feet of cover. A concrete sidewalk would be removed and replaced with like dimensions and would be meet all ADA requirements. Channel slope stabilization of 5mm nonwoven geotextile fabric would be installed to reduce erosion in addition to native plantings that can be found in Table 4.1. This alternative was found to have a BCR under 1.0.



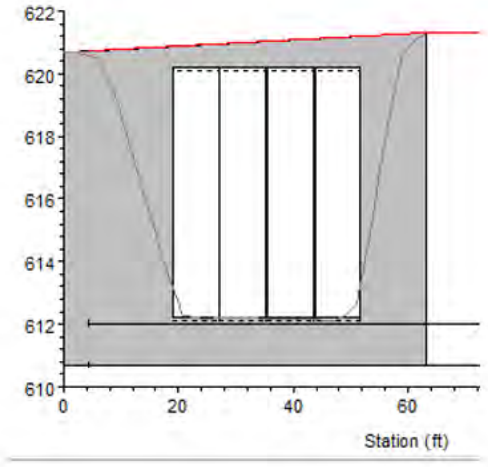
Alternative 8A1 (Channelization and Bridge Improvement at Windsor Dr.)

This alternative is located at the bridge crossing of Windsor Drive. Windsor drive includes multiple existing utilities and a bridge that would required to be removed and replaced. Currently, the bridge has a 50-foot width and 4-8 foot by 8-foot box culverts. This alternative would widen the channel at the crossing to house a total of 6 box culvert under the bridge, 4-8 foot by 8-foot box culverts and 2-6 foot by 6-foot box culverts. In addition. The invert elevations of the box culverts would reduce from the existing 612.4 feet to approximately 611.3. This alternative requires relocation of a 15" ductile iron pipe water line, 15" PVC sanitary sewer line, and sanitary sewer manholes. A 36" RCP storm drain would

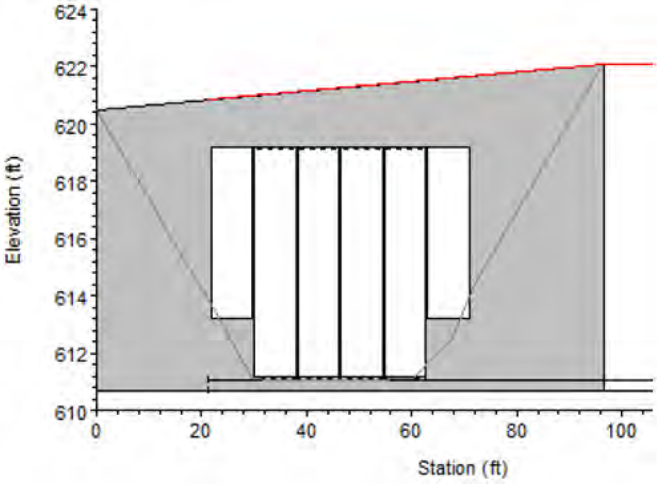
be reinstalled on the south bank within a non-standard cast in place headwall structure. An existing power pole would need to be relocated and the bridge would require reconstruction with 12” asphalt pavement. Approximately, 4,400 cubic yards of earthwork would be required and channel slope stabilization, such as 5mm nonwoven geotextile fabric, would be installed to reduce erosion after bare earthwork along the channel sides in addition to native plantings such as those found in table 4.1. This alternative was found to have a BCR under 1.0.



Without Project



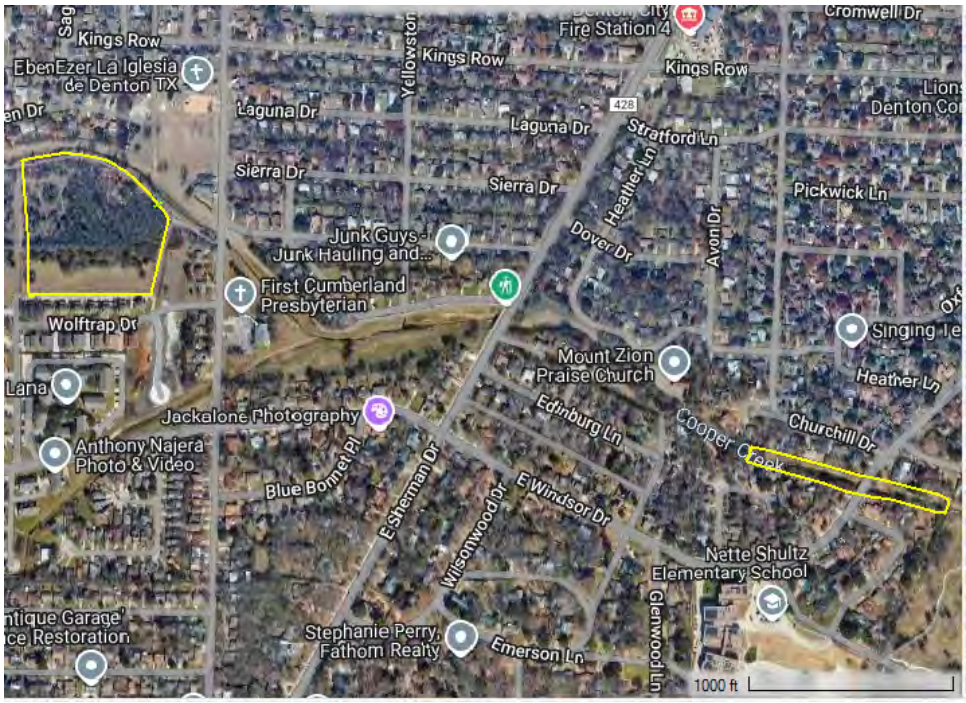
With-project



Alternative 17A1 (Detention (2C1)+Bridge Improvements (8A1)+Channelization (8A1))

This alternative is a combination of previous alternatives 2C1 and 8A1. Alternative 2C1 is located upstream of Stuart Drive and consists of a 9.3acre detention pond. 6:1 Side slopes would be graded on all sides of the pond with the bank along the creek terminating at an elevation of 640.5 feet that would act as a weir for stormwater to fill the pond under heavy flow conditions and be lined with 5mm nonwoven geotextile fabric on both sides of "weir". All other sides would meet existing elevations. The bottom of the detention pond would have a maximum elevation of 637 feet. Clearing and grubbing would require the removal of large number of trees that would not require replanting and 106,000 cubic yards of earthwork that would be hauled to a local landfill. The detention pond would be expected to fully drain within 24 hours through a 24" reinforced concrete pipe that outflows back into Cooper Creek on the Northeast edge of the detention pond. An existing 12" PVC sanitary sewer line parallels Cooper

Creek and would require either the relocation of the line or the invert elevations to be lowered to keep a minimum of 2 feet of cover. A concrete sidewalk would be removed and replaced with like dimensions and would be meet all ADA requirements. This alternative would include engineering with nature features that include native plantings within the detention pond and can be found in Table 4.1. This alternative is located at the bridge crossing of Windsor Drive. Windsor drive includes multiple existing utilities and a bridge that would required to be removed and replaced. Currently, the bridge has a 50-foot width and 4-8 foot by 8-foot box culverts. This alternative would widen the channel at the crossing to house a total of 6 box culvert under the bridge, 4-8 foot by 8-foot box culverts and 2-6 foot by 6-foot box culverts. In addition. The invert elevations of the box culverts would reduce from the existing 612.4 feet to approximately 611.3. This alternative requires relocation of a 15" ductile iron pipe water line, 15" PVC sanitary sewer line, and sanitary sewer manholes. A 36" RCP storm drain would be reinstalled on the south bank within a non-standard cast in place headwall structure. An existing power pole would need to be relocated and the bridge would require reconstruction with 12" asphalt pavement. Approximately, 4,400 cubic yards of earthwork would be required and channel slope stabilization, such as 5mm nonwoven geotextile fabric, would be installed to reduce erosion after bare earthwork along the channel sides in addition to native plantings such as those found in table 4.1. This alternative was found to have a BCR under 1.0.



3. Construction Procedures

Construction Access

Haul routes, traffic control plans, and construction access would vary based on the alternative(s) chosen and would be chosen to minimize disruption to local traffic.

Pavement Repair

Due to construction traffic, it is anticipated that local roads would be damaged and require repair.

Laydown Areas

Laydown areas for construction material and equipment would be required and would be decided based on the alternative(s) chosen.

4. Native Plantings

In an effort to provide cost-effective, self-sustaining alternatives to traditionally engineered flood management, the planting list in Table 4.1 would be used to replant all disturbed areas due to them being native to the area of the North Texas, having deep root systems that help resist erosion of soil, and their drought tolerance.

Table 4.1 Planting List

Common Name	Botanical Name	Classificaiton
Big Bluestem	Andropogon gerardii	Grass
Switchgrass	Panicum virgatum var "Shenandoah'	Grass
Turf's Cap	Malvaviscus arboreus var. drummondii	Forb
Little Bluestem	Schizachyrium scoparium	Grass
Blue Grama	Bouteloua gracilis	Grass
Eastern Gamagrass	Tripsacum dactyloides	Grass
Plains Coreopsis	Coreopsis tinctoria	Forb
Maximilian Sunflower	Helianthus maximiliani	Forb
Sideoats Grama	Bouteloua curtipendula	Grass

Appendix F: Geotechnical

Cooper Creek, Denton, TX

Section 205

Closeout Report

February 2025

1.0 Introduction

This report documents the results of a geotechnical evaluation performed for the Cooper Creek Section 205 flood risk management project in Denton, Texas. The scope of the investigation was to obtain a historical prospective of the site, identify surface and subsurface conditions, and address geotechnical concerns relevant to the project. This report presents a summary of the findings based on hi storical documents and site observations. This report also includes a preliminary assessment of the geotechnical considerations for the future-with-project conditions from five screened alternatives. The alternatives listed in the table below incorporate either one or a combination of options intended to mitigate flooding impacting the surrounding residential community including, detention basins at E Sherman Dr or Stuart Rd, channelization improvements at E Windsor Dr, and bridge culvert modifications at E Sherman Dr.

Alternative 2 – Detention Basin alone	**(2A1) Detention above E Sherman Dr**
	(2C1) Detention above Stuart Rd (elev 637)
	(2D1) Detention above Stuart Rd (elev 634)
Alternative 3 – Detention Basin and Channel Improvements	**Detention (2C1) with channelization at E Windsor Dr.**
Alternative 5 – Detention Basin and Bridge Culvert Modifications	**Detention (2C1) with bridge improvement at E Sherman Dr.**
Alternative 8 – Channel Improvements and Bridge Culvert Modifications	**Channelization and bridge improvements at E Windsor Dr.**
Alternative 17- Detention Basin, Bridge Culvert Modifications, Channel Improvements	**Detention (2C1) with channelization and bridge improvements at E Windsor Dr.**

2.0 Existing Conditions

2.1. Location and Description

Cooper Creek stretches across the northeastern portion of the City of Denton, Texas. The creek flows to the southeast through a primarily residential portion of the city and feeds into Lewisville Lake. The watershed of Cooper Creek is about 6.1 miles long and conveys a drainage area of approximately 9.64 s quare miles. The creek is generally small but well defined, mostly unimproved channel with several tributaries. The main channel has an average depth of 6 feet, top width of 50 f eet and a slope of 25 f eet per mile. T he creek is normally dry with flow occurring during periods of heavy rainfall. Cooper Creek is generally a trapezoidal, unlined earthen channel. There are several culvert crossings that have limited capacity and cause backwater conditions within the stream channel. The 100-year floodplain generally extends beyond the stream banks and into the residential yards. Existing detention ponds were constructed within Cooper Creek watershed to reduce flood damages along the creek. There is some channel erosion along Cooper Creek due to high velocities in the channel.

2.2. Geology

The project area is in a region known as the Eastern Cross Timbers Ecoregion. This region extends southward from the Red River through eastern Denton County and along the boundary between Dallas and Tarrant counties. It then stretches through Johnson County to the Brazos River and into Hill County (Butler, 2022). The region includes rolling hills, cuestas, and ridges. Soils within the Cross Timbers are mostly sandy, loamy, and are underlain by s and, shale, clay, sandstone, calcareous shale, and limestone. Today, livestock farming is the main land use, but some cropland also occurs (TPWD-A 2024). The City of Denton sits on top of the Grayson Marl rock formation. Grayson Marl, mostly marl, is light-greenish-gray to medium-gray, weathers to grayish yellow. Thickness of Grayson Marl in Texas is between 15 and 60 feet (USGS, 2024).

3.0 Previous Investigations

3.1. Site Visit

A site visit to Cooper Creek was conducted by the Fort Worth District project team on June 18, 2024. During the site trip, representatives from the City of Denton accompanied the project team and identified several problematic locations where existing infrastructure was being adversely impacted during flooding events. The following excerpt from draft feasibility report briefly describes the pressing inundations issues affecting the existing infrastructure. Beginning downstream, Cooper Creek crosses Mingo Road. Mingo Road currently is overtopped during flooding events, affecting emergency response and evacuation times, but does not create backwater affects nor damage to any structures directly upstream from the crossing. The Nottingham Drive crossing is just downstream of Avondale Park; flooding seems to cause minimal structural damages at this point, however, there is evidence of bank erosion downstream of this location. At East Sherman Drive, a bend occurs directly at the crossing with the low-lying area occurring just upstream and to the north of the crossing. Overloading and surcharging of the local storm drain system is likely during flooding events, with this location having the most properties experiencing flooding. The upstream limit of the project area does not appear to include any structures that experience flooding will likely not fall within the scope of this project.

3.2. Historical Geotech Report

In lieu of performing a geotechnical investigation, a historic geotechnical document provided by the City of Denton, titled *Report 187-08-06 Geotechnical Engineering Services, Cooper Creek Detention Pond*, was utilized to inform and characterize the potential subsurface. In 2008, four (4) borings were drilled by CMJ Engineering, Inc. down to 12 and 17 feet below ground surface. The borings were obtained at three different locations that coincidentally surround the primary site for the proposed work at E Sherman Dr and E Windsor Dr. The closest borings were drilled at Sites 2 and 3, which are located approximately 4000-feet northwest and 3800-feet southwest from the proposed work at E Sherman Dr, respectively. Site 1 is located approximately 6000-feet east of the proposed work site. No groundwater was observed in the borings during drilling or at the time of completion.

Boring logs indicate that overburden material consisting of sandy, silty, and shaly clays were encountered from the surface down to depths of about 4 feet (in the two 17-feet-deep borings) at Site 2, while overburden material was encountered down to boring termination (in the two 12-feet-deep borings) at Sites 1 and 3. These clay soils were characterized as having very stiff to hard consistencies, moisture contents ranging from 6% to 21%, with colors ranging from dark brown, brown, reddish brown, to light brown.

The primary formation was only encountered at Site 2, which typically consisted of tan limestone down to depths of 10 to 15 feet, underlain by gray shale extending down to 15 and 17 feet below ground surface. Clay seams were observed throughout the limestone. Both the limestone and shale primary were classified as moderately hard to hard.

4.0 Future With Project Conditions

Flood protection is primarily provided by an unlined earthen channel. The channel bottom and slopes soils were observed to be primarily sandy, silty, and shaly clays with the occasional limestone outcrop. The existing channel is inadequate to provide flood protection with the 100-year plain generally extending beyond the stream banks and into residential yards.

A total of five project alternatives are being selected for the future with project conditions. Of these alternatives, one alternative considers three different detention basin designs with one detention basin design at E Sherman Dr and two different detention designs at Stuart Rd. The final four alternatives incorporate a combination of the elev. 637 S tuart Rd detention basin design, with the channelization improvements or the bridge/culvert modifications to mitigate flooding. The alternatives are listed below.

4.1. Alternative 1: No Action (Future Without Project Conditions).

Alternative 1 is No Action. If no action is taken the current situation with flooding would continue to occur or become more frequent as the unlined channel deteriorates.

4.2. Alternative 2: Detention Basin alone.

Alternative 2 would consist of designing and constructing a detention basin in the vicinity of Cooper Creek. The detention basins would provide additional storage capacity to the creek during flooding and rainfall events, mitigating the inundation issues in the surrounding residents.

- Alternative 2A1 considers the excavation and construction of a detention basin to the east of E Sherman Dr. The proposed design would widen the existing channel bottom (approximately at elevation 628 feet) by about 100-feet. An estimated 4,800 cubic yards of native soil/rock is expected to be excavated.

- Alternative 2C1 considers the construction of a detention basin to the east of Stuart Rd. The proposed design incorporates a basin bottom at elevation 637 feet and weir at elevation 640.5 feet. An estimated 106,000 cubic yards of native soil/rock is expected to be excavated.

- Alternative 2D1 considers the construction of a detention basin at the same location as 2C1, listed above. Except, this proposed design incorporates a basin bottom at elevation 634 feet and weir at elevation 639.8 feet. An estimated 151,000 cubic yards of native soil/rock is expected to be excavated.

4.3. Alternative 3: Detention Basin and Channel Improvements.

Alternative 3 includes detention basin design from Alternative 2C1 and the channel improvement

proposed in Alternative 8. The proposed channel improvement would incorporate straightening an 842-foot-long section of Cooper Creek at E Windsor Dr as well as deepening or widening the channel. An estimated 106,000 cubic yards of native soil/rock is expected to be excavated for the detention basin, and approximately 4,400 cubic yards is expected to be excavated from the channel improvement. In total, approximately 110,400 cubic yards of soil/rock will need to be excavated.

4.4. Alternative 5: Detention Basin and Bridge Culvert Modifications.

Alternative 5 includes detention basin design from Alternative 2C1 as well as adding or modifying the box culvert/ bridge at Sherman Drive, Mingo Road, and/or Blagg Road to increase hydraulic capacity. An estimated 106,000 cubic yards of native soil/rock is expected to be excavated for the detention basin.

4.5. Alternative 8: Channel Improvements and Bridge culvert modifications.

Alternative 8 includes channel improvements such as straightening and deepening or widening an 842-feet-long section of Cooper Creek near E. Windsor Dr as well as adding or modifying the box culvert/ bridge at Sherman Drive, Mingo Road, and/or Blagg Road to increase hydraulic capacity. A typical section for of the completed channel improvement will incorporate 3 to 1 (horizontal to vertical) slopes, resulting in approximately 4,400 cubic yards of expected soil/rock excavation.

4.6. Alternative 17: Detention Basin, Bridge culvert modifications, Channel improvements.

Alternative 17 includes detention basin design from Alternative 2C1, the channel improvements from Alternative 8, as well as adding or modifying the box culvert/ bridge at Sherman Drive, Mingo Road, and/or Blagg Road to increase hydraulic capacity. An estimated 106,000 cubic yards of native soil/rock is expected to be excavated for the detention basin, and approximately 4,400 cubic yards is expected to be excavated from the channel improvement. In total, approximately 110,400 cubic yards of soil/rock will need to be excavated.

5.0 Considerations

5.1. Excavation Concerns

Based upon information gathered during a site visit and borings from CMJ Engineering's geotechnical report, both the sandy, silty, and shaly clay overburden material and the limestone/shale primary material are expected to be encountered at the surface and during excavation of the detention basin and channel improvements. It is expected that the excavation of denser and harder limestone or shale primary will likely incur a considerable increase to cost, and effort compared to the conventional earthwork equipment used for overburden soils. Additionally, should sands be encountered during excavation, precautions to prevent caving should be considered.

Additional costs and design changes could also be later incurred in the event shale is encountered during excavation at the channel improvement and detention basin sites. When primary shales are unloaded and exposed to the surface and to weathering, significant swell/shrinkage can occur. The presence of exposed shale along the surface of the slopes or bottom at either the channel or detention basin could present significant potential erosion and heave concerns. A subsurface investigation could mitigate some uncertainties.

5.2. Earthwork Concerns

Slope stability is major concern for nearly all earthen embankments, especially when subjected to various loading and drawdown conditions from inundation. Permanent slopes at the site should be as flat as practical to reduce the potential for shallow slides and erosion. Currently, the channel improvement design incorporates a 3H:1V slope for the final channel profile with a channel depth at approximately 9 feet. The following table for maximum slope angles was recommended by CMJ Engineering for similar detention pond designs at Cooper Creek.

Height (ft)	Slope (Horizontal : Vertical)
0-3	1:1
3-6	2:1
6-9	3:1
>9	4:1

5.3. Conclusion

The Project Delivery Team concluded that the BCR (benefit-to-cost ratio) for the selected project alternatives would not be sufficient to meet the threshold (BCR>1) required to justify the proposed work. Should any of the selected project alternatives be proposed or reconsidered, a

subsurface exploration program and a more detailed engineering analysis is required before final geotechnical recommendations for the design and construction of the proposed detention basin and channel improvements can be made. Without sufficient subsurface sampling and testing within the immediate vicinity of the proposed detention basin and channel improvement locations, costs may vary significantly. Additionally, on-site permeability testing should be conducted at all proposed detention basin construction sites.

6.0 References

- Butler D.R., Ecoregions of Texas 2022. https://texasalmanac.com/topics/environment/physical-regions-texas Accessed July 3, 2024.

- Texas Parks and Wildlife Department - A. 2024. Texas Ecoregions. https://tpwd.texas.gov/education/hunter-education/online-course/wildlife-conservation/texas-ecoregions

- United States Geological Survey, *Geologic Atlas of Texas 2024*. https://webapps.usgs.gov/txgeology/ Accessed July 3, 2024.

- CMJ Engineering, Inc (2008). *Report 187-08-06 Geotechnical Engineering Services, Cooper Creek Detention Pond, Three Sites, Denton, Texas.*

US Army Corps
of Engineers

REAL ESTATE APPENDIX

Cooper Creek
Continuing Authorities Program: Section 205
Flood Risk Management
Denton, Texas

Updated: 10 January 2025

Prepared By: Justin Weeks
Realty Specialist
US Army Corps of Engineers
Fort Worth District
819 Taylor Street
Fort Worth, TX 76102

Real Estate Considerations/Problems in Area

Cooper Creek, and much of the surrounding City of Denton, Texas, is widely developed with residential housing resulting in little available land within the study area. Over the course of the CAP 205 study, the Real Estate Division advised the team of their available resources and constraints to use on potential project lands. City representatives were informed of what actions were necessary as a Non-Federal Sponsor (NFS) and their requirement of providing Lands, Easements, Rights of Way, Relocations, and Disposal Areas (LERRD). District real estate appraisal staff performed an appraisal cost analysis to support plan formulation.

Engineering Regulation ER 405-1-12 Chapter 12 requires the Real Estate Division to determine the minimum interest in real property necessary to construct, operate and maintain a USACE cost-shared civil works project. Once the minimum interest has been determined, the corresponding USACE standard estate must be used for the acquisition of said interest. Any deviation from the approved estates is considered non-standard and must be approved by the USACE Directorate of Real Estate. A discussion on the standard estates identified as required to support each alternative is included below.

Evaluation of Lands for Alternatives

Three primary areas were identified to support construction of the structural measures for the project. Of those, two support digging detention basins to store water in flood events, a second alternative is to arm the creek channel against further erosion and support greater flood conveyance, and the third involves culvert modifications under 2 separate bridges within the areas of the previous alternatives. There are several modifications that involve combinations of the above. District economists also evaluated non-structural alternatives of buyouts, and raising of structures within 10-, 25-, and 50-year flood events. These alternatives will be discussed further in the economics appendix. All alternatives considered by the Real Estate Division are shown in table 1, below.

ALTERNATIVE	PLAN	DESCRIPTION
1 – No Action		
2 – Detention basin alone	2A1	Detention above Sherman
	2C1	Detention above Stuart (elev 637)
	2D1	Detention above Stuart (elev 634)
3 – Detention basin and channel improvements	3A1	Detention (2C1) + channelization at Windsor Dr.
5 – Detention basin and bridge culvert modifications	5A1	Detention (2C1) and bridge improvement at Sherman Dr.
8 – Channel improvements and bridge culvert modifications	8A1	Channelization and bridge improvement at Windsor Dr.
17 – Detention basin, bridge culvert modifications, channel improvements	17A1	Detention (2C1) + bridge improvement (8A1) + channelization (8A1)

Table 1. Alternatives considered during feasibility stage of Cooper Creek CAP Section 205 Study.

Alternative 2A1

Alternative 2A1 involves creation of a detention pond along the existing channel within Denton County Appraisal District (DCAD) parcel number 84607. This parcel is owned in fee by the City Parks Department, no additional acquisition would be necessary. During the site visit the project delivery team identified two existing sewer lines that would require relocation through some form of combination of a 12” and 15” into one 18” line off property. The city valuated said relocation at approximately $525,000. Utility and facility relocations are responsibility of the sponsor and submittable for credit as LERRD.

Figure 1. Area of impact for alternative

Alternatives 2C1/2D1

Alternatives 2C1 and 2D1 both utilize DCAD parcel number 39529 owned by Trans-Atlas Financial, LLC. Both require the same surface acreage but differ in the maximum volume of disposal material to be removed. Due to much of the parcel being necessary for the work to be done it was evaluated as a fee ownership take. The area for these two alternatives is shown below in figure 2.

Figure 2. Area to be acquired for alternatives 2C1 and 2D1.

Alternative 8A1

Alternative 8A1 involves channelization measures to be performed upstream and downstream of E. Windsor Drive. This work would impact 21 private residences where the creek has eroded into the backyards of the homes and the city would be required to acquire a channel improvement easement over the lands. According to City plat records, the landowners on either side of the creek hold fee title to the lands to the centerline of Cooper Creek, and the city holds a drainage easement over the creek. The city provided said drainage easement and associated figures to the Real Estate Division for review. The provided easements do not meet the minimum requirements of the USACE Channel Improvement Easement and therefore the city was informed that further acquisition would be necessary. These deeds, plats and associated figures are included as Addendum 1 to this report.

Alternative 8A1 also involves culvert modification under the E. Windsor Drive bridge over Cooper Creek. The bridge would be removed, the culverts would be upgraded to allow greater flow under the bridge, and the bridge would then be replaced. Bridge and other road modifications are included as public facility relocations and a duty of the sponsor as a portion of the LERRD required for the project as described in ER 1165-2-131. As such this modification was included as a relocation within the project cost estimate.

Figure 3. Area to be acquired for alternative 8A1.

Alternative 5A1

Alternative 5A1 involves a similar bridge culvert modification within 8A1 under E. Sherman Drive, downstream from the proposed area of 2A1. This modification was also treated as a public facility relocation to be performed by the sponsor and costed in the project cost estimate. The area is shown on figure 4, below.

Figure 4. Area of bridge culvert modifications required for alternative 5A1.

Schedule and Real Estate Capability Assessment

The Real Estate Division met with the PDT and representatives from the City of Denton (including engineering staff, Real Estate, and the Parks Department staff) to perform an acquisition capability assessment as required for a typical Real Estate Planning Report. Overall, the sponsor was deemed to be capable of performing the acquisition and any necessary relocations in accordance with P.L. 91-646 (The Uniform Relocation Act). However, the city representatives expressed unwillingness to acquire any private residences through condemnation authority which could pose a risk to project timeline and viability. Additionally, the city expressed the desire to hire an outside consultant to handle any relocations. USACE has allowed other non-federal sponsors to do so on other projects and therefore this was determined acceptable for this stage of planning. During the same meeting, the overall project acquisition schedule was discussed with emphasis on timelines and periods of performance that can be expected for typical deliverables related to the acquisition. Typical contracts for surveys, appraisals, and title work have 30 to 60-day periods; the city can close on a property in approximately 4 months from initial offer (if accepted), and the usual condemnation action takes between 1.5-2 years to complete. These estimates fall within normal for project timelines. The full capability assessment is attached as addendum 2.

Real Estate Cost Study

In agreement with Project Management, the Gross Appraisal typically required as part of the Real Estate Planning Report generated during a feasibility study would be unnecessarily costly and more detailed than necessary for this study. Therefore, SWF-RE appraisal staff preformed a cost study report. The study considered the required estates identified for each alternative and adjusted the valuation based on said estate. A Fee ownership was determined at 100% of the County Appraisal District (CAD) valuation (plus contingency) and an easement was reduced slightly to 90% of CAD (again, plus some contingency). The full cost study is attached as addendum 3. The results of the cost study are shown in the table 2, below.

Alternative	Acres needed	Cost per acre	Total Cost
2A1	0.82	$33,319	$24,590
2C1/2D1	15.14	$32,016	$484,715
8A1	1.84	$6.10/ft^2	$439,200

Table 2, cost analysis chart for the 3 primary alternatives considered.

Prepared by:

WEEKS.JUSTIN.REID.1589564690

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Justin Weeks
Realty Specialist
Fort Worth District

Reviewed by:

MINDIETA.DAVID.WADE.1283632870

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David W. Mindieta
Chief, Planning and Appraisal
Fort Worth District

H. CARTER #281
DRAINAGE

1385

THE STATE OF TEXAS §
COUNTY OF DENTON §

KNOW ALL MEN BY THESE PRESENTS:

THAT WE, Nette Shultz, Susie Beyette and Callie R. Ratliff, each being a feme sole, of Denton County, Texas, for and in consideration of the sum of One Dollar ($1.00) cash to us in hand paid and the benefits that will accrue to our property, the receipt of which is hereby acknowledged, do hereby GIVE AND GRANT unto the said City of Denton, Texas, a Municipal Corporation, the right to dig a drainage ditch and perpetually maintain an open drainage ditch in, upon and across the following described tract of land, being more particularly described as follows, to-wit:

All that certain lot, tract or parcel of land lying and being situated in the County of Denton, State of Texas, being out of the Hardin Carter Survey, Abst. No. 281, and being more particularly described as follows:

BEGINNING at a point in the west boundary line of the Hardin Carter Survey, Abst. No. 281, and being the west property line of the Nette Shultz property, same being 659 feet north, 0 deg. 27 min. east of the northeast corner of Block F of the Brentwood Addition to the City of Denton, Texas;

THENCE east from the beginning point along a 10 deg. 00 min. curve to the right, 56.50 feet to a point of tangency;

THENCE south 51 deg. 10 min. east, 85.57 feet for a point of curvature of a 12 deg. 00 min. curve to the left;

THENCE along said 12 deg. 00 min. curve to the left, 198.06 feet to a point of tangency;

THENCE south 73 deg. 56 min. east, 1,017.77 feet for a point;

THENCE north 15 deg. 04 min. east, 80 feet for a point;

THENCE north 73 deg. 56 min. west along the south boundary line of a sewer easement 20 feet wide granted to the City of Denton, Texas, by Nette Shultz by instrument dated the 6th day of December, 1955, 1002.53 feet to a point of curvature of a 12 deg. 00 min. curve to the right;

THENCE along said 12 deg. 00 min. curve to the right, 198.06 feet to a point of tangency;

THENCE north 51 deg. 10 min. west, 72.87 feet for a point of curvature of a 10 deg. 00 min. curve to the left;

THENCE along said 10 deg. 00 min. curve to the left, 107.51 feet for a point in the west property line of the Shultz property and being in the west survey line of the Hardin Carter Survey;

THENCE south 00 deg. 27 min. west, 92.89 feet to the place of beginning.

TO HAVE AND TO HOLD the same perpetually to the City of Denton, Texas, its successors and assigns, and to its agents, officers and employees, together with the right and privilege at any and all times to enter said premises for the purpose of digging and maintaining said drainage ditch.

WITNESS OUR HANDS at Denton, Texas, this 12th day of March, A. D., 1956.

Nette Shultz
Nette Shultz

Susie V. Beyette
Susie Beyette

Callie R. Ratliff
Callie R. Ratliff

****

THE STATE OF TEXAS §
COUNTY OF DENTON §

BEFORE ME, the undersigned authority, a Notary Public in and for said County and State, on this day personally appeared Nette Shultz, Susie Beyette and Callie R. Ratliff, each being a feme sole, all well known to me to be the persons whose names are subscribed to the foregoing instrument and acknowledged to me that they each executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this 12th day of March, A. D., 1956.

Dennie Lou Skelton
Notary Public in and for
Denton County, Texas

CERTIFICATE OF RECORD

The State of Texas
County of Denton

I, A. J. BARNETT, Clerk of the County Court in and for said County, do hereby certify that the foregoing instrument of writing, with its certificate of authentication was filed for record the 14 day of March A. D. 1956, at 10:25 o'clock A. M. and was recorded the 28 day of March A. D. 1956, at 10:40 o'clock A. M. in Volume 420 Page 122 of the Deed Records of Denton County, Texas.

Witness my hand and seal of office at Denton, Texas, the day and year last above written.

A. J. BARNETT
Clerk of the County Court, Denton Co., Texas

By Geraldine Foster Deputy

C. F. BALLARD & ASSOCIATES, INC.
REGISTERED CIVIL ENGINEERS & SURVEYORS
218 NORTH AUSTIN PHONE (817) 387-0506
DENTON, TEXAS 76201

March 21, 1974

REVISED FIELD NOTES:

DESCRIPTION OF 11.131 ACRE SECTION FOUR AVONDALE ADDITION TO DENTON:

All that certain tract or parcel of land situated in the City and County of Denton Texas, owned by Builders Developers Company constituting SECTION FOUR OF AVONDALE ADDITION to said City, and being more particularly described as follows:

BEGINNING at the Northernmost corner of Lot 19, Block J, of Section Two of said Addition;

THENCE following the North line of Lots 20 through 28 of said Block J, the following 5 courses and distances: (1) N. 47° 08' 30" E. 109.5 feet, (2) N. 64° 20' 41" E. 299.29 feet, (3) N. 72° 24' 34" E. 197.56 feet, (4) N. 78° 11' 02" E. 176.64 feet, and (5) N. 87° 35' 12" E. 130.21 feet to a corner on the West line of Pickwick Lane:

THENCEN. 82° 36' 24" E. 50.29 feet across Pickwick Lane to the Northwest corner of Lot 1, Block R, SECTION FOUR:

THENCE N. 78° 51' 20" E. with the North line of Lots 1 and 2, a distance of 149.5 feet to a corner;

THENCE S. 65° 51' 40" E. 53.63 feet to the Northwest corner of Lots 3, Block R;

THENCE N. 88° 45' 40" E. 108.82 feet to the Northeast corner of Lot 3 on the West line of Nottingham Drive;

THENCE S. 78° 51' 03" E. across Nottingham Drive 72.12 feet to the Northwest corner of Lot 1, Block Q;

THENCE N. 80° 29" 21" E. 175.31 feet to the Northeast corner of Lot 1, Block Q;

THENCE S. 3° 02' 30" W. with the East line of Section Four and crossing Windsor Drive 401.35 feet to the Southeast corner of Lot 6, Block P of this Section;

THENCE N. 85° 32' 50" W. 125.04 feet to the Southwest corner of Lot 6 on the East line of Nottingham Drive;

THENCE S. 86° 42' 24" W. across Nottingham Drive 60.37 feet to the Southeast corner of Lot 20, Block H of this Section;

Avondale
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1974

A-126

THENCE Westerly with the South lines of Lots 8 through 18, and 20 the following 6 courses and distances: (1) N. 85° 40' 27" W. 347.45 feet, (2) S. 85° 04' W. 171.86 feet (3) S. 79° 32' 10" W. 102.0 feet (4) S. 73° 38' 50" W. 102.02 feet (5) S. 67° 50' 20" W. 102.02 feet and (6) S. 60° 44' W. 232.9 feet to the Southernmost corner of Lot 8, herein, same being the Easternmost corner of Lot 7, Block 8, Section Two;

THENCE N. 42° 53' 06" W. 122.5 feet to the Westernmost corner of Lot 8 on the Southerly line of Windsor Drive;

THENCE N. 37° 48' 31" W. across Windsor Drive 80.02 feet to the Southernmost corner of Lot 20;

THENCE N. 42° 59' 11" W. 127.79 feet to the place of beginning, containing in all 11.131 acres of land.

THE STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF DENTON §

19258

WHEREAS, on the 15th day of January, 1964, Foxworth-Galbraith Lumber Company executed, acknowledged and delivered to Builders Development Company, a corporation, a certain Deed, conveying a 153.86 acre tract of land, out of the John Carter, Hardin Carter, W. Pogue and S. McCracken Surveys, said Deed being recorded in Volume 503, Page 640 of the Deed Records of Denton County, Texas; and

WHEREAS, Builders Development Company, being the sole owner of said property, desires to plat a portion of said property into an Addition to be known as Avondale Addition, Section Four, to the City of Denton, Texas.

NOW, THEREFORE, KNOW ALL MEN BY THESE PRESENTS that Builders Development Company, a corporation, acting herein, by and through its undersigned officers, does hereby make and adopt the plat this day filed of the hereinafter described property, to be known as Avondale Addition, Section Four, to the City of Denton, Texas, said property platted being more particularly described as follows:

BEGINNING at the Northernmost corner of Lot 19, Block J, of Avondale Addition, Section Two,

THENCE following the North line of Lots 20 through 28 of said Block J, the following 5 courses and distances: (1) N. 47° 05' 30" E. 109.5 feet, (2) N. 64° 20' 41" E. 299.29 feet, (3) N. 72° 24' 34" E. 197.56 feet, (4) N. 78° 11' 02" E. 176.64 feet, and (5) N. 87° 35' 12" E. 130.21 feet, to a corner on the West line of Pickwick Lane;

THENCE N. 82° 36' 24" E. 50.29 feet across Pickwick Lane to the Northwest corner of Lot 1, Block R, of this Section;

THENCE N. 78° 51' 20" E. with the North line of Lots 1 and 2, a distance of 149.5 feet to a corner;

THENCE S. 65° 51' 40" E. 53.63 feet to the Northwest corner of Lot 3, Block R of this Section;

THENCE N. 88° 45' 40" E. 108.82 feet to the Northeast corner of Lot 3, on the West line of Nottingham Drive;

THENCE S. 78° 51' 03" E. across Nottingham Drive 72.12 feet to the Northwest corner of Lot 1, Block Q of this Section;

THENCE N. 80° 29' 21" E. 175.31 feet to the Northeast corner of Lot 1, Block Q of this Section;

THENCE S. 3° 02' 30" W. with the East line of Section Four and crossing Windsor Drive 397.53 feet to the Southeast corner of Lot 6, Block P of this Section;

THENCE N. 86° 57' 30" W. 125.0 feet to the Southwest corner of Lot 6, on the East line of Nottingham Drive;

THENCE S. 86° 00' 52" W. across Nottingham Drive 60.45 feet to the Southeast corner of Lot 20, Block H, of this Section;

THENCE Westerly with the South lines of Lots 8 through 18, and 20, the following 6 courses and distances: (1) N. 85° 40' 27" W. 347.45 feet, (2) S. 85° 04' W. 171.86 feet, (3) S. 79° 32' 10" W. 102.0 feet, (4) S. 73° 38' 50" W. 102.02 feet, (5) S. 67° 50' 20" W. 102.02 feet and (6) S. 60° 44' W. 232.9 feet to the Southernmost corner of Lot 8, Block H, herein, same being the Easternmost corner of Lot 7, Block H, Avondale Addition, Section Two;

THENCE N. 42° 53' 06" W. 122.5 feet to the Westernmost corner of Lot 8, Block H, on the Southerly line of Windsor Drive;

THENCE N. 37° 48' 31" W. across Windsor Drive 80.02 feet to the Southernmost corner of Lot 20, Block J, of this Section;

THENCE N. 42° 59' 11" W. 127.79 feet to the place of beginning, containing in all 11.125 acre of land, including all easements as shown on the official plat of Section Four of Avondale Addition, together with adjacent easements shown on said plat which may be necessary for the installation of utilities in this Section.

The undersigned does hereby further dedicate the streets, as shown on said plat, to the public use forever.

The undersigned owner hereby acknowledges the requirement of the completion of all water distribution and sewage collection systems, and all street, curb and gutter, and drainage improvements, at its expense and guarantees the performance of same.

The undersigned owner further acknowledges that this plat is approved subject to all platting ordinances, rules, regulations, and resolutions of the City of Denton, Denton County, Texas.

The undersigned does further hereby reserve for utility and drainage purposes, the easements, as shown on said plat of said Addition, together with the right of ingress and egress on said easements for the purpose of the erection, construction, repairs and maintenance of such drainage and utility facilities.

IN WITNESS WHEREOF, Builders Development Company has caused its name to be set hereto and its seal to be affixed, the 13th day of September, 1973.

BUILDERS DEVELOPMENT COMPANY

By _____
President

ATTEST:

_____
Assistant Secretary

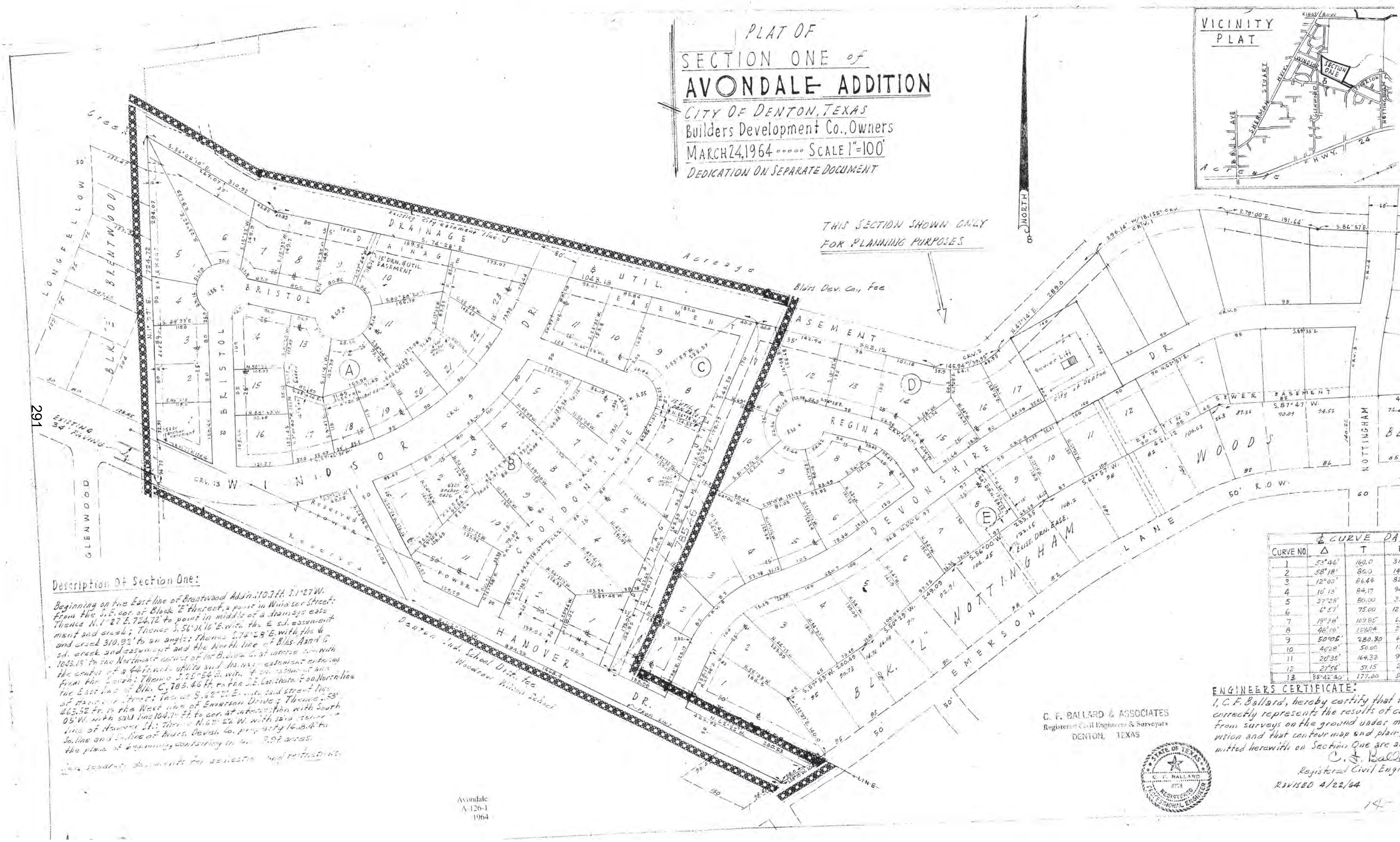
THE STATE OF TEXAS §
§
COUNTY OF DALLAS §

BEFORE ME, the undersigned authority, a Notary Public in and for said County and State, on this day personally appeared J. C. Galbraith, Jr., President of Builders Development Company, known to me to be the person and officer whose name is subscribed to the foregoing instrument, and acknowledged to me that the same was the act of said Builders Development Company, a corporation, and that he executed the same as the act of such corporation for the purposes and consideration therein expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this 13th day of September, 1973.

NOTARY PUBLIC COUNTY OF DALLAS, TEXAS

Marzelle White MARZELLE WHITE
Notary Public in and for Dallas County, Texas.


PLAT OF
SECTION ONE of
AVONDALE ADDITION
CITY OF DENTON, TEXAS
Builders Development Co., Owners
MARCH 24, 1964 SCALE 1"=100'
DEDICATION ON SEPARATE DOCUMENT
VICINITY PLAT
SECTION ONE
NORTH
THIS SECTION SHOWN ONLY FOR PLANNING PURPOSES
Acreage
Blders Dev. Co. Fee
DRAINAGE
UTIL. EASEMENT
BRISTOL
WINDSOR
CROYDON LANE
HANOVER DR.
REGINA
DEVONSHIRE
NOTTINGHAM LANE
EMERSON
WOODS
SEWER EASEMENT
LONGFELLOW
BRENTWOOD
GLENWOOD
EXISTING 34' PAVING
Denton Ind. School Dist. Fee
Woodrow Wilson School
Description Of Section One:
ENGINEERS CERTIFICATE:
C. F. BALLARD & ASSOCIATES
Registered Civil Engineers & Surveyors
DENTON, TEXAS
Registered Civil Engineer
REVISED 4/22/64
Avondale
A-126-1
1964

292

CURVE DATA					
CRV. NO.	Δ	T	R	D	L
13	30°59'10"	65.45	236.11	24.2683	127.60
14	45°58'	57.92	143.48	39.9359	110.09
15	11°38'	80.07	786.00	7.2901	159.58
16	78°22'	50.0	61.34	93.4137	85.89
17	46°02'	55.03	129.54	44.2334	104.07
18	43°58	50.0	123.86	46.2619	95.04
19	17° 30'	30.0	194.92	29.3967	59.53
20	40°05'	425.0	1165.05	4.9182	815.80
21	30°59'10"	65.45	236.11	24.2683	127.68
22 INSIDE	77°01'10"	59.68	75.0	74.400	100.81
23 & 24	16°44'	43.41	295.17	13.4125°	86.20

DEDICATION & RESTRICTIONS FILED SEPARATE.

FINAL PLAT
SECTION TWO OF
AVONDALE ADDITION
CITY OF DENTON, TEX.

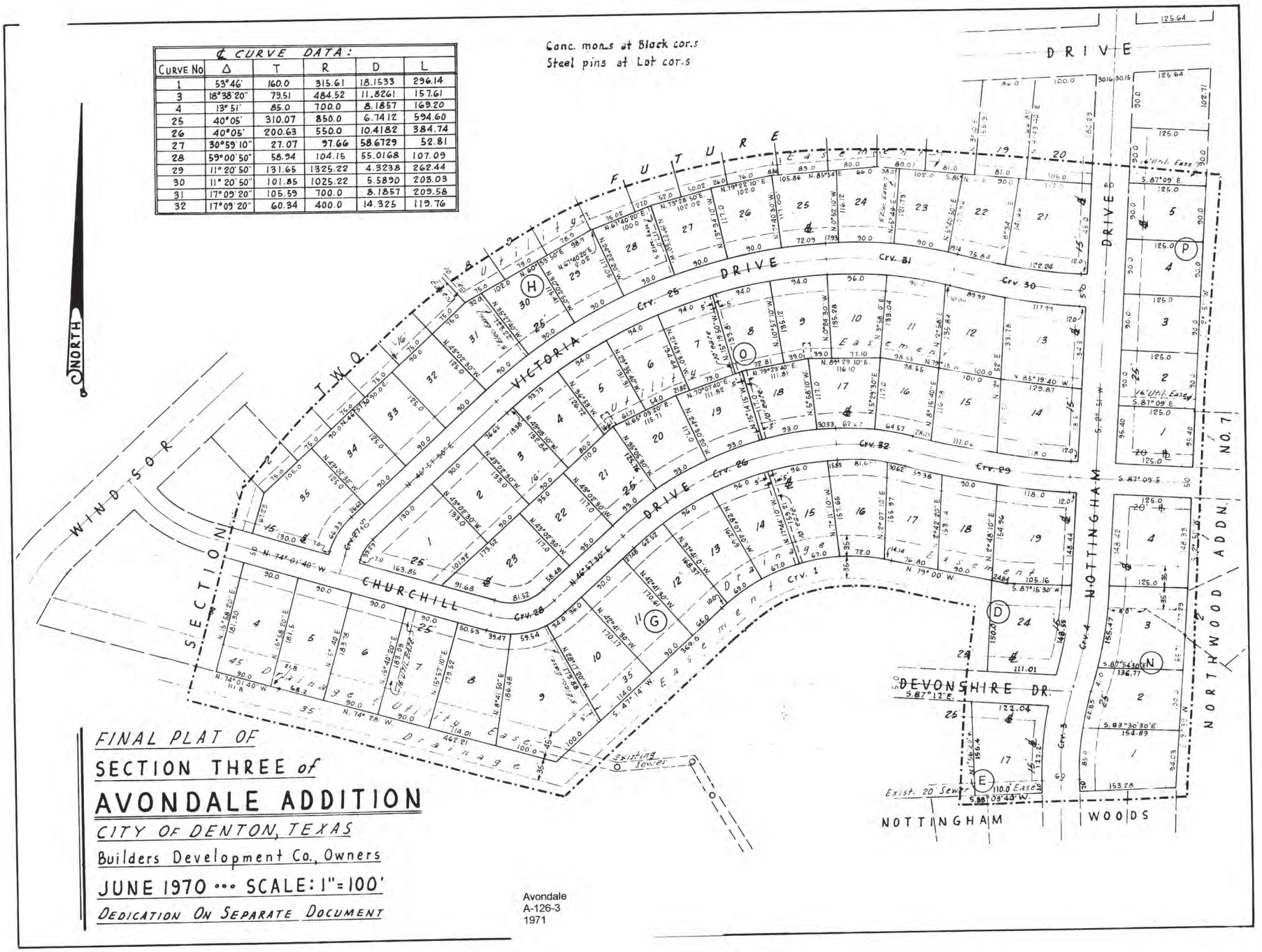
Builders Developement Co. ~ Owners

DEC. 1966 • • • SCALE 1"=100'

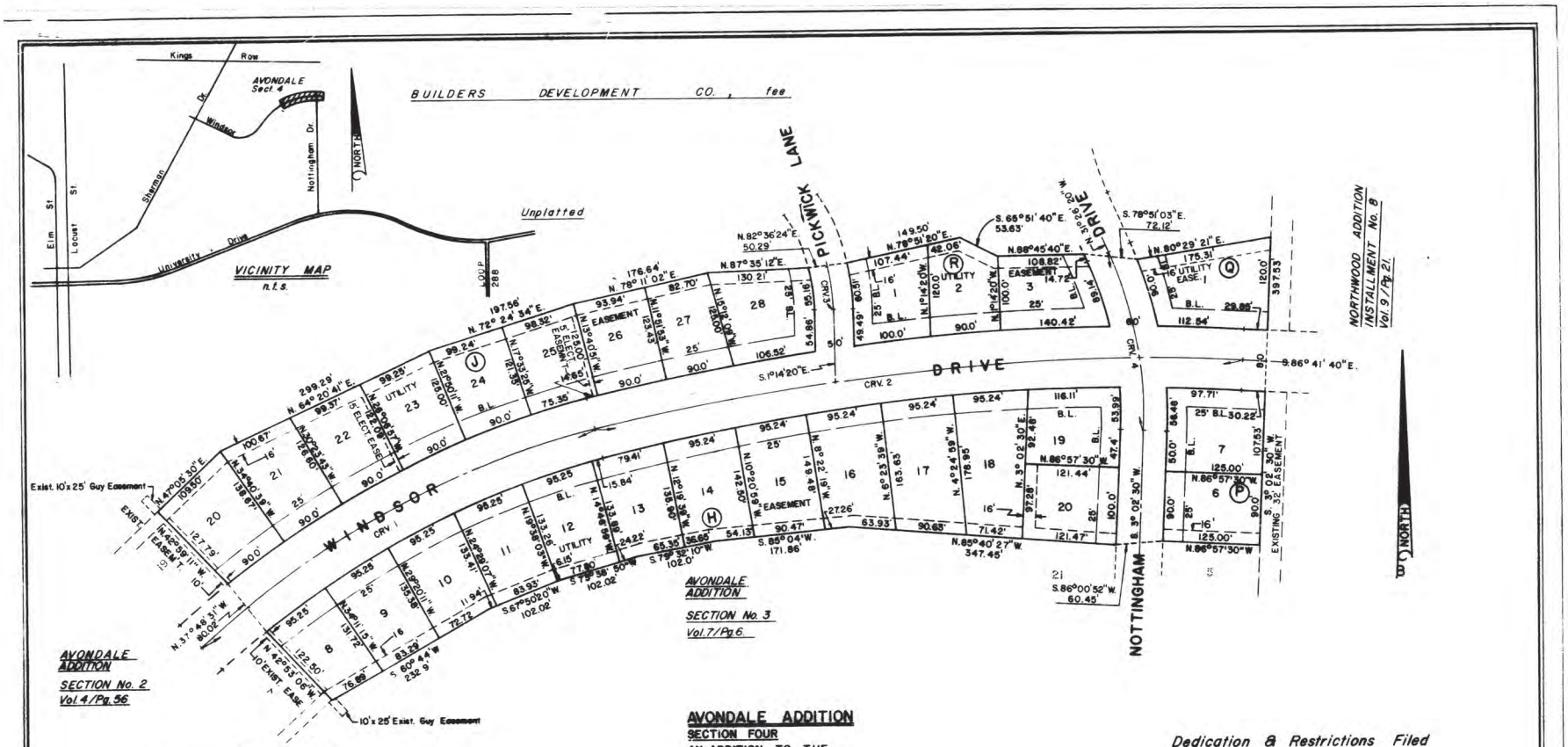
Avondale
A-126-2
1966

A-200

SHEET 1 OF 6



Avondale
A-126-3
1971



CURVE DATA

	INSIDE	℄	OUTSIDE
	CURVE 1		
Δ	25° 03' 44"	28° 52' 55"	24° 58' 50"
R	1124.963	1164.963	1204.963
T	250.039	300.000	266.919
L	492.079	587.240	525.355
	CURVE 2		
Δ	17° 16' 55"	17° 16' 55"	17° 16' 55"
R	2759.180	2799.180	2839.180
T	419.305	425.384	431.462
L	832.242	844.308	856.372
	CURVE 3		
Δ	12° 52' 15"	30° 12' 00"	11° 43' 50"
R	245.550	270.550	295.550
T	27.700	73.000	30.361
L	55.160	142.604	60.510
	CURVE 4		
Δ	26° 30' 00"	26° 30' 00"	23° 54' 31"
R	485.000	515.000	545.000
T	114.202	121.266	115.388
L	224.318	238.193	227.419

AVONDALE ADDITION
SECTION FOUR
AN ADDITION TO THE
CITY OF DENTON, TEXAS
11.125 ACRES IN THE
J. CARTER SURVEY, A-274
DENTON COUNTY, TEXAS
BUILDERS DEVELOPMENT CO., Owner

Dedication & Restrictions Filed Separate.

STATE OF TEXAS — C. F. BALLARD — 1274 — PUBLIC SURVEYOR

STATE OF TEXAS — C. F. BALLARD — 3778 — REGISTERED PROFESSIONAL ENGINEER

C F Ballard

CERTIFICATE OF APPROVAL

Approved this 2nd day of August, A.D. 19 72
by the City Planning Commission of the City of Denton, Texas

Chairman

Secretary

Avondale
A-126-4
1973

PLAT

AVONDALE ADDITION
SECTION FOUR
CITY OF DENTON, TEXAS

C. F. BALLARD & ASSOCIATES
CONSULTING ENGINEERS
DENTON, TEXAS

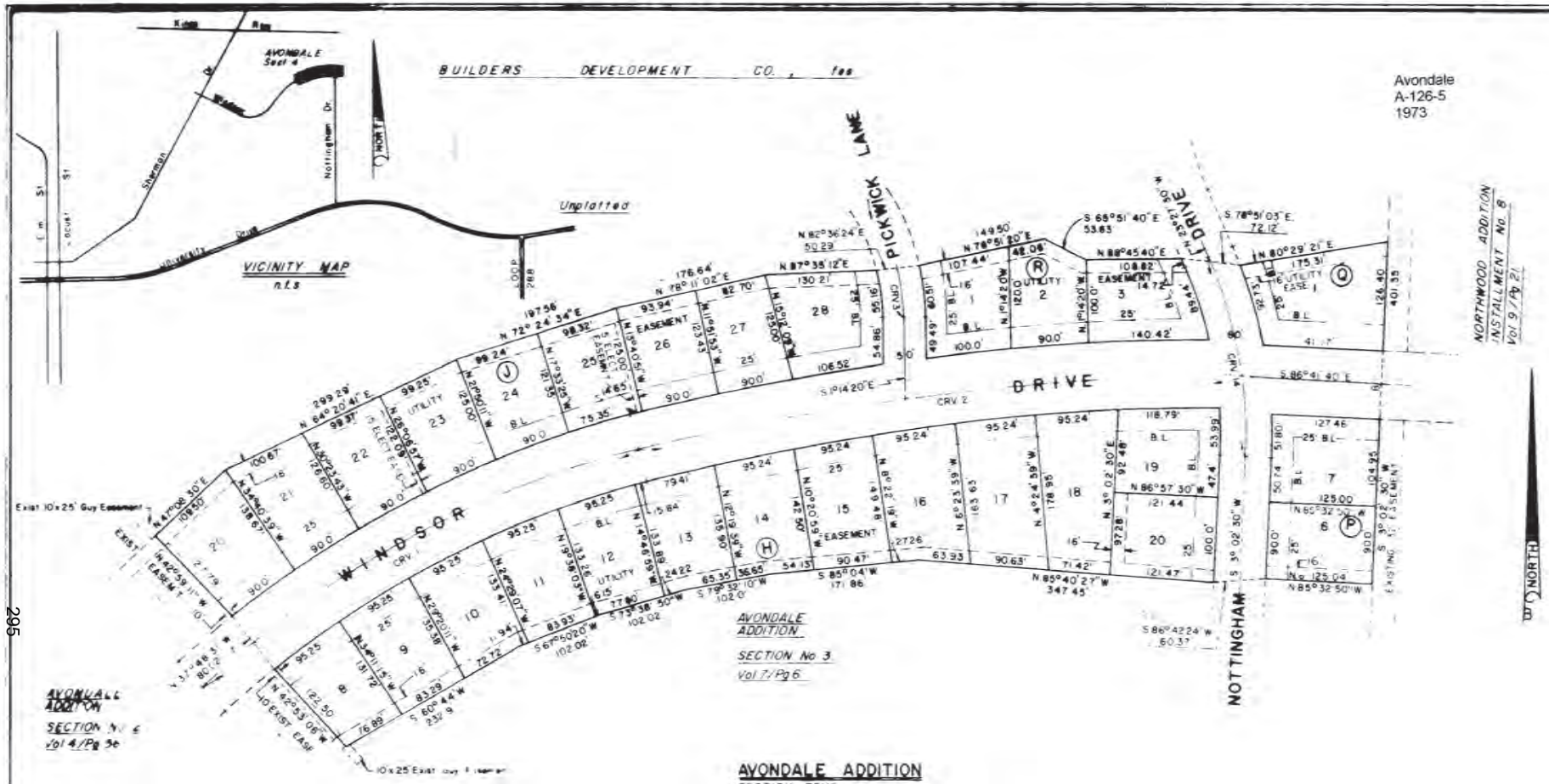
A-126-4

DWN. BY M.K.	JOB NO. 1205	DATE 7-11-1973
APP. BY C.F.B.	SCALE 1" = 100'	FILE NO. 6567

A-126

SHEET 1 OF 4

Avondale
A-126-5
1973



295

PVF DATA

	INSIDE	℄	OUTSIDE
	CURVE 1		
Δ	25° 03 44"	28°52 55"	24°58
R	1124.963	1154.963	[illegible]
T	250.039	300.000	281.04
L	492.079	581.740	5[illegible]355
	CURVE 2		
Δ	14°00 15"	14°32 3[illegible]	15°46 24"
R	2759.180	2799.80	2839.180
T	338.887	357.149	342.[illegible]
L	674.40	71[illegible]	6[illegible]510
	CURVE 3		
Δ	12° 52 15"	50° 12 00	1[illegible]
R	245.550	270.550	295.550
T	27.700	73.000	30.361
L	55.160	142.604	60.510
	CURVE 4		
Δ	26° 30' 00"	26° 30' 00"	23°44 30"
R	485.000	515.000	545.000
T	114.202	121.266	114.56
L	224.318	238.193	225.83

AVONDALE ADDITION

SECTION FOUR
AN ADDITION TO THE
CITY OF DENTON, TEXAS
11.131 ACRES IN THE
J. CARTER SURVEY, A-274
DENTON COUNTY, TEXAS
BUILDERS DEVELOPMENT CO., Owner

Dedication & Restrictions Filed Separate

REVISIONS 12-18-1973
LOT 1, BLK Q
LOT 6, 7, BLK P
CURVE No. 2

APPROVED:

C.F. BALLARD, P.E.

CERTIFICATE OF APPROVAL

Approved this 30 day of January, A.D. 19 74
by the City Planning [illegible] of the City of Denton, Texas

Chairman

Secretary

REVISED PLAT

AVONDALE ADDITION

SECTION FOUR
CITY OF DENTON, TEXAS

C. F. BALLARD & ASSOCIATES
CONSULTING ENGINEERS
DENTON, TEXAS

A-126-5

DWN BY M.K.	JOB NO. 1205	DATE 7-11-1973
APP. BY C.F.B.	SCALE 1" = 100'	FILE NO. 6567

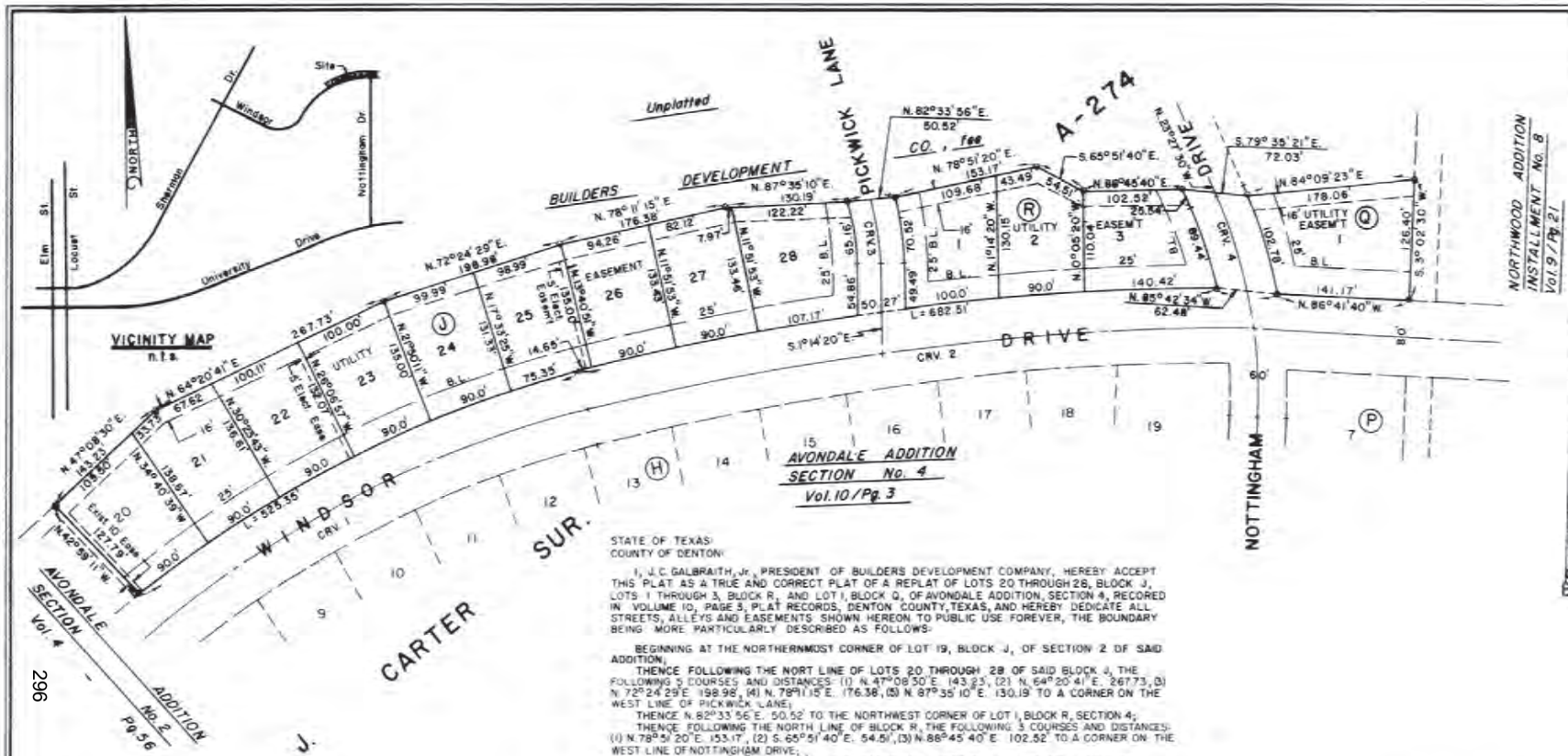
FILED 3-28-74 Vol 10 Pg 41

SHEET 1 OF 4

PLAT TRIM LINE
SEPIA TRIM LINE

A-126

Avondale
A-126-6
1976



CURVE DATA

INSIDE			OUTSIDE
CURVE 1			
Δ			24°58'50"
R			1204.96
T			266.92
L			525.35
CURVE 2			
Δ			13°46'24"
R			2839.18
T			342.91
L			682.51
CURVE 3			
Δ	15°12'20"		13°40'18"
R	245.55		295.55
T	32.78		35.43
L	65.16		70.52
CURVE 4			
Δ	10°33'58"		10°44'19"
R	485.00		545.00
T	44.85		51.54
L	89.44		102.78

STATE OF TEXAS
COUNTY OF DENTON

I, J.C. GALBRAITH, Jr., PRESIDENT OF BUILDERS DEVELOPMENT COMPANY, HEREBY ACCEPT THIS PLAT AS A TRUE AND CORRECT PLAT OF A REPLAT OF LOTS 20 THROUGH 28, BLOCK J, LOTS 1 THROUGH 3, BLOCK R, AND LOT 1, BLOCK Q, OF AVONDALE ADDITION, SECTION 4, RECORED IN VOLUME 10, PAGE 3, PLAT RECORDS, DENTON COUNTY, TEXAS, AND HEREBY DEDICATE ALL STREETS, ALLEYS AND EASEMENTS SHOWN HEREON TO PUBLIC USE FOREVER, THE BOUNDARY BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHERNMOST CORNER OF LOT 19, BLOCK J, OF SECTION 2 OF SAID ADDITION;

THENCE FOLLOWING THE NORT LINE OF LOTS 20 THROUGH 28 OF SAID BLOCK J, THE FOLLOWING 9 COURSES AND DISTANCES: (1) N. 47°08'30"E. 143.23', (2) N. 64°20'41"E. 267.73', (3) N. 72°24'29"E. 198.98', (4) N. 78°11'15"E. 176.38', (5) N. 87°35'10"E. 130.19' TO A CORNER ON THE WEST LINE OF PICKWICK LANE;

THENCE N. 82°33'56"E. 50.52' TO THE NORTHWEST CORNER OF LOT 1, BLOCK R, SECTION 4;

THENCE FOLLOWING THE NORTH LINE OF BLOCK R, THE FOLLOWING 3 COURSES AND DISTANCES: (1) N. 78°51'20"E. 153.17', (2) S. 65°51'40"E. 54.51', (3) N. 88°45'40"E. 102.52' TO A CORNER ON THE WEST LINE OF NOTTINGHAM DRIVE;

THENCE S. 79°35'21"E. 72.03' TO THE NORTHWEST CORNER OF LOT 1, BLOCK Q, SECTION 4;

THENCE N. 84°09'23"E. 178.06' TO THE NORTHEAST CORNER OF LOT 1, BLOCK Q, SECTION 4;

THENCE S. 5°02'30"W. 126.40' TO THE NORTH LINE OF WINDSOR DRIVE;

THENCE N. 86°41'40"W. 141.17';

THENCE N. 85°42'34"W. 62.48' TO THE BEGINNING OF A CURVE TO THE LEFT;

THENCE WITH SAID CURVE, RADIUS=2839.18', LENGTH=682.51' TO THE BEGINNING OF ANOTHER CURVE TO THE LEFT;

THENCE WITH SAID CURVE, RADIUS=1204.96', LENGTH=525.35';

THENCE N. 42°59'11"W. 127.79' TO THE PLACE OF BEGINNING, CONTAINING IN ALL 4.231 ACRES OF LAND.

THIS ____ DAY OF _____, 1976.

_____
J.C. GALBRAITH, Jr.

STATE OF TEXAS
COUNTY OF DENTON

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS DAY APPEARED J.C. GALBRAITH, Jr., KNOW TO ME TO BE THE PERSON WHO SIGNED THE FOREGOING DEDICATION AND ACKNOWLEDGED TO ME THAT HE EXECUTED THE SAME FOR THE USES AND PURPOSE THEREIN EXPRESSED.

GIVEN UNDER MY HAND AND SEAL OF THIS OFFICE THIS THE ____ DAY OF _____, 1976.

_____
NOTARY PUBLIC IN AND FOR
DENTON COUNTY, TEXAS

CERTIFICATE OF APPROVAL

Approved this 7th day of May, A.D. 19 76
by the City Planning Commission of the City of Denton, Texas

Chairman

Secretary

STATE OF TEXAS
COUNTY OF DENTON

I, C.F. BALLARD, REGISTERED PUBLIC SURVEYOR, HEREBY CERTIFY THAT THIS PLAT WAS PREPARED FROM AN ACTUAL AND ACCURATE SURVEY, AND THAT THE CORNER MONUMENTS SHOWN THEREON WERE PLACED UNDER MY PERSONAL SUPERVISION IN ACCORDANCE WITH THE PLATTING RULES AND REGULATIONS OF THE CITY OF DENTON, TEXAS.

C.F. Ballard
C.F. BALLARD

SEAL

REPLAT OF BLOCKS J, R & Q OF SECTION 4 AVONDALE ADDITION CITY OF DENTON, TEXAS

C.F. BALLARD & ASSOC., INC.
CONSULTING ENGINEERS
218 N. AUSTIN DENTON, TEXAS 817-387-0507

A-1266

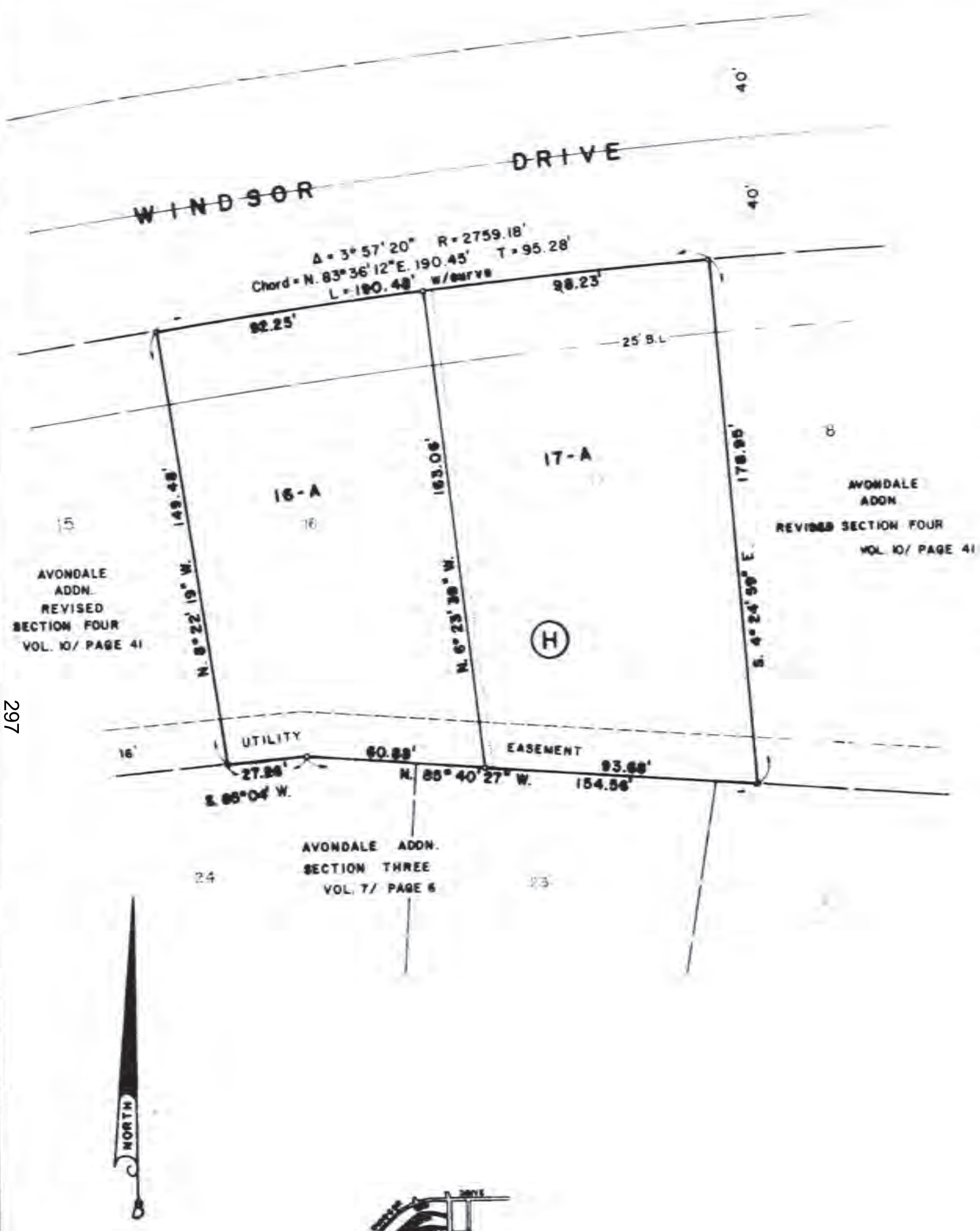
DWN BY M.K.	JOB NO. 1995	DATE 3/5/19
APP BY C.F.B.	SCALE 1" = 100'	FILE NO. 656

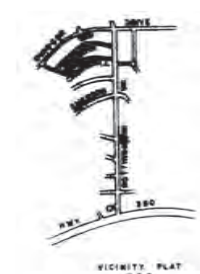
296

PLAT TRIM LINE

FILED 5-6-76 Vol. 12 Pg 48

A-126





VICINITY PLAT N.T.S.

STATE OF TEXAS X
COUNTY OF DENTON X

WHEREAS, Willie R. McCormic, Jr. and wife, Myra J. McCormic and Randy Feucht are the owners of a 0.693 acre tract in the John Carter Survey, Ab. 274, City and County of Denton, Texas, and being all of Lots 16 and 17, Block H, Revised Plat of Section Four of Avondale Addition, recorded in Volume 10, Page 41, Plat Records of Denton County, Texas, and being more particularly described as follows:

All that certain tract or parcel of land situated in and being all of Lots 16 and 17, Block H, Revised Plat of Section Four of Avondale Addition, Recorded in Volume 10, Page 41, Plat Records of Denton County, Texas, and being the same Lot 17, Block H, described in a deed from Troy C. Harris to Willie R. McCormic, Jr. and wife Myra J. McCormic on July 21, 1978, recorded in Volume 902, Page 837, and being the same Lot 16, Block H, described in a deed from Builders Development Corp. to Willie R. McCormic, Jr. and wife Myra J. McCormic on July 1, 1978, recorded in Volume 890, Page 323, Deed Records, part of said Lot 16 being described in a deed from Willie R. McCormic and wife Myra J. McCormic to Randy Feucht on March 12, 1979, recorded in Volume 941, Page 495, deed Records of Denton County, Texas, and being more particularly described as follows:

BEGINNING at an iron pin at the Northeast Corner of Lot 17, Block H, of the Revised Plat of Section Four of Avondale Addition, said point being on the South right-of-way line of Windsor Drive;
THENCE S. 4° 24' 59" E. with the East boundary line of said Lot 17 a distance of 178.95 feet to an iron pin;
THENCE N. 85° 40' 27" W. with the South boundary line of Lots 17 and 16 a distance of 154.56 feet to a steel pin;
THENCE S. 85° 04' W. with the South boundary line of Lot 16 a distance of 27.26 feet to an iron pin;
THENCE N. 8° 22' 19" W. with the West boundary line of said Lot 16 a distance of 149.48 feet to an iron pin in a curve of the South right-of-way of Windsor Drive;
THENCE in a Northeasterly direction with a curve in the South right-of-way of Windsor Drive an arc distance of 190.48 feet (said curve having a central angle of 3° 57' 20", radius of 2759.18 feet, and chord distance and bearing of N. 83° 36' 12" E. 190.45 feet) to the place of beginning and containing in all 0.693 acre (30, 203.07 Sq. ft.) of land.

NOW, THEREFORE, KNOW THESE MEN BY THESE PRESENTS:

THAT, Willie R. McCormic, Myra J. McCormic, and Randy Feucht do hereby adopt this plat designating the herein described property as Lot 16-A and Lot 17-A, a replat of Lots 16 and 17, Block H, Revised Plat of Section Four of Avondale Addition to the City of Denton, Texas, and do hereby dedicate all streets and easements shown hereon to public use forever.

In witness therefore, I have set my hand this 5 day of April A. D., 1979.

Willie R. McCormic, Jr. — Willie R. McCormic, Jr.
Myra J. McCormic — Myra J. McCormic
Randy Feucht — Randy Feucht

STATE OF TEXAS X
COUNTY OF DENTON X

BEFORE ME, the undersigned authority, on this day appeared Willie R. McCormic, Jr., Myra J. McCormic, and Randy Feucht, known to me to be the persons whose names are subscribed to the foregoing instrument and acknowledged to me that they executed the same for the purpose and consideration therein expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE THIS THE 5 DAY OF April A. D., 1979

Alice VanBerssum
NOTARY PUBLIC IN AND FOR DENTON COUNTY, TEXAS

SURVEYOR'S CERTIFICATE

THAT I, Gary W. Hammett, Registered Public Surveyor, do hereby certify that I prepared this plat from an actual and accurate survey of the land and that the iron pins shown thereon were placed under my personal supervision in accordance with ordinances of the CITY OF DENTON, TEXAS.

Gary W. Hammett
GARY W. HAMMETT, REGISTERED PUBLIC SURVEYOR #1849

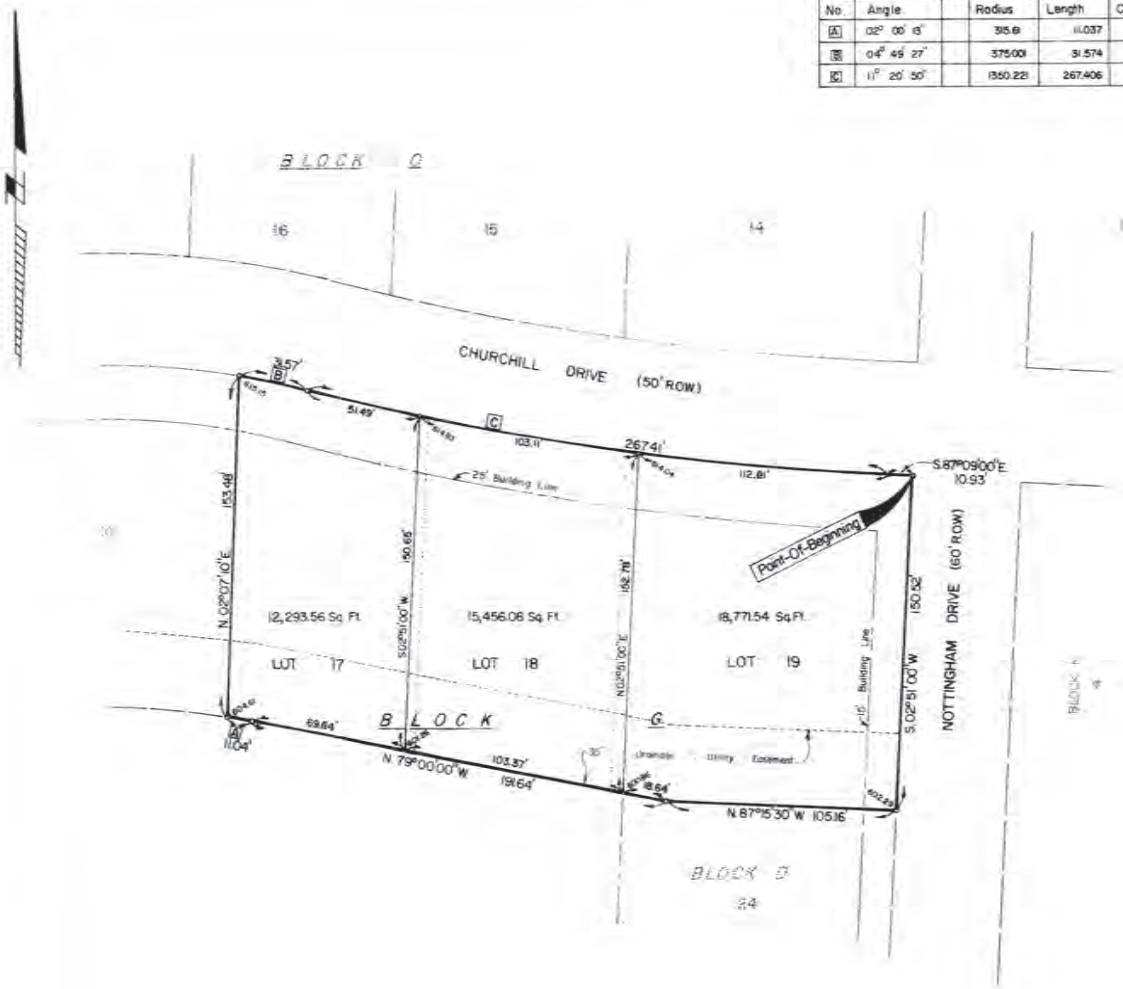
Approved by the City: 4 April 79
Linnie McAdams
Brooks Holt

Avondale
A-126-7
1979

REPLAT OF LOTS 16 & 17, BLOCK H OF REVISED SECTION FOUR AVONDALE ADDITION CITY OF DENTON, TEXAS	
C.F. BALLARD & ASSOCIATES, INC. ENGINEERS & SURVEYORS 218 N. AUSTIN ST. DENTON, TEXAS 817-387-0508	A-126-7
DRAWN BY JAT	JOB NO. 5361	DATE 3/23/1979
APP. BY	SCALE 1" = 30'	FILE NO. 6567

Film # 4-11-79 Cab. B Drw. 81 A-126

CURVE DATA					
No.	Angle	Radius	Length	Chord	Tangent
A	02° 00' 15"	315.61	11.037	11.036	5.519
B	04° 49' 27"	375.00	31.574	31.565	15.796
C	11° 20' 50"	1350.22	267.406	266.970	134.142



298

VICINITY MAP
No Scale

Avondale
A-126-8
1985

OWNER: L & L CONSTRUCTION
P.O. BOX 1943
DENTON, TEXAS 76201

GRAPHIC SCALE

STATE OF TEXAS XX
COUNTY OF DENTON XX

WHEREAS, WE, L & L CONSTRUCTION ARE THE OWNERS OF A 1.0680 ACRE TRACT IN THE W. POGUE SURVEY, ABSTRACT 1017, CITY OF DENTON AND COUNTY OF DENTON, TEXAS, BEING ALL OF LOTS 17, 18, & 19, BLOCK G, OF THE AVONDALE ADDITION IN THE CITY OF DENTON, TEXAS, AS SHOWN BY THE PLAT RECORDED IN VOLUME 7, PAGE 6, PLAT RECORDS OF DENTON COUNTY, TEXAS, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHEAST CORNER OF SAID LOT 19, BLOCK G, AT AN IRON PIN IN THE WEST RIGHT-OF-WAY OF NOTTINGHAM DRIVE AND THE SOUTH RIGHT-OF-WAY OF CHURCHILL DRIVE;

THENCE SOUTH 02 DEGREES 51 MINUTES 00 SECONDS WEST ALONG THE WEST RIGHT-OF-WAY OF SAID NOTTINGHAM DRIVE A DISTANCE OF 150.52 FEET TO AN IRON PIN;

THENCE NORTH 87 DEGREES 15 MINUTES 30 SECONDS WEST A DISTANCE OF 105.16 FEET TO AN IRON PIN;

THENCE NORTH 79 DEGREES 00 MINUTES 00 SECONDS WEST A DISTANCE OF 191.64 FEET TO AN IRON PIN;

THENCE WITH A CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 02 DEGREES 00 MINUTES 15 SECONDS, A RADIUS OF 315.61 FEET, A CHORD OF NORTH 80 DEGREES 00 MINUTES 06 SECONDS WEST, 11.04 FEET, AN ARC LENGTH OF 11.04 FEET TO AN IRON PIN;

THENCE NORTH 02 DEGREES 07 MINUTES 10 SECONDS EAST A DISTANCE OF 153.48 FEET TO AN IRON PIN IN THE SOUTH RIGHT-OF-WAY OF CHURCHILL DRIVE;

THENCE WITH A CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 04 DEGREES 49 MINUTES 27 SECONDS, A RADIUS OF 375.00 FEET, A CHORD OF SOUTH 78 DEGREES 12 MINUTES 54 SECONDS EAST, 31.56 FEET, AN ARC LENGTH OF 31.57 FEET TO AN IRON PIN;

THENCE WITH A CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 11 DEGREES 20 MINUTES 50 SECONDS, A RADIUS OF 1350.22 FEET, A CHORD OF SOUTH 81 DEGREES 28 MINUTES 35 SECONDS EAST, 266.97 FEET, AN ARC LENGTH OF 267.41 FEET TO AN IRON PIN;

THENCE SOUTH 87 DEGREES 09 MINUTES 00 SECONDS EAST A DISTANCE OF 10.93 FEET TO THE POINT-OF-BEGINNING AND CONTAINING 1.0680 ACRES OF LAND.

NOW THEREFORE KNOW THESE MEN BY THESE PRESENTS:

THAT, WE, L & L CONSTRUCTION, DO HEREBY ADOPT THIS REPLAT, DESIGNATING THE HEREIN DESCRIBED PROPERTY AS LOTS 17, 18, & 19, BLOCK G, OF THE AVONDALE ADDITION TO THE CITY OF DENTON, TEXAS, AND DO HEREBY DEDICATE TO THE PUBLIC USE FOREVER, THE STREETS AND EASEMENTS SHOWN HEREON.

STATE OF TEXAS XX
COUNTY OF DENTON XX

BEFORE ME, THE UNDERSIGNED NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE ON THIS DAY PERSONALLY APPEARED JIM LYNCH, PRESIDENT OF L & L CONSTRUCTION, A CORPORATION, AND ACKNOWLEDGED TO ME THAT HE EXECUTED THE SAME FOR THE PURPOSE AND CONSIDERATIONS THEREIN EXPRESSED AND IN THE CAPACITY THEREIN STATED;

GIVEN UNDER MY HAND AND SEAL OF OFFICE THIS ____ DAY OF _____, 19__.

NOTARY PUBLIC IN AND FOR DENTON COUNTY.

SURVEYOR'S CERTIFICATE

KNOW THESE MEN BY THESE PRESENTS:

THAT, I, GARY W. HAMMETT, REGISTERED PUBLIC SURVEYOR, DO HEREBY CERTIFY THAT I PREPARED THIS PLAT FROM AN ACTUAL AND ACCURATE SURVEY OF THE LAND, AND THAT THE IRON PINS SHOWN THEREON WERE PLACED UNDER MY PERSONAL SUPERVISION IN ACCORDANCE WITH THE ORDINANCES OF THE CITY OF DENTON, DENTON COUNTY, TEXAS.

GARY W. HAMMETT, R. P. S. #1849

CERTIFICATE OF APPROVAL

Approved this ____ day of _____, A.D. 19__
by the Planning and Zoning Commission of the City of Denton, Texas.

Bill Cochran, Chairman

Charlotte Allen, Secretary

		DWN JB	Scale 1"=40'	HAMMETT & NASH, INC. CONSULTING ENGINEERS & SURVEYORS DENTON, TEXAS 76201 P.O.B. 1552	REPLAT OF LOTS 17,18 & 19, BLOCK G, AVONDALE ADDITION, SECTION THREE, AN ADDITION TO THE CITY OF DENTON, per PLAT FILED IN VOL. 7, PAGE 6, PLAT RECORDS of DENTON COUNTY, TEXAS	SHEET OF 1 / 1
12-9-84	LOT DIMENSIONS	JB	CKD	Date 12-10-84		JOB NO 21,389
DATE	REVISIONS	BY				

Revised 5-2-85

A-126-8

H. CARTER #28
DRAINAGE

6153

887

THE STATE OF TEXAS :
KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF DENTON :

THAT WE, Nette Shultz, Susie Beyette and Callie R. Ratliff, each being a feme sole, of Denton County, Texas, for and in consideration of the sum of One Dollar ($1.00) cash to us in hand paid and the benefits that will accrue to our property, the receipt of which is hereby acknowledged, do hereby GIVE AND GRANT unto the said City of Denton, Texas, a Municipal Corporation, the right to dig a drainage ditch and perpetually maintain an open drainage ditch in, upon and across the following described tract of land, being more particularly described as follows, to-wit:

All that certain lot, tract or parcel of land lying and being situated in the County of Denton, State of Texas, being out of the Hardin Carter Survey, Abstract No. 281, and being more particularly described as follows:

BEGINNING at a point in the most Southerly North line of a certain 279.83 acre tract of land conveyed by Laura E. Poe to Nette Shultz, that is South 86°50' West of an inner Ell corner of said 279.83 acre tract, said point also being the Southwest corner of Lot No. 1, in Block No. 7 of Norchester Subdivision;

THENCE South 8 deg. 40 min. East from said beginning point, 195.9 feet for a point for a corner;

THENCE South 81 deg. 20 min. West 25 feet for a point for a corner;

THENCE North 8 deg. 40 min. West 199.5 feet for a point for a corner;

THENCE North 86 deg. 50 min. East 25.50 feet to the place of beginning.

The easement herein granted being a strip of land 25 feet wide.

TO HAVE AND TO HOLD the same perpetually to the City of Denton, Texas, its successors and assigns, and to its agents, officers and employees, together with the right and privilege at any and all times to enter said premises for the purpose of digging and maintaining said drainage ditch.

WITNESS OUR HANDS at Denton, Texas, this 25th day of November A.D., 1957.

Nette Shultz
Nette Shultz

Susie Beyette
Susie Beyette

Callie R. Ratliff
Callie R. Ratliff

APPENDIX 2

ASSESSMENT OF NON-FEDERAL SPONSOR'S REAL ESTATE ACQUISITION CAPABILITY COOPER CREEK SECTION 205 PROJECT

NON-FEDERAL SPONSOR: CITY OF DENTON, TEXAS

I. Legal Authority:

a. Does the sponsor have legal authority to acquire and hold title to real property for project purposes?
Yes

b. Does the sponsor have the power of eminent domain for this project?
yes

c. Does the sponsor have "quick-take" authority for this project?
There is no "quick-take" authority under Texas law, however, possession of property can be obtained without undue delay.

d. Are any of the lands/interests in land required for the project located outside the sponsor's political boundary?
No. everything in city limits

e. Are any of the lands/interests in land required for the project owned by an entity whose property the sponsor cannot condemn?
Two roads identified as potentially within the project area (Sherman Dr. And Locust Dr.) are both owned by TxDOT.

II. Human Resource Requirements:

a. Will the sponsor's in-house staff require training to become familiar with the real estate requirements of Federal projects including the Uniform Act?

No.

b. If the answer to II.a. is "yes," has a reasonable plan been developed to provide such training?
-will hire consultant
c. Does the sponsor's in-house staff have sufficient real estate acquisition experience to meet its responsibilities for the project?
yes
d. Is the sponsor's projected in-house staffing level sufficient considering its other work load, if any, and the project schedule?

e. Can the sponsor obtain contractor support, if required in a timely fashion?
-Planning to utilize contractor support for relocations

f. Will the sponsor likely request USACE assistance in acquiring real estate?
-No, not likely.

III. Other Project Variables:

a. Will the sponsor's staff be located within reasonable proximity to the project site?
-yes, all lands are within the City limits of Denton.

b. Has the sponsor approved the project/real estate schedule/milestones?
-Full schedule was not prepared. City officials provided typical periods of performance for RE acquisition tasks. 30-60 days for survey/appraisal/title, 3-4 months to acquire from offer to closing, condemnation typically requires 1.5-2 years.

IV. Overall Assessment:

a. Has the sponsor performed satisfactorily on other USACE projects?
The City was the NFS on a previous section 205 planning report from the 80's as well as ongoing coordination with USACE at Lewisville Lake.

b. With regard to this project, the sponsor is anticipated to be:
Capable

V. Coordination:

a. Has this assessment been coordinated with the sponsor?
- yes, assessment was performed via teleconference on Thursday, 26 September 2024.

b. Does the sponsor concur with this assessment?

Concur.

1. TITLE PAGE

REAL ESTATE COST STUDY

COOPER CREEK SECTION 205
FLOOD DAMAGE REDUCTION PROJECT
DENTON (DENTON COUNTY) TEXAS

CONTINUING AUTHORITIES PROGRAM
NON-FEDERAL SPONSOR – CITY OF DENTON

Prepared for:
U.S. Army Corps of Engineers
Fort Worth District
Programs and Project Planning Division

Prepared By:
Clay Miller, Review Appraiser
U.S. Army Corps of Engineers
Fort Worth District
Real Estate Division

Effective Date: November 6, 2024
Date of Report: November 6, 2024

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3. SUMMARY

As requested by the client, the estimated project real estate cost was developed for each of the following three (3) alternatives.

1. Alternative 2A1 – Channel Improvement Easement on City Owned Tract PID 34607
   - 0.82 acres $24,590

2. Alternative 2C1/2D1 – Fee Simple acquisition of Privately Owned Tract PID 39529
   - 15.14 acres $484,715

3. Alternative 8A1 – Channel Improvement Easement on 21 Privately Owned Tracts in Avondale Subdivision
   - 1.837 acres $439,200

Damages/Severance		
Scenario 1		$0
Scenario 2		$0
Scenario 3		$0
Minerals		
Scenario 1		$0
Scenario 2		$0
Scenario 3		$0
Relocation (PL 91-646)		
Scenario 1		$0
Scenario 2		$0
Scenario 3		$0
Other Costs		
Scenario 1	$24,590 X 20% =	$4,918
Scenario 2	$484,715 X 20% =	$96,943
Scenario 3	$439,200 X 20% =	$87,840

Total Estimate by Scenario:

Scenario 1		**$29,508**
Land value	$24,590	
Damages/Severances	$0	
Minerals	$0	
Relocation	$0	
Other Costs	$4,918	
Scenario 2		**$581,658**
Land value	$484,715	
Damages/Severances	$0	
Minerals	$0	
Relocation	$0	
Other Costs	$96,943	
Scenario 3		**$527,040**
Land value	$439,200	
Damages/Severances	$0	
Minerals	$0	
Relocation	$0	
Other Costs	$87,840	

4. PURPOSE OF COST ESTIMATE

The purpose of this cost estimate is to develop for internal pre-planning purposes and project feasibility purposes, an estimate of market value for each of the following three (3) scenarios:

1. Alternative 2A1 – Channel Improvement Easement on City Owned Tract Out of PID 34607 – 0.82 acres.
2. Alternative 2C1/2D1 – Fee Simple acquisition of Privately Owned Tract PID 39529 – 15.14 acres.
3. Alternative 8A1 – Channel Improvement Easement on 21 Privately Owned Tracts in Avondale Subdivision – 80,000 square feet or 1.84 acres.

Project aerial maps are attached.

The Continuing Authorities Program (CAP) and Section 205 of the Flood Control Act of 1948, as amended, authorizes the U.S. Army Corps of Engineers to participate in the development and implementation of structural and non-structural flood damage reduction projects.

5. INTENDED USE OF COST ESTMATE/ INTENDED USER

The values generated for each of the three (3) scenarios will be used by the intended user (authorized personnel of the U.S. Corps of Engineers) for planning, development of a project budget, and internal decision making.

6. PROJECT SUMMARY

A Project Management Plan (PMP) was not provided to the individual providing this cost estimate. The principal objective of the project is flood damage reduction in the urbanized Cooper Creek basin.

Alternative 2A1 is a 0.82-acre detention basin on city owned land. Alternative 2C1/2D1 is a detention basin on a 15.14-acre tract that are currently privately owned. Alternative 8A1 is a 1.84-acre (1,000’ x 80’) channelization improvement easement that would travel across a pre-existing drainage easement situated at the rear of 21 privately owned single family lots that are situated along the current course of Cooper Creek.

7. ESTATES OR PROPERTY RIGHTS

The property rights analyzed are fee simple and channel improvement easement.

8. SCOPE OF THE COST ESTIMATE

This cost estimate is a pre-planning level estimate of the market value (fee simple or easement) of properties identified as being necessary for the successful completion of the project, taken "in gross", for the purposes for planning, development of a project budget, and internal decision making. This real estate cost study was requested by the Programs and Project Management Division of the Fort Worth District, U.S. Army Corps of Engineers.

This cost study is not considered to be a USPAP compliant appraisal report. The person preparing this cost estimate is familiar with the area but did not visit the subject project for the purpose of preparing this estimate. A detailed highest and best use analysis was not completed. Zoning was confirmed to provide a basis for highest and best use and Denton Central Appraisal District (DCAD) records were researched to provide a basis for real estate cost data. Individual market sales transactions were not researched or relied upon for this estimate. The format and contents of this report are styled in conformity with guidance received from USACE. A gross appraisal compliant with ER 405-1-04 and reviewed and accepted for use by a Government Review Appraiser will be required to proceed with the project.

9. DEFINITIONS

Fee Simple: ER 405-1-11 defines fee simple as:

> *"The fee simple title to the land described, subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines."*

Easement: The Dictionary of Real Estate Appraisal, Seventh Edition, Appraisal Institute, Chicago, Illinois, 2022 defines an easement as:

> *"The right to use another's land for a stated purpose."*

Channel Improvement Easement: ER 405-1-11 defines a channel improvement easement as:

> *A perpetual and assignable right and easement to construct, operate, and maintain channel improvement works on, over and across (the land described in Schedule A) (Tracts Nos. _____, _____ and _____) for the purposes as authorized by the Act of Congress approved_____, including the right to clear, cut, fell, remove and dispose of any and all timber, trees, underbrush, buildings, improvements and/or other obstructions therefrom; to excavate, dredge, cut away, and remove any or all of said land and to place thereon dredge or spoil material; and for such other purposes as may be required in connection with said work of improvement; reserving, however, to the owners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements far public roads and highways, public utilities, railroads and pipelines.*

Market Value: The Uniform Appraisal Standards for Federal Land Acquisition, The Appraisal Foundation, 2016 Edition, Section 1, Paragraph 1.2.4, Page 10, defines market value as:

> *"Market value is the amount in cash, or on terms reasonably equivalent to cash, for which in all probability the property would have sold on the effective date of value, after a reasonable exposure time on the open competitive market, from a willing and reasonably knowledgeable seller to a willing and reasonably knowledgeable buyer, with neither acting under any compulsion to buy or sell, giving due consideration to all available economic uses of the property."*

Neighborhood: The Dictionary of Real Estate Appraisal, Seventh Edition, Appraisal Institute, Chicago, Illinois, 2022 defines a neighborhood as:

1. *A group of complementary land uses; a congruous grouping of inhabitants, buildings, and business enterprises.*
2. *A developed residential superpad within a master planned community usually having a distinguishing name and entrance.*
3. *A geographic area around a property that influences that property, i.e. its environment.*

Highest and Best Use: The Uniform Appraisal Standards for Federal Land Acquisition, The Appraisal Foundation, 2016 Edition, Section 4, Paragraph 4.3.1, Page 102, defines highest and best use as:

> *"The highest and most profitable use for which the property is adaptable and needed or likely to be needed in the reasonably near future."*

10. LIMITING CONDITIONS AND ASSUMPTIONS

This real estate cost estimate is subject to the following assumptions and limiting conditions.

- The estimator assumes no responsibility for matters legal in character nor do I render any opinion as to the title, which is assumed to be good. All existing liens and encumbrances have been disregarded, and the property is appraised as though free and clear under responsible and competent management.
- The estimator made no survey of the property and assumes no responsibility in connection with such matters.
- The estimator believes to be reliable the information identified in this report as furnished by others but assumes no responsibility for its accuracy.
- Possession of the report, or copy thereof, does not carry with it the right of publication, nor may it be reproduced in whole or in part, in any manner, by any person, without the prior written consent of the author. Neither all nor any part of the contents of the report shall be conveyed to the public through advertising, public relations, news, sales, or other media without the prior written consent of the author, particularly as to value conclusions, the identity of the appraiser, or the Governmental body with which the estimator is connected.

- The estimator is not required to give testimony or attendance in court by reason of this cost estimate, with reference to the property in question, unless arrangements have been previously made, therefore.
- The distribution of the total valuation in this report between land and improvements applies only under the existing program of utilization. The separate valuations for land and building must not be used in conjunction with any other estimate and are invalid if so used.
- Unless otherwise stated in this report, the existence of hazardous material used in the construction, such as the presence of urea-formaldehyde foam insulation, asbestos, the existence of radon gas, which may or may not be present on the property, and/or underground petroleum storage tanks, was not observed by the estimator. The estimator has no knowledge of the existence of such materials on or in the property and is not qualified to detect such substances. The existence of any such hazardous construction materials or potentially hazardous waste material may have an effect on the value of the property. If such is present, the value of the property may be adversely affected.
- The Americans with Disabilities Act (ADA) became effective January 26, 1992. The estimator has not made a specific compliance survey and analysis of this property to determine whether or not it is in conformity with the various detailed requirements of the ADA. It is possible that a compliance survey of the property is not in compliance with one or more of the requirements of the act. If so, this fact could have a negative effect upon the value of the property. Since the estimator has no direct evidence relating to this issue, I did not consider possible noncompliance with the requirements of ADA in estimating the value of the property.
- This report is prepared solely for the internal use of authorized personnel of USACE, by the estimator in consideration of payment of a sum of money in the form of salary paid by USACE and would not be prepared in the absence of such consideration. This report is prepared solely for USACE and may not be relied upon by any other person, entity, or organization for any other purpose whatsoever.
- In accordance with ER 405-1-04 (dated 29-Jan-2016), 4-2, c. Exemptions from USPAP and UASFLA, several USACE valuation assignments require quick and sometime superficial estates of value, primarily for internal planning purposes and are not under the purview of 49 C.F.R. Part 24 for acquisition appraisals. USACE valuation assignments that fall within this exemption category include preliminary estimates of value, **cost estimates**, feasibility reports, gross appraisals, and informal value estimates.

11. EXISTING EASEMENTS OR INTERESTS

The properties currently identified on the project aerial maps and publicly and privately owned. Although not identified at the current level of design, it is anticipated that easements for power lines, roads, utilities, pipelines, and/or drainage may exist. An Attorney's Opinion of Compensability would be necessary from the USACE Office of Counsel to address any utilities that are impacted.

12. AREA, CITY, AND NEIGHBORHOOD DATA

The City of Denton is the county seat of Denton County and located in north Texas, approximately 30 miles north of both Dallas and Fort Worth. It is included in the Dallas-Fort Worth-Arlington Metropolitan Statistical Area (MSA). The city is located on IH-35 which traverses the United States from Mexico to Canada. The 2020 U.S. Census indicates that Denton had a population of 139,869. This is a 23.4% increase over the 2010 Census population of 113,383.

Denton is a home-rule city with a council-manager form of government. Residents elect a mayor, four single-member district council members, and two at-large members. The Denton City Council appoints the city manager. Council terms are for two years, with a maximum of three consecutive terms, and elections are held each year in May. The city is served by police, fire, Denton Municipal Electric (owned by the city), water, wastewater and sanitary treatment facilities, natural gas (Oncor), and telephone. K-12 education is provided by Denton ISD. The University of North Texas and Texas Women's University are also located in Denton.

13. PROPERTY DATA

The subject property is located in the City of Denton, Texas and in general, follows the course of Cooper Creek. The larger neighborhood impacted by the project is generally described as being bounded by Loop 288 to the north and the east, U.S. Highway 380 (University Drive) to the south, and U.S. Highway 77 (N Elm Street) to the west.

Site:

Alternative 2A1 is a proposed 0.82 are detention pond located on Tax Parcel 34607, which is owned by the City of Denton and currently used as a public park. Parcel 34607 currently has PF (Public Facilities) zoning per City of Denton Development Services.

- Parcel 34607 is described as A0274A J. CARTER, TR 22, 6.07 ACRES, OLD DCAD TR 1A

Alternative 2C1/2D1 is a detention pond on a 15.14-acre tract, Tax Parcel 39529, which is privately owned. This tract is currently vacant and is zoned PD with an R-7 residential overlay per City of Denton Development Services.

- Parcel 39529 is described as A0186A BBB & CRR, TR 23,26, 15.1395 ACRES

Alternative 8A1 is a 1.84-acre (1,000' x 80') channelization improvement easement that would travel across a pre-existing drainage easement situated at the rear of 21 privately-owned single-family lots that are situated along the current course of Cooper Creek. These lots are part of the Avondale subdivision and most of the lots are currently improved with single family dwellings.

The area sought for the project is not improved as it is assumed to encompass the areas of the lots located in the pre-existing drainage easement. Lots impacted are as follows:

- Lots 7 thru 10 and Lot 23, Block A, Avondale 1, City of Denton, Denton County, Texas
- Lots 8 thru 11, Block C, Avondale 1, City of Denton, Denton County, Texas
- Lots 5 thru 12, Block F, Avondale 2, City of Denton, Denton County, Texas
- Lots 1 thru 3, Block G, Avondale 2, City of Denton, Denton County, Texas
- Lots 4 and 5, Block G, Avondale 3, City of Denton, Denton County, Texas

Improvements: Based on a review of aerial photographs, the different land areas required for the project are currently vacant.

Ownership Data:

Alternative 2A1, Parcel 34607 is owned by the City of Denton.

Alternative 2C1/2D1 Parcel 39529 is owned by Trans-Atlas Financial Inc.

Alternative 8A1 is owned by multiple private owners.

Environmental/Historical Issues: An ESA has not been provided to the individual preparing this cost estimate.

14. HIGHEST AND BEST USE:

For Alternative 2A1, the highest and best use is continued use as a public park.

For Alternative 2C1/2D1, the highest and best use is residential development.

For Alternative 8A1, the highest and best use is single family residential use.

15. CONSIDERATION OF FEDERAL AND STATE RULES

The NFS (City of Denton) will acquire the property under State rules. Texas rules of valuation differ from Federal rules primarily in that state rules do not allow enhancements to offset the value of the part taken. In the state rule, such benefits may offset damages only. This real estate cost estimate has been prepared under this assumption.

16. VALUATION PROCESS

Normally, a discussion of the 3 approaches to value (cost, income, and sales) are included and reconciliation results is 1 or all approaches being identified as applicable. Given that the properties are vacant, cost and income approaches are not applicable.

For this cost estimate, the client requested the development of market value estimate for each of the following three (3) scenarios:

- Alternative 1 – what is the estimated value of a channelization improvement easement to be located on 0.82 acres of public owned land in Tax Parcel 34607
- Alternative 2 – what is the estimated value of a fee simple acquisition of 15.14 acres of privately owned land (Tax Parcel 39529)
- Alternative 3 – what is the estimated value of a 1,000' x 80' (80,000 sf or 1.84 acres) channelization improvement easement to be located out of 21 tax parcels with a pre-existing drainage easement in the Avondale subdivision.

Consistency is needed in order to address this request. As such, 2024 assessed land values from the Denton Central Appraisal District records will be used.

The use of tax records in the development of a cost estimate is allowed in ER 405-1-04, Paragraph 4-21 Gross Appraisal (a)(1) which states:

> *"Gross appraisals shall be as complete and descriptive as possible, but there is no requirement for owner contact, and the appraiser may rely on tax records, cursory inspections, or other suitable information for descriptions of improvements, as detailed inspections may not be practical."*

Alternative 2A1:

This scenario requires a 0.82-acre channelization improvement easement of a 6.07-acre tract owed by the City of Denton. The 2024 DCAD assessed land value is $202,248 for 6.07 acres, or $33,319 per acre. In this estimator's opinion the limitations placed on the use of the property by a perpetual channelization improvement easement will restrict 90% of the usability. Therefore, for Alternative 2A1, the channelization easement has been valued at 90% of the assessed unit value of the property.

0.82 Acres X $33,319/Acre X 90% = $24,589.42
Say $24,590®

Alternative 2C1/2D1:

This scenario requires the fee simple acquisition of a 15.14-acre property that is privately owned. The subject property is identified as DCAD Tax Parcel 39529. The 2024 DCAD assessed land value is $484,715 for 15.14 acres, or $32,016 per acre. Therefore, for Alternative 2C1/2D1, the total fee acquisition has been valued at 1000% of the assessed value of the property.

$484,715

Alternative 8A1:

This scenario requires an 80,000 square foot of 1.84-acre channelization improvement easement of 21 privately-owned single-family parcels in the Avondale subdivision. The 2024 DCAD assessed land values for the 21 parcels have bene summarized in the chart below.

Parcel	Legal	Lot Size (SF)	Land	Imps	Total	Land $/SF
23403	AVONDALE 1 BLK A LOT 7	12,516	$93,446	$256,554	$350,000	$7.47
23414	AVONDALE 1 BLK A LOT 8	12,000	$92,434	$315,670	$408,104	$7.70
23417	AVONDALE 1 BLK A LOT 9	13,385	$95,152	$171,514	$266,666	$7.11
23431	AVONDALE 1 BLK A LOT 10	16,195	$100,666	$227,334	$328,000	$6.22
23454	AVONDALE 1 BLK A LOT 23	18,782	$105,743	$147,315	$253,058	$5.63
23485	AVONDALE 1 BLK C LOT 11	14,700	$97,733	$225,261	$322,994	$6.65
23488	AVONDALE 1 BLK C LOT 10	13,600	$95,574	$235,811	$331,385	$7.03
23070	AVONDALE 1 BLK C LOT 9	20,790	$109,684	$205,396	$315,080	$5.28
23083	AVONDALE 1 BLK C LOT 8	18,500	$105,190	$281,769	$386,959	$5.69
23673	AVONDALE 2 BLK F LOT 5	16,615	$101,491	$244,333	$345,824	$6.11
23676	AVONDALE 2 BLK F LOT 6	13,650	$66,014	$245,876	$311,890	$4.84
23679	AVONDALE 2 BLK F LOT 7(W 1/2)	6,343	$34,357	$1,776	$36,133	$5.42
23682	AVONDALE 2 BLK F LOT 7(E 1/2), 8	19,994	$108,122	$278,496	$386,618	$5.41
23691	AVONDALE 2 BLK F LOT 9(ALL),10(W 1/2)	13,650	$95,672	$185,946	$281,618	$7.01
23696	AVONDALE 2 BLK F LOT 10 (E1/2),11	13,650	$95,672	$133,876	$229,548	$7.01
23703	AVONDALE 2 BLK F LOT 12	16,109	$100,498	$263,502	$364,000	$6.24
23148	AVONDALE 2 BLK G LOT 1	17,829	$103,873	$218,811	$322,684	$5.83
22638	AVONDALE 2 BLK G LOT 2	13,832	$96,029	$236,854	$332,883	$6.94
22644	AVONDALE 2 BLK G LOT 3	9,375	$50,044	$267,132	$317,176	$5.34
22648	AVONDALE 3 BLK G LOT 4	16,380	$10,103	$0	$10,103	$0.62
23004	AVONDALE 3 BLK G LOT 5	16,470	$68,820	$251,207	$320,027	$4.18

The assessed land values range from $0.62/SF to $7.70/SF, with a mean value of $5.89/SF and a median value of $6.11/SF. If the highest and lowest indicator are removed, then the mean is $6.07/SF and the mean is $6.11/SF. A single unit land value of $6.10/SF has been selected as representative of the assessed unit value of the 21 individual tax parcels.

In this estimator's opinion the limitations placed on the use of the property by a perpetual channelization improvement easement will restrict 90% of the usability. Therefore, for Alternative 8A1, the channelization easement has been valued at 90% of the assessed unit value of the property.

80,000 SF X $6.10/SF X 90% = $439,200

17. CORRELATION/RECONCILIATION

- Alternative 2A1 — 90% of $33,319 per acre
- Alternative 2C1/2D1 — $32,016 per acre
- Alternative 8A1 — 90% of $6.10 per square foot

18. DAMAGES/SEVERANCES

Generally partial acquisition can result in a diminished market value for the remainder of the area and result in severance and/or non-economic damages being paid for the remnants and/or a tract that may become landlocked. For Alternative 2A1, given that the tract identified for the project is already public owned, no damages or severance are attributed to this scenario of the project. For Alternative 2C1/2D1, given that the proposed acquisition would be a total acquisition of the fee simple estate, no damages or severances are required. For Alternative 8A1, given that the land required for the project is unimproved and already encumbered by a drainage easement, no damages or severance are required.

19. INCREMENTAL REAL ESTATE COSTS

Relocation (PL 91-646): Government programs designed to benefit the public often result in the acquisition of private property and occasionally the displacement of people from their residences, businesses, non-profit organizations, or farms/ranches. To provide uniform and equitable treatment for persons displaced, Congress passed the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 and amended it in 1987. This law is simply called the Uniform Act (PL 91-646). Given the tracts are vacant, there are no relocations for this project.

Other Costs: In project cost estimates, there are various elements that are fluid and must be based on assumptions and generalized data. Property lines have not been surveyed, and detailed title research has not been performed. Complete inspections and comparisons of individual properties are not practical at this time. The project, if approved, will be implemented at an undetermined time in the future; and market conditions cannot be exactly projected. For these reasons, I believe a contingency of 20% is appropriate.

20. CONCLUSION

As requested by the client, the estimated project real estate cost was developed for each of the following three (3) alternatives.

1. Alternative 2A1 – Channel Improvement Easement on City Owned Tract PID 34607
   - 0.82 acres $24,590

2. Alternative 2C1/2D1 – Fee Simple acquisition of Privately Owned Tract PID 39529
   - 15.14 acres $484,715

3. Alternative 8A1 – Channel Improvement Easement on 21 Privately Owned Tracts in Avondale Subdivision
   - 1.837 acres $439,200

Damages/Severance		
Scenario 1		$0
Scenario 2		$0
Scenario 3		$0
Minerals		
Scenario 1		$0
Scenario 2		$0
Scenario 3		$0
Relocation (PL 91-646)		
Scenario 1		$0
Scenario 2		$0
Scenario 3		$0
Other Costs		
Scenario 1	$24,590 X 20% =	$4,918
Scenario 2	$484,715 X 20% =	$96,943
Scenario 3	$439,200 X 20% =	$87,840

Total Estimate by Scenario:

Scenario 1		**$29,508**
Land value	$24,590	
Damages/Severances	$0	
Minerals	$0	
Relocation	$0	
Other Costs	$4,918	
Scenario 2		**$581,658**
Land value	$484,715	
Damages/Severances	$0	
Minerals	$0	
Relocation	$0	
Other Costs	$96,943	
Scenario 3		**$527,040**
Land value	$439,200	
Damages/Severances	$0	
Minerals	$0	
Relocation	$0	
Other Costs	$87,840	

I certify that I have no personal interest, present or prospective, in the property, or with the owners thereof. The value reported represents my best unbiased judgement. Pursuant to ER 405-1-04, Paragraph 4-17, this estimate is exempt from the provisions of USPAP by virtue of a Jurisdictional Exception.

MILLER.WILLIAM.CLAYTON.1571442074
Digitally signed by MILLER.WILLIAM.CLAYTON.1571442074
Date: 2024.11.06 15:56:34 -06'00'

November 6, 2024

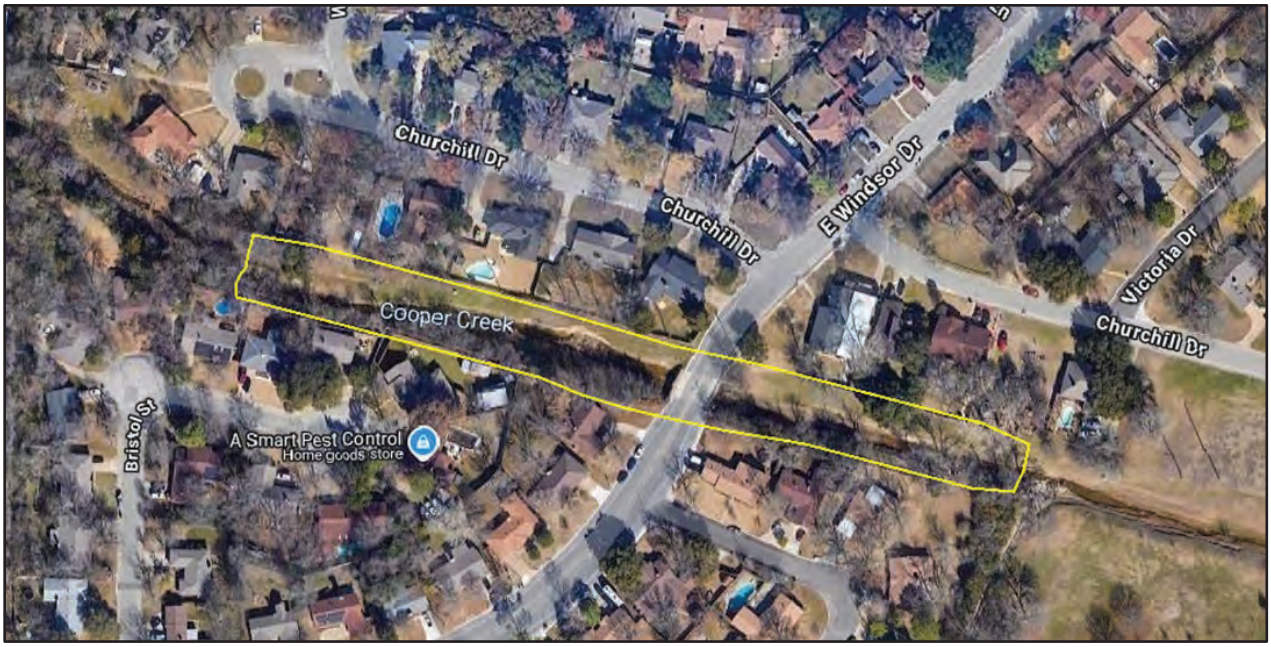
Clay Miller
Review Appraiser
USACE, Fort Worth District

22. AERIAL MAPS

Alternative 2A1

Alternative 2C1 / 2D1

Alternative 8A1



Appendix H: Hazardous, Toxic, Radioactive Waste

Cooper Creek, Denton, TX

Section 205

Closeout Report

February 2025

1.0 Introduction

In order to complete a feasibility level Hazardous, Toxic and Radioactive Waste (HTRW) evaluation for the Cooper Creek CAP 205 project, a report was completed following the rules and guidance of ER 1165-2-132: *HTRW Guidance for Civil Works Projects* and ASTM E1527-13 *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*. The purpose of this search was to identify any sites with recognized environmental conditions (RECs) where hazardous substances or petroleum products have been released or are likely to have been released to soil, groundwater, or surface water in the proposed project area.

2.0 Search Parameters

A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the project footprint. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts database, the Texas Commission on Environmental Quality's (TCEQ) Central Registry, and the Texas Railroad Commission's (RRC) oil and gas well Public GIS Viewer. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures.

3.0 Search Results

Federal National Priorities List (NPL) – The National Priorities List (NPL) is the list of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation. The records search did not reveal any NPL sites in the project footprint or adjacent areas. This is based on a search of the EPA Superfund National Priorities List (NPL) map viewer.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS database, now called the Superfund Enterprise Management System (SEMS), tracks hazardous waste sites where remedial action has occurred under EPA's Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) List – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search identified 1 site with corrective actions under RCRA within the project footprint or adjacent areas. Safety-Kleen Systems is half a mile from the Creek but this case is inactive currently and not anticipated to impact the project. This is based on a search of the EPA Cleanups in My Community map viewer.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Texas Commission on Environmental Quality Superfund Sites database.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the TCEQ Municipal Solid Waste Viewer.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Texas registered Underground Storage Tank (UST) and Above-ground Storage Tank (AST) databases, representing sites with storage tanks registered with the State of Texas. The search revealed 6 open/active USTs within one mile of the project area (**Figure 1**). Records indicate 3 reported releases; all 3 show a status of "No Further Action", indicating the regulatory agency was satisfied with the response measures. The nearest open/active USTs are approximately 0.5 miles from the creek and recommended to be avoided in construction footprint, otherwise additional investigation and response will be required. Due to the distances from the proposed project and the closed NFA status for the releases, none of these tanks are expected to pose an impact to the project. Therefore, no registered storage tanks will be carried forward as RECs. These results are based on searches of the TCEQ Petroleum Storage Tank Viewer and EPA UST Finder databases.

Toxic Release Inventory Sites - The Toxics Release Inventory (TRI) Database provides reports on releases, transfers, and waste managed for chemical releases reported. There are four sites that are within 1 mile of the project area but all were either closed or inactive and will not be considered as a REC. This was based on a search of the EPA TRI Explorer database.

State and Tribal Voluntary Cleanup Sites – The TCEQ Voluntary Cleanup Program (VCP) database identifies sites where the responsible party chooses to clean up the site themselves with TCEQ oversight.No sites from this database were identified within one mile of the work area, based on a search of the TCEQ Voluntary Cleanup Program using the Central Registry (CR) Query.

Brownfields List – A Brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. No sites from this database were identified within one mile of the work area, this was based on a search for Brownfields sites using the EPA Cleanups in My Community database.

Oil and Gas Wells – A search for oil and gas wells in the project area using the RRC website identified multiple oil and gas sites including wells and pipelines within the surrounding area (**Figure 3**). Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or be struck by a contractor's equipment during construction of the proposed project features. Precise locations for oil and gas infrastructure should be obtained during the Pre-construction Engineering and Design phase and additional environmental testing of soils may be necessary depending on the location of oil and gas wells and if they are within the project footprint. The Railroad Commission (RRC) Public GIS Viewer

was used to map these findings.

4.0 Conclusion

No Recognized Environmental Conditions were identified within one mile of the project area that could be reasonably expected to affect the Cooper Creek CAP 205 project. Although not classified as HTRW under USACE regulations, several oil and gas infrastructure sites were identified within the surrounding area. As a result of these findings, pipelines and wells within the project vicinity and along potential site access routes should be precisely located during PED to ensure no unintended interaction occurs with the existing oil and gas facilities.

Despite the lack of identified sites that could be reasonably expected to affect the project, there is always a possibility that previously unidentified HTRW could be uncovered, even when a proposed project is entirely within a pre-existing project footprint. An updated HTRW survey will be required should the project be reconsidered and funded at a future time. Additionally, care should be taken to identify and address HTRW concerns that may arise in a timely manner, so as not to affect proposed project timelines.

Figure 2: HTRW Sites

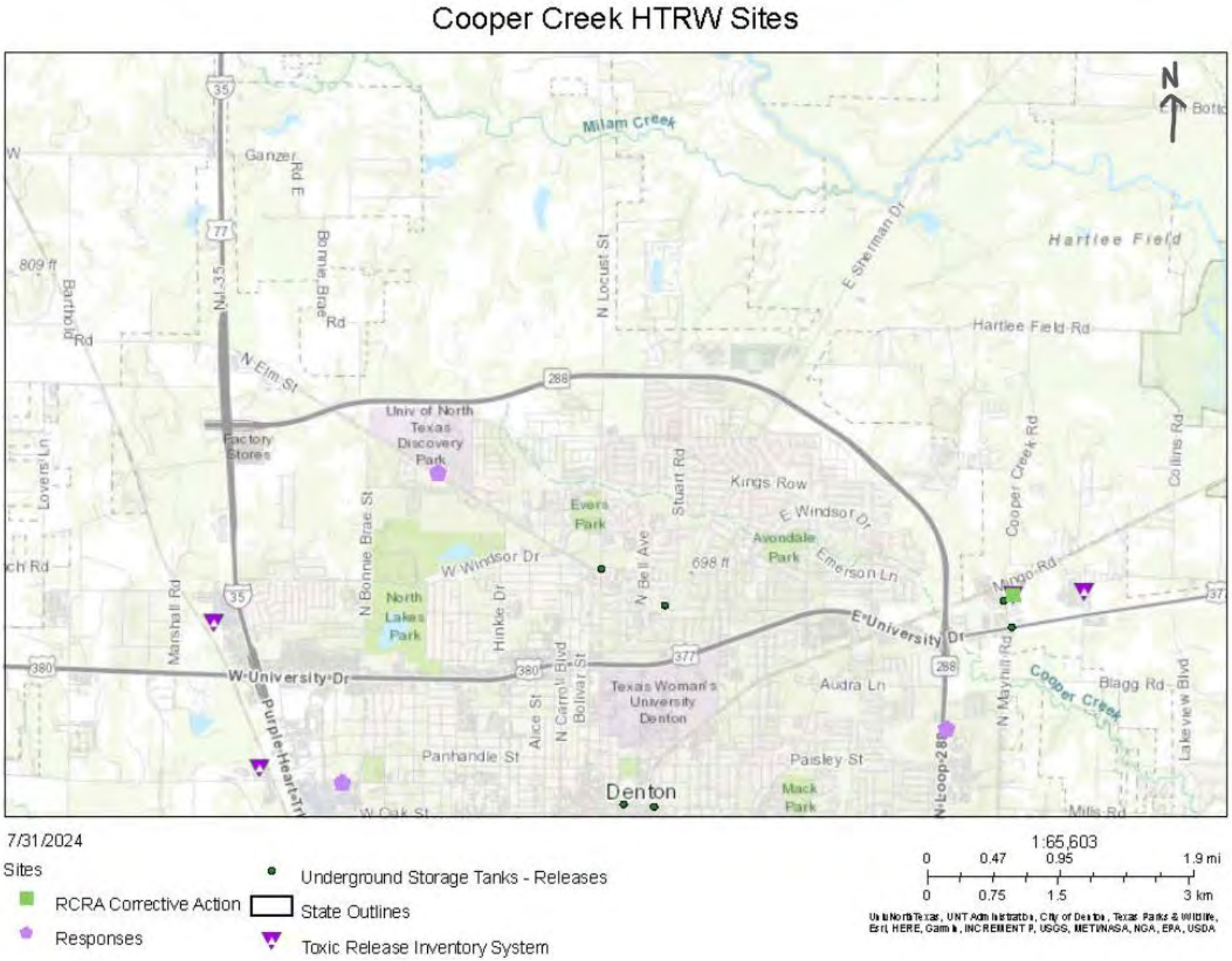
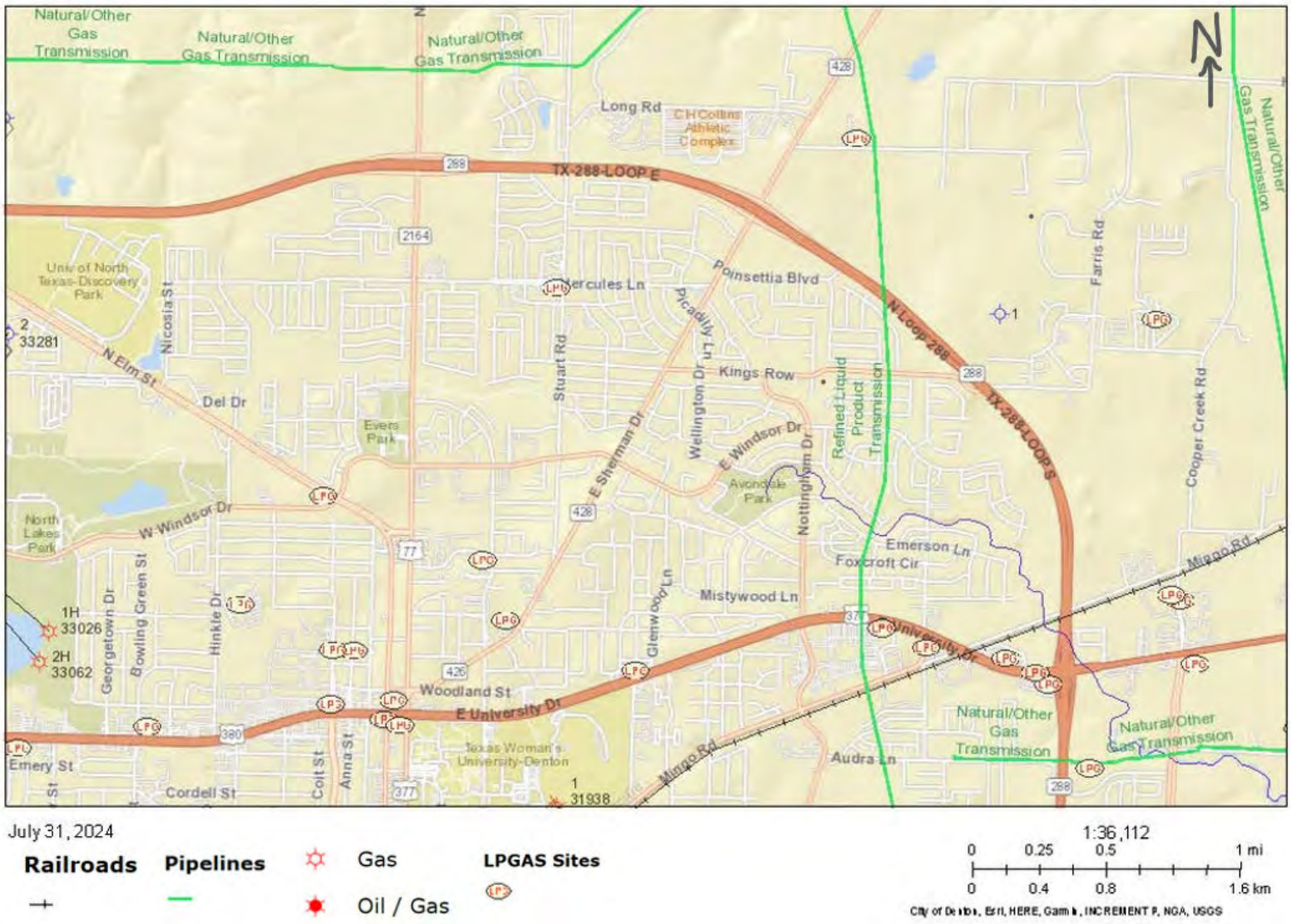


Figure 3: Oil & Gas Wells and Pipelines



INFORMAL STAFF REPORT
TO MAYOR AND CITY COUNCIL

SUBJECT:
On July 24, 2025, Denton Water Utilities filed comments with the Texas Commission on Environmental Quality (TCEQ) regarding two proposed Texas Pollutant Discharge Elimination System ("TPDES") permit applications submitted by outside entities.

EXECUTIVE SUMMARY:
A TPDES permit authorizes a person or entity to discharge wastewater into waters of the state. On Jan. 7, 2025, the City Council authorized the City Manager or their designee to protest TPDES permit applications filed with TCEQ that seek to discharge treated wastewater into Denton watersheds (Ordinance No. 24-2480). Protesting the applications and associated proposed permits is intended to safeguard water quality and to protect the City's interests related to wastewater regionalization.

DISCUSSION:
The protested TPDES permits are WQ0016632001, filed by 636 Denton Dev Company, LLC for "Sundance," and WQ0016624001, filed by Sanger Laguna Azure, LLC and James Horn. The **attached** Notices of Protest include the City's comments, which outline the concerns and bases for the protest. Water Utilities staff are available to address any questions.

ATTACHMENTS:

1. Notice of Protest WQ0016632001
2. Notice of Protest WQ0016624001

STAFF CONTACT:
Stephen Gay
General Manager of Water Utilities and Street Operations
Stephen.gay@cityofdenton.com
(940) 349-8086

CITY OF DENTON

Denton Water Utilities
901-A Texas St., Denton, TX 76209 • (940) 349-8086

July 23, 2025

Ms. Laurie Gharis, Chief Clerk
Texas Commission on Environmental Quality
Office of the Chief Clerk, MC-105
P.O. Box 13087
Austin, Texas 78711-3087l

Via First Class Mail and Electronic Filing

Re: City of Denton Comments and Request for Contested Case Hearing on Texas Pollution Discharge Elimination Permit Application No. WQ0016632001; Applicant, 636 Denton Dev Company, LLC

Dear Ms. Gharis,

Please accept these comments and request for contested case hearing ("Comment Letter") timely filed on behalf of the City of Denton, Texas. ("Denton" or "City"). Denton respectfully submits the following comments regarding proposed permit No. WQ0016632001 and the associated application filed by 636 Denton Dev Company, LLC ("636" or "Applicant") on September 24, 2024 ("Application"). The City submits its comments in accordance with Chapter 5, Subchapter M and Section 26.028 of the Texas Water Code and Title 30, Chapter 55 of the Texas Administrative Code. The City requests a contested case hearing regarding the Application and proposed permit number WQ0016632001.

I. BACKGROUND

Denton is a Texas home-rule municipality and a Retail Public Utility that provides water service to approximately 158,349 Texans within its City limits and many others throughout its service area and surrounding areas in Denton County. The City possesses Certificates of Convenience and Necessity Nos. 10195 (Water) and 20072 (Wastewater) issued by the Public Utility Commission of Texas. The City also holds Texas Pollution Discharge Elimination System ("TPDES"), Permit Nos. WQ0010027003 and WQ0014416001 and Certificates of Adjudication Nos. 08-2348 and 08-2335, which authorize the City to appropriate surface water from Lewisville Lake and Ray Roberts Lake, respectively. WQ0014416001 is associated with Clear Creek Water Reclamation Plant, a future City facility that will discharge into Clear Creek and that is located on property along the

path of the proposed discharge.[1] The Elm Fork Trinity River passes through the City's ETJ and connects Ray Roberts Lake and Lewisville Lake. Additionally, several noteworthy creeks run through the City and/or its ETJ – Clear Creek, Moores Branch, Pecan Creek, and Hickory Creek. All these creeks carry flows that eventually enter Lewisville Lake where the City possess water rights.

Denton adopted a new Wastewater Master Plan ("WMP") in 2024. The City uses the WMP as a planning tool to address rapid population growth and increased development in the City and the region. The WMP is intended to assist the City with its efforts to ensure efficient and sustainable management of wastewater, protect public health and safety, and construct wastewater treatment and conveyance infrastructure needed for the population growth projected over the next 25 years.

Applicant filed the Application on September 24, 2024. The Notice of Receipt and Intent to Obtain a Permit ("NORI"), issued on October 18, 2024, characterizes the proposed permit as follows:

> [T]o authorize the discharge of treated wastewater at a volume not to exceed a daily average flow of 480,000 gallons per day. The domestic wastewater treatment facility will be located approximately 3,400 feet northwest of the intersection of Farm-to- Market Road 2164 and Milam Road East, near the city of Denton, in Denton County, Texas 76207. The discharge route will be from the plant site to an unnamed tributary of Moores Branch; thence to Moores Branch; thence to Clear Creek; thence to Lewisville Lake.

Notably, the proposed facility is in the City's ETJ and CCN. The Executive Director issued a Notice of Application and Preliminary Decision ("NAPD") on June 26, 2025.

II. PUBLIC COMMENTS

At this time, the City of Denton contends that the Application should be denied, and the proposed permit should not be granted because:

A. The proposed permit is not protective of water quality;
B. The Applicant has failed to meaningfully consider regionalization under state law;
C. The Applicant has not demonstrated its need for the proposed permit; and
D. The Applicant has failed to satisfy the public involvement plan requirements.

A. The proposed permit is not protective of water quality.

The City is concerned the proposed permit will not be protective of water quality.[2] Under the proposed permit and in the proposed facility's final phase, the Applicant would discharge 0.48

[1] The facility is currently permitted for discharge of treated domestic wastewater at a daily average flow not to exceed 950,000 gallons per day. A permit amendment is pending that, if granted, would allow the City to increase its permitted discharge of treated domestic wastewater to a volume not to exceed an annual average flow of 10,000,000 gallons per day.
[2] See TEX. WATER CODE § 26.003.

MGD with no total phosphorous limit.[3] This unlimited additional loading of phosphorous into Moores Branch, Clear Creek, and Lewisville Lake may pose a threat to water quality. The water bodies at issue are high-quality and require careful consideration. Clear Creek (Segment 0823C) classified High Aquatic Life Use, is impaired, and is on the Texas 303(d) list for bacteria.[4] Moores Branch is classified High Aquatic Life Use. Lewisville Lake (Segment 0823) is located immediately downstream of the Elm Fork Trinity River and is classified High Aquatic Life Use, Public Water Supply, and Primary Contact Recreation.[5] Given the documented attributes of the water bodies along the discharge path and Lewisville Lake's status as a source of drinking water for Denton, Dallas, and the region, the City contends that there should be a total phosphorous limit in the proposed permit to prevent a lowering of water quality. The TCEQ should not issue a permit without said limit.

The NAPD states that an antidegradation review of the receiving waters has preliminarily determined that,

> [E]xisting water quality uses will not be impaired by this permit action. Numerical and narrative criteria to protect existing uses will be maintained. A Tier 2 review has preliminarily determined that *no significant degradation of water quality is expected* in Moores Branch and Clear Creek, which have been identified as having high aquatic life use. (emphasis added)

The City disputes this assessment due to the lack of a phosphorous limit and the uses and characteristics of the receiving waters described above. The City also disagrees with the Executive Director's description of the Tier 2 standard. "Significant degradation" is not the standard articulated in the TCEQ's rules.[6] Rather, the rules do not allow any degradation of waters, with degradation being defined as, "a lowering of water quality by more than a de minimis extent, but not to the extent that an existing use is impaired."[7] Thus, as a threshold matter, any degradation, whether significant or not, is prohibited under TCEQ rules.

The City also notes that there is an aggregate effect that should be considered when it comes to this Application and other pending applications that seek to discharge wastewater into the water bodies stated above. As of the date of this Comment Letter, multiple applications exist for wastewater treatment plants discharging less than 1 MGD into Denton watersheds. All these applications would discharge effluent into Lewisville Lake, resulting in multiple loads of less than 1 MGD. Together they represent a significant loading of pollutants into the Clear Creek and Lewisville Lake.

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[3] Technical Package at 17.
[4] 2024 Texas Integrated Report - Texas 303(d) List (Category 5) (Nov. 13, 2024) at 16.
[5] 30 TEX. ADMIN. CODE § 307.10 Appendix A. The NAPD erroneously states that the Segment No. is 0832, which is the number assigned to Lake Weatherford, not Lewisville Lake.
[6] 30 TEX. ADMIN. CODE § 307.5(b)(2).
[7] *Id.*

Finally, the City contends that the Applicant's package plant is not likely able to treat and manage PFAS and other emerging contaminants that require advanced treatment. Treatment technologies needed to address these contaminants in the long term can be better implemented and financed by existing wastewater systems with better financial and technical capabilities.[8] For these reasons, the Application should be denied, and the proposed permit should not be granted.

B. The Applicant failed to meaningfully consider regionalization under state law.

The Texas Constitution declares that there is a state policy to encourage development of regional wastewater systems.[9] Similarly, the Legislature has found that it is "necessary to the health, safety, and welfare of the people of this state to implement the state policy to encourage and promote the development and use of regional and area-wide waste collection, treatment, and disposal systems to serve the waste disposal needs of the citizens of the state and to prevent pollution and maintain and enhance the quality of the water in the state."[10] TCEQ is charged with implementing this policy and may deny a proposed permit based on consideration of need, "including the expected volume and quality of the influent and the availability of existing or proposed areawide or regional waste collection, treatment, and disposal systems."[11]

Meaningful and substantive consideration of regionalization is vital to the prosperity of the cities and communities surrounding proposed facilities. As TCEQ's Regionalization Policy observes,

> Regionalization promotes a long-term solution to wastewater management by consolidating wastewater collection, treatment, and disposal into larger service providers. Typically, existing systems with sufficient treatment capacity can offer wastewater treatment and disposal at a lower cost than constructing, operating, and maintaining a stand-alone system. Regional systems can distribute costs for capital improvement projects, like upgrades and repairs, over a larger customer base.[12]

Regionalization is good for customers as it spreads out long term costs, good for the environment due to the ability of larger systems to employ advanced treatment technologies, and good for water supply planning as it facilitates reuse projects and more efficiently distributes regional water supplies.[13] Promotion and encouragement of regional systems requires more than a thoughtless and rushed exercise to check boxes. Otherwise, the state's Regionalization policy is a goal without a compass or map to achieve it and the Texans who depend on thoughtful regional water and wastewater planning are lost.

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[8] *See* the City's discussion of regionalization below.
[9] TEX. CONST. ART. III, § 49-d.
[10] TEX. WATER CODE § 26.081(a). *See also*, TEX. WATER CODE § 26.003.
[11] TEX. WATER CODE § 26.0282.
[12] Tex. Comm'n on Envt'l Quality, Evaluating Regionalization for Proposed Wastewater Systems (Water Quality Division RG-632) (August 2023) at 3. Hereinafter referred to as "Regionalization Policy".
[13] The City is concerned that package plants, like the one proposed, are ill-equipped to treat for PFAS and emerging contaminants.

The Applicant has not meaningfully and substantively considered regionalization, nor have they provided the information required by the application. TCEQ's Regionalization Policy states "[i]f your proposed facility is within a three-mile radius of a permitted domestic wastewater system or a portion of your service area is within another utility's sewer CCN area, you must request service from the existing permitted system owner or operator."[14] The request for service must include, the "proposed facility's capacity, an inquiry for the total cost to connect to their sewer system and providing sewer services, as well as any additional conditions for receiving service.[15] The Applicant marked "Yes" in the application when asked whether any portion of its proposed service area is located within another utility's CCN.[16] This is accurate because the proposed facility is located within Denton's sewer CCN (No. 20072).[17] However, the Application does not demonstrate whether the Applicant requested service or received a response. Denton did not receive the service request required by the Application and Regionalization Policy. The application also requires applicants whose proposed service area is located in another utility's CCN "to attach a justification for the proposed facility and a cost analysis of expenditures that includes the cost of connecting to the CCN facilities versus the cost of the proposed facility or expansion."[18] The Applicant did not include the cost analysis in its application. Instead, the Applicant states, without detail, that, "Construction of a connection to, and the expansion of, the existing City of Denton or City of Sanger systems is anticipated to be more costly than construction of a new wastewater treatment facility."[19] This overbroad justification is insufficient.

The Applicant marked "Yes" on the Application when asked if there were any domestic permitted facilities or collection systems within a three-mile radius of the proposed facility.[20] In that case, the application requires the Applicant to "attach proof of mailing a request for service to each facility and collection system, the letters requesting service, and **correspondence from each facility and collection system**."[21] Again, the Applicant failed to provide any proof of mailing of service requests or a response. Denton has not received a mailed request for service, despite the City having a collection system within three (3) miles of the proposed facility.[22]

The City of Denton is willing to discuss service, especially given the City's plans for the Clear Creek Water Reclamation Plant, a facility that is located on property along the path of the proposed discharge. For these reasons, the Application should be denied, and the proposed permit should not be granted.

C. The Applicant has not demonstrated its need for the proposed permit.

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[14] Regionalization Policy at 4.
[15] *Id.*
[16] Admin. Packet at 84.
[17] *Id.* at 105. The Applicant's map acknowledges this fact.
[18] *Id.* at 84-85. *See also* Application Instructions at 56.
[19] Admin. Packet at 106.
[20] *Id.* at 85 and 105.
[21] *Id.* (emphasis added).
[22] *See* Exhibit "A" attached hereto.

The Applicant states in the Application, "[t]he land with the proposed plant service area, approximately 633 acres in total, is in the process of being platted with Denton County. The area served by the proposed plant will consist primarily of single-family residential with a smaller portion of mixed commercial land use."[23] The Applicant also provides an assumed number of EDUs to calculate flows, but without providing the basis or foundation of its assumption. This justification is insufficient. Technical Report 1.1 requires "a detailed discussion regarding the need for any phase(s) not currently permitted."[24] Moreover, the Application Instructions require the Applicant to provide a **justification**.[25] For example, applicants are required to provide, "an anticipated construction start date and operation schedule for each phase being proposed," the size of the development (number of lots)", "the date construction on the development is scheduled to begin," and "the anticipated growth rate of the development (number of houses per month or year)."[26] Most notably, the Application Instructions state that applicants should,

> Attach population estimates and/or projections used to derive the flow estimates and anticipated growth rates for developments. Provide the source and basis upon which population figures were derived (census and/or other methodology). Also, provide population projections at the end of the design life of the treatment facility (usually 50+ years) and the source and basis upon which population figures were derived.[27]

None of the more detailed information (E.g., schedules, number of lots, or population projections and sources) mentioned above is provided by the Applicant. The Applicant is told in the Application and the Application Instructions that the Executive Director may recommend denial if insufficient information is provided.[28] Without this information, how can the ED evaluate need in accordance with the Texas Water Code?[29] More is needed before the Commission should grant the proposed permit, especially given the concerns raised above in Sections A and B of this Comment Letter and the ability and/or willingness of other systems to serve the area associated with the Application. Because the Applicant has failed to demonstrate need, the Application should be denied, and the proposed permit should not be granted.

D. The Applicant has failed to satisfy the public involvement plan requirements.

In the Public Involvement Plan Form for Permit and Registration Applications, the Applicant states it does not anticipate any significant public interest in the application.[30] However, given the proximity of the proposed discharge to Denton (it is in the City's ETJ) and the discharge route, the Applicant knows or should have known there would be significant public interest. The discharge will travel into Lewisville Lake, a drinking water supply for approximately 3 million people,

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[23] Admin. Package at 84.
[24] *Id.*
[25] Application Instructions at 55.
[26] *Id.*
[27] *Id.*
[28] Admin. Package at 53 and Application Instructions at 55.
[29] TEX. WATER CODE § 26.0282.
[30] Admin. Package at 42-43.

including Denton and Dallas and their respective wholesale customers. The Applicant states that the site is in a rural part of Denton County, but the discharge will travel through populated areas within Denton.[31] The form is incomplete and additional outreach should be required. For these reasons, the Application should be denied, and the proposed permit should not be granted.

III. REQUEST FOR CONTESTED CASE HEARING

I, on behalf of the City of Denton, respectfully request a contested case hearing to address the issues raised in this Comment Letter with respect to the Application and proposed permit number WQ0016632001.

IV. DESCRIPTION OF AFFECTED PERSON STATUS

The City is an affected person for several reasons. Pursuant to TEX. WATER CODE § 5.115 and 30 TEX. ADMIN. CODE § 55.203, "an affected person is one who has a personal justiciable interest related to a legal right, duty, privilege, power, or economic interest affected by the application."[32] Interests common to the members of the general public do not qualify.[33] Governmental entities, like the City, with "authority under state law over issues raised by [an] application," can be affected persons.[34] Among other relevant factors, in assessing whether to grant affected person status, the TCEQ may consider:

> 1. Whether the interest claimed is one protected by the law under which the application will be considered;
>
> 2. Distance restrictions or other limitations imposed by law on the affected interest;
>
> 3. Whether a reasonable relationship exists between the interest claimed and the activity regulated;
>
> 4. Likely impact of the regulated activity on the health and safety of the person, and on the use of property of the person;
>
> 5. Likely impact of the regulated activity on use of the impacted natural resource by the person;
>
> 6. For a hearing request on an application filed on or after September 1, 2015, whether the requestor timely submitted comments on the application that were not withdrawn; and
>
> 7. For governmental entities, their statutory authority over or interest in the issues relevant to the application.[35]

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[31] *Id.* at 42.
[32] 30 TEX. ADMIN. CODE § 55.203.
[33] *Id.*
[34] *Id.*
[35] *Id.*

The TCEQ may also consider, "the merits of the underlying application and supporting documentation in the commission's administrative record, including whether the application meets the requirements for permit issuance."[36]

As stated in the Background section of this Comment Letter, Denton is a Retail Public Utility that serves approximately 158,349 Texans within its city limits and many others in its service area and surrounding portions of Denton County. Denton is a holder of water rights to appropriate Waters of the State stored in Lewisville Lake. The proposed discharge enters waters that flow through the City's ETJ, through its City limits, and eventually into Lewisville Lake. The Facility and its service area is located in Denton's ETJ and its CCN (No. 20072) The City's CCN and ETJ provide it with statutory authority over wastewater service and other issues relevant to the Application.[37] Therefore, the City, a governmental entity, has interests not common to members of the public, has interests protected by state law related to its water rights and CCN, and has a statutory interest over or interest in the issues relevant to the Application, including retail wastewater service.

Any adverse impact on water quality associated with the proposed discharge could negatively impact Denton's diversion of water from Lewisville Lake both from a financial and technical perspective. As a home- rule municipality, Denton has an interest in and the authority to protect its customers and public health and safety within its jurisdictional boundaries, including its extraterritorial jurisdiction.[38] Also, as a provider of water and wastewater service inside and outside its corporate limits, the City has an interest in ensuring orderly development using regional and area-wide wastewater disposal systems.[39] A portion of Denton's wastewater collection system is within (3) miles of the proposed facility and the City is capable of treating the wastewater flows contemplated by the Application.[40] The discharge proposed by the Application may adversely affect waters within the City and/or its jurisdictional boundaries. Specifically, the City is concerned that the proposed discharge will degrade water quality thereby impacting the municipal, environmental, and recreational uses of waters in the City and in Lewisville Lake, adversely affecting the City's efforts to manage stormwater, and increasing the cost of service to the City's customers.

The City contends that a contested case hearing is necessary to ensure that the Application and associated discharge will comply with state and federal law and will not negatively impact the City, its residents, its ETJ, and its neighbors. An evidentiary hearing with sworn testimony in front of a neutral fact finder is essential to ensure that the Application conforms with state and federal law.

V. ADDITION TO THE MAILING LIST AND CORRESPONDENCE

---

[36] *Id.*
[37] *See* TEX. WATER CODE Ch. 13, Subchapter G and infra note 38.
[38] *See* TEX. LOC. GOV'T CODE §§ 42.001, 54.004, 212.003, 212.044, and 242.001.
[39] *See* TEX. WATER CODE § 26.081(a).
[40] See Exhibit "A" attached hereto.

In accordance with Title 30, Chapter 55 of the Texas Administrative Code, please add the following contacts to your official mailing list for this matter:

Stephen Gay, General Manager of Water Utilities and Street Operations
City of Denton
901-A Texas Street
Denton, TX 76209
(940) 349-8086

Mack Reinwand, City Attorney
City of Denton
215 E. McKinney St.
Denton, TX 76201
(940) 349-8333

Please send all future correspondence to me using the address and telephone number provided above.

VI. CONCLUSION

Denton respectfully submits these comments for consideration by the Executive Director and requests a contested case hearing regarding this matter. For the reasons stated above in the City's comments, the Application does not meet the requirements for permit approval, the Application should be denied, and the proposed permit should not be granted.

If you have any questions or need any additional information, please feel free to contact me.

Sincerely,

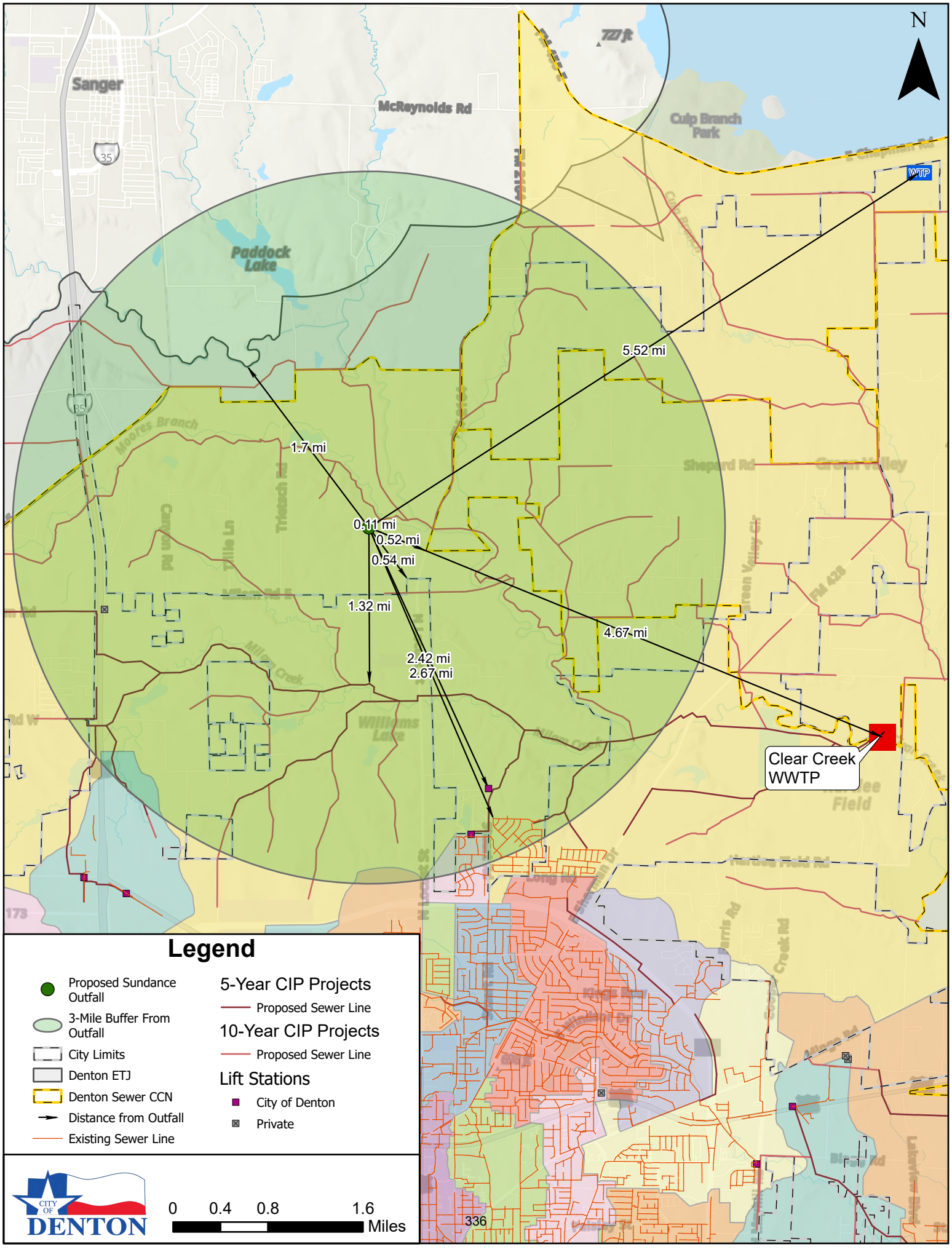
Stephen Gay
General Manager, Water Utilities and Street Operations

Copy: Sara Hensley, City Manager
Mack Reinwand, City Attorney

Enclosures

Exhibit A

Facility Map


N
Sanger
McReynolds Rd
Culp Branch Park
Paddock Lake
WTP
5.52 mi
1.7 mi
0.11 mi
0.52 mi
0.54 mi
1.32 mi
4.67 mi
2.42 mi
2.67 mi
Clear Creek WWTP
Legend
Proposed Sundance Outfall
3-Mile Buffer From Outfall
City Limits
Denton ETJ
Denton Sewer CCN
Distance from Outfall
Existing Sewer Line
5-Year CIP Projects
Proposed Sewer Line
10-Year CIP Projects
Proposed Sewer Line
Lift Stations
City of Denton
Private
CITY OF DENTON
0 0.4 0.8 1.6
Miles
336

CITY OF DENTON

Denton Water Utilities
901-A Texas St., Denton, TX 76209 • (940) 349-8086

July, 23, 2025

Ms. Laurie Gharis, Chief Clerk
Texas Commission on Environmental Quality
Office of the Chief Clerk, MC-105
P.O. Box 13087
Austin, Texas 78711-30871
Via First Class Mail and Electronic Filing

Re: City of Denton Comments and Request for Contested Case Hearing on Texas Pollution Discharge Elimination Permit Application No. WQ0016624001; Applicants Sanger Laguna Azure LLC and James N. Horn

Dear Ms. Gharis,

Please accept these comments and request for contested case hearing ("Comment Letter") timely filed on behalf of the City of Denton, Texas. ("Denton" or "City"). Denton respectfully submits the following comments regarding proposed permit No. WQ0016624001 and the associated application filed by Sanger Laguna Azure LLC ("Sanger Laguna Azure") and James N. Horn ("Mr. Horn") on September 16, 2024 ("Application"). The City submits its comments in accordance with Chapter 5, Subchapter M and Section 26.028 of the Texas Water Code and Title 30, Chapter 55 of the Texas Administrative Code. The City requests a contested case hearing regarding the Application and proposed permit number WQ0016624001.

I. BACKGROUND

Denton is a Texas home-rule municipality and Retail Public Utility that provides water service to approximately 158,349 Texans within its City limits and many others throughout its service area and surrounding areas in Denton County. The City possesses Certificates of Convenience and Necessity Nos. 10195 (Water) and 20072 (Wastewater) issued by the Public Utility Commission of Texas. The City also holds Texas Pollution Discharge Elimination System ("TPDES"), Permit Nos. WQ0010027003 and WQ0014416001 and Certificates of Adjudication Nos. 08-2348 and 08-2335, which authorize the City to appropriate surface water from Lewisville Lake and Ray Roberts Lake, respectively. WQ0014416001 is associated with Clear Creek Water Reclamation Plant, a future City facility that will discharge into Clear Creek and that is located on property along the

path of the proposed discharge.[1] The Elm Fork Trinity River passes through the City's ETJ and connects Ray Roberts Lake and Lewisville Lake. Additionally, several noteworthy creeks run through the City and/or its ETJ – Clear Creek, Pecan Creek, and Hickory Creek. All these creeks carry flows that eventually enter Lewisville Lake where the City possess water rights.

Denton adopted a new Wastewater Master Plan ("WMP") in 2024. The City uses the WMP as a planning tool to address rapid population growth and increased development in the City and the region. The WMP is intended to assist the City with its efforts to ensure efficient and sustainable management of wastewater, protect public health and safety, and construct wastewater treatment and conveyance infrastructure needed for the population growth projected over the next 25 years.

Sanger Laguna Azure and Mr. Horn (Collectively, "Applicants") filed the Application on September 16, 2024. The Notice of Receipt and Intent to Obtain a Permit ("NORI"), issued on October 9, 2024, characterizes the proposed permit as follows:

> [T]o authorize the discharge of treated wastewater at a volume not to exceed a daily average flow of 950,000 gallons per day. The domestic wastewater treatment facility will be located approximately 0.77 miles northwest of the intersection of Farm-to-Market Road 2153 and Farm-to-Market Road 2164, near the city of Sanger, in Denton County, Texas 76266. The discharge route will be from the plant site to an unnamed tributary, thence to another unnamed tributary, thence to Clear Creek, thence to Elm Fork Trinity River.

On July 1, 2025, the Executive Director scheduled a public meeting and issued a Notice of Application and Preliminary Decision ("NAPD") and draft permit. The City reserves its right to supplement and/or amend this Comment Letter to address any issues it identifies after the public meet.

II. PUBLIC COMMENTS

At this time, the City of Denton contends that the Application should be denied, and the proposed permit should not be granted because:

A. The proposed permit is not protective of water quality;
B. The Applicants have failed to meaningfully consider regionalization under state law;
C. The Applicants have not demonstrated their need for the proposed permit;
D. The Applicants have failed to satisfy the public involvement plan requirements;
E. The Applicants have failed to meet the sludge and biosolids management and disposal requirements; and
F. Notice is defective.

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[1] *See* Exhibit "A", attached hereto. The facility is currently permitted for discharge of treated domestic wastewater at a daily average flow not to exceed 950,000 gallons per day. A permit amendment is pending that, if granted, would allow the City to increase its permitted discharge of treated domestic wastewater to a volume not to exceed an annual average flow of 10,000,000 gallons per day.

A. The proposed permit is not protective of water quality.

The City is concerned the proposed permit will not be protective of water quality.[2] In the proposed facility's final phase, the Applicant would discharge 0.95 MGD with no total phosphorous limit.[3] This unlimited additional loading of phosphorous into Clear Creek, Elm Fork Trinity River, and Lewisville Lake may pose a threat to water quality. The water bodies at issue are high-quality and require careful consideration. Clear Creek (Segment 0823C) classified High Aquatic Life use, is impaired, and is on the Texas 303(d) list for bacteria.[4] The Elm Form Trinity River (Segment 0839) is classified High Aquatic Life Use and Primary Contact Recreation.[5] Lewisville Lake (Segment 0823) is located immediately downstream of the Elm Fork Trinity River and is classified High Aquatic Life Use, Public Water Supply, and Primary Contact Recreation.[6] Given the documented attributes of the water bodies along the discharge path and Lewisville Lake's status as a source of drinking water for Denton, Dallas, and the region, the City contends that there should be a total phosphorous limit in the proposed permit to prevent a lowering of water quality. The TCEQ should not issue a permit without said limit.

The NAPD states that an antidegradation review of the receiving waters has preliminarily determined that,

> [E]xisting water quality uses will not be impaired by this permit action. Numerical and narrative criteria to protect existing uses will be maintained. A Tier 2 review has preliminarily determined that *no significant degradation* of water quality is expected in Clear Creek, which has been identified as having high aquatic life uses. Existing uses will be maintained and protected. (emphasis added)

The City disputes this assessment due to the lack of a phosphorous limit and the uses and characteristics of the receiving waters described above. The City also disagrees with the Executive Director's description of the Tier 2 standard. "Significant degradation" is not the standard articulated in the TCEQ's rules.[7] Rather, the rules do not allow any degradation of waters, with degradation being defined as, "a lowering of water quality by more than a de minimis extent, but not to the extent that an existing use is impaired."[8] Thus, as a threshold matter, any degradation, whether significant or not, is prohibited under TCEQ rules.

The City also notes that there is an aggregate effect that should be considered when it comes to this Application and other pending applications that seek to discharge wastewater into the water bodies stated above. As of the date of this Comment Letter, multiple applications exist for wastewater treatment plants discharging less than 1 MGD into Denton watersheds. All these

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[2] See TEX. WATER CODE § 26.003.
[3] Admin. Package at 36 and 56.
[4] 2024 Texas Integrated Report - Texas 303(d) List (Category 5) (Nov. 13, 2024) at 16.
[5] 30 TEX. ADMIN. CODE § 307.10 Appendix A.
[6] *Id.*
[7] 30 TEX. ADMIN. CODE § 307.5(b)(2).
[8] *Id.*

applications would discharge effluent into Lewisville Lake, resulting in multiple loads of less than 1 MGD. Together they represent a significant loading of pollutants into the receiving waters.

Finally, the City contends that the Applicant's package plant is not likely able to treat and manage PFAS and other emerging contaminants that require advanced treatment. Treatment technologies needed to address these contaminants in the long term can be better implemented and financed by existing wastewater systems with better financial and technical capabilities.[9] For these reasons, the Application should be denied, and the proposed permit should not be granted.

B. The Applicants have failed to meaningfully consider regionalization under state law.

The Texas Constitution declares that there is a state policy to encourage development of regional wastewater systems.[10] Similarly, the Legislature has found that it is "necessary to the health, safety, and welfare of the people of this state to implement the state policy to encourage and promote the development and use of regional and area-wide waste collection, treatment, and disposal systems to serve the waste disposal needs of the citizens of the state and to prevent pollution and maintain and enhance the quality of the water in the state."[11] TCEQ is charged with implementing this policy and may deny a proposed permit based on consideration of need, "including the expected volume and quality of the influent and the availability of existing or proposed areawide or regional waste collection, treatment, and disposal systems."[12]

Meaningful and substantive consideration of regionalization is vital to the prosperity of the cities and communities surrounding proposed facilities. As TCEQ's Regionalization Policy observes,

> Regionalization promotes a long-term solution to wastewater management by consolidating wastewater collection, treatment, and disposal into larger service providers. Typically, existing systems with sufficient treatment capacity can offer wastewater treatment and disposal at a lower cost than constructing, operating, and maintaining a stand-alone system. Regional systems can distribute costs for capital improvement projects, like upgrades and repairs, over a larger customer base.[13]

Regionalization is good for customers as it spreads out long term costs, good for the environment due to the ability of larger systems to employ advanced treatment technologies, and good for water supply planning as it facilitates reuse projects and more efficiently distributes regional water supplies.[14] Promotion and encouragement of regional systems requires more than a thoughtless and rushed exercise to check boxes. Otherwise, the state's Regionalization policy is a

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[9] Admin. Package at 94. *See also* the City's discussion of regionalization below.
[10] TEX. CONST. ART. III, § 49-d.
[11] TEX. WATER CODE § 26.081(a). *See also*, TEX. WATER CODE § 26.003.
[12] TEX. WATER CODE § 26.0282.
[13] Tex. Comm'n On Envt'l Quality, Evaluating Regionalization for Proposed Wastewater Systems (Water Quality Division RG-632) (August 2023) at 3. Hereinafter referred to as "Regionalization Policy".
[14] The City is concerned that package plants, like the one proposed, are ill-equipped to treat for PFAS and emerging contaminants.

goal without a compass or map to achieve it and the Texans who depend on thoughtful regional water and wastewater planning are lost.

The Applicants have not meaningfully and substantively considered regionalization, nor have they provided the information required by the application. TCEQ's Regionalization Policy states that a request for service must include, the "proposed facility's capacity, an inquiry for the total cost to connect to their sewer system and providing sewer services, as well as any additional conditions for receiving service."[15] The request letters provided in the Application do not ask for any information regarding costs or inquire as to service conditions.[16] The Application also does not demonstrate whether the Applicants received a response. How could it, though? The Application was filed on September 16, 2024, and the letters are dated September 12, 2024. That is a short period of time to have any meaningful correspondence with Sanger and Denton or to conduct any sort of meaningful analysis.[17] The Applicants marked "Yes" on the Application when asked if there were any domestic permitted facilities or collection systems within a three-mile radius of the proposed facility.[18] In that case, the application requires the Applicants to "attach proof of mailing a request for service to each facility and collection system, the letters requesting service, and **correspondence from each facility and collection system**."[19] Again, the Applicants failed to provide any proof of response to their letters.[20]

Domestic Wastewater Permit Application Technical Report 1.1 asks whether any part of the proposed service area is within the Certificate of Convenience and Necessity ("CCN") of another utility.[21] If so, the application requires applicants "to attach a justification for the proposed facility and a cost analysis of expenditures that includes the cost of connecting to the CCN facilities versus the cost of the proposed facility or expansion."[22] The proposed service area is located with the City of Sanger's Certificate of Convenience and Necessity No. 20073. Denton's Sewer CCN is within a three-mile radius of the proposed facility and is directly adjacent to Sanger's CCN. The Applicants acknowledge these facts in the Application.[23] However, they did not include the cost analysis. Instead, they state, without detail, that "[c]onstruction of a connection to the city's existing system is anticipated to be more costly than construction of a new wastewater treatment facility."[24] This broad justification lacks detail and is insufficient. The City of Denton is willing to discuss service, especially given the City's plans for the Clear Creek Water Reclamation Plant, a facility that will be located on property less than six (6) miles away from and along the path of the

[15] Regionalization Policy at 4.
[16] Admin. Package at 101-102. *See also* example letter in Tex. Comm'n On Envt'l Quality, Instructions For Completing The Domestic Wastewater Permit Application (TCEQ-10053ins) at 115 (Oct. 17, 2024). Hereinafter referred to as "Application Instructions".
[17] Admin. Package at 101-102.
[18] *Id.* at 54.
[19] *Id.* (emphasis added).
[20] Admin. Package at 101-102
[21] Admin. Package at 53.
[22] Admin. Package at 54. *See also* Application Instructions at 56.
[23] Admin. Package at 100.
[24] *Id.* at 112.

proposed discharge.[25] Additionally, pursuant to its capital improvement plan and WMP, the City will construct two lines within 5 miles of the proposed discharge.[26] The City is already engaged in land acquisition and design for one of these lines (a gravity main) that will be constructed within three years and approximately 4 miles from the proposed discharge. However, the Applicant has not approached Denton for any substantive discussions that demonstrate the Applicant's serious consideration of connection to the City's system. For these reasons, the Application should be denied, and the proposed permit should not be granted.

C. The Applicants have not demonstrated their need for the proposed permit.

The Applicants state in the Application, without detail, "[t]his permit is needed for the new wastewater treatment facility that will serve the proposed Sanger Laguna Azure residential development."[27] The Applicants provide no other information or details to support this claim. Instead, the Applicants provide a sentence with circular reasoning.[28] Technical Report 1.1 requires "a detailed discussion regarding the need for any phase(s) not currently permitted."[29] Moreover, the Application Instructions require the Applicants to provide a **justification**.[30] For example, applicants are required to provide, "an anticipated construction start date and operation schedule for each phase being proposed," the size of the development (number of lots)", "the date construction on the development is scheduled to begin," and "the anticipated growth rate of the development (number of houses per month or year)."[31] Most notably, the Application Instructions state that the applicants should,

> Attach population estimates and/or projections used to derive the flow estimates and anticipated growth rates for developments. Provide the source and basis upon which population figures were derived (census and/or other methodology). Also, provide population projections at the end of the design life of the treatment facility (usually 50+ years) and the source and basis upon which population figures were derived.[32]

The Applicants are told in the Application and the Application Instructions that the Executive Director may recommend denial if insufficient information is provided. [33] Without this information, how can the ED evaluate need in accordance with the Texas Water Code?[34] More is needed before the Commission should grant the proposed permit, especially given the concerns raised above in Sections A and B of this Comment Letter and the ability and/or willingness of

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[25] See Exhibit "A" attached hereto.
[26] *Id.* A line will be constructed approximately 4 miles away and a second line with be constructed less than a half a mile away.
[27] Admin. Package at 53.
[28] I.e., "this permit is needed because it is needed."
[29] Admin. Package at 53.
[30] Application Instructions at 55.
[31] *Id.*
[32] *Id.*
[33] Admin. Package at 53 and Application Instructions at 55.
[34] TEX. WATER CODE § 26.0282.

other systems to serve the area associated with the Application. Because the Applicants have failed to demonstrate need, the Application should be denied, and the proposed permit should not be granted.

D. The Applicants have failed to satisfy the public involvement plan requirements.

In the Public Involvement Plan Form for Permit and Registration Applications, the Applicants state they do not anticipate any significant public interest in the Application.[35] However, given the proximity of the proposed discharge to Denton and the City of Sanger and the discharge route, the Applicants knew or should have known there would be significant public interest. The discharge will travel into Lewisville Lake, a drinking water supply for approximately 3 million people, including Denton and Dallas and their respective wholesale customers. The City of Denton is a wholesale water supplier to Upper Trinity Regional Water District who sells water it receives from Denton to Sanger. The Applicants' affected landowner map and list indicate there are twenty-three (22) affected landowners.[36] Also, Mr. Horn has owned the property in this area for quite some time. He should be aware of the Rainbow Valley and Whitehawk communities and the conservation easement downstream of the discharge. The form is incomplete and additional outreach should be required. For these reasons, the Application should be denied, and the proposed permit should not be granted.

E. The Applicants have failed to meet the sludge and biosolids management and disposal requirements.

In the Application, the Applicants state the proposed facility will generate biosolids and that it will dispose of them in a landfill.[37] However, the method of transportation and the disposal site are listed as "TBD."[38] The application requires that these portions be completed. The Application Instructions state to, "Provide **detailed information** for each disposal site."[39] This information includes, "the name of the site, the site's permit or registration number, and the county in which each disposal site is located."[40] Likewise, the next subsection requires a "method used to transport the sludge to the disposal site."[41] The Applicants have not provided the information and there is no way for the TCEQ to know where the biosolids will be disposed or if there is a disposal site willing to accept them.[42] Because the Applicants have failed to include this information, the Application should be denied, and the proposed permit should not be granted.

F. Notice is Defective.

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[35] Admin. Package at 77-78.
[36] *Id.* at 83-85.
[37] *Id.* at. 46-47.
[38] *Id.*
[39] *Id.* at 51 (emphasis added).
[40] *Id.*
[41] *Id.*
[42] This is especially important given the fluidity of the regulatory landscape and risk tolerance with respect to PFAS as a hazardous substance.

The Applicant states in the Administrative Package for Application WQ0016624001 ("Admin. Package") that the proposed discharge will travel to Lewisville Lake. However, the path of the proposed discharge to Lewisville Lake is not mentioned the description provided in the NORI. Lewisville Lake is mentioned in the NAPD, though: "The treated effluent will be discharged to an unnamed tributary, thence to another unnamed tributary, thence to Clear Creek, thence to Lewisville Lake in Segment No. 0823 of the Trinity River Basin." This inconsistency is concerning to the City and constitutes defective notice.[43] Does the discharge flow to Elm Fork Trinity River or directly to Lewisville Lake? It's not possible to tell from the plain text of the notices. The TCEQ's rules require the names of the receiving waters. That information must be clear and consistent in both the NORI and the NAPD.[44] Moreover, entities or persons interested in tracking and evaluating proposed discharges to Lewisville Lake may have disregarded the NORI and this matter because the NORI did not reference Lewisville Lake.

III. REQUEST FOR CONTESTED CASE HEARING

I, on behalf of the City of Denton, respectfully request a contested case hearing to address the issues raised in this Comment Letter with respect to the Application and proposed permit number WQ0016624001. In addition, the City reserves the right to supplement and/or amend this Comment Letter to address any issues it identifies after the public meeting.

IV. DESCRIPTION OF AFFECTED PERSON STATUS

The City is an affected person for several reasons. Pursuant to TEX. WATER CODE § 5.115 and 30 TEX. ADMIN. CODE § 55.203, "an affected person is one who has a personal justiciable interest related to a legal right, duty, privilege, power, or economic interest affected by the application."[45] Interests common to the members of the general public do not qualify.[46] Governmental entities, like the City, with "authority under state law over issues raised by [an] application," can be affected persons.[47] Among other relevant factors, in assessing whether to grant affected person status, the TCEQ may consider:

> 1. Whether the interest claimed is one protected by the law under which the application will be considered;
>
> 2. Distance restrictions or other limitations imposed by law on the affected interest;
>
> 3. Whether a reasonable relationship exists between the interest claimed and the activity regulated;
>
> 4. Likely impact of the regulated activity on the health and safety of the person, and on the use of property of the person;

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[43] 30 TEX. ADMIN. CODE §§ 39.411(b), 39.418(b), and 39.551(c).
[44] *Id.*
[45] 30 TEX. ADMIN. CODE § 55.203.
[46] *Id.*
[47] *Id.*

> 5. Likely impact of the regulated activity on use of the impacted natural resource by the person;
>
> 6. For a hearing request on an application filed on or after September 1, 2015, whether the requestor timely submitted comments on the application that were not withdrawn; and
>
> 7. For governmental entities, their statutory authority over or interest in the issues relevant to the application.[48]

The TCEQ may also consider, "the merits of the underlying application and supporting documentation in the commission's administrative record, including whether the application meets the requirements for permit issuance."[49]

As stated in the Background section of this Comment Letter, Denton is a Retail Public Utility that serves approximately 158,349 Texans within its city limits and many others in its service area and surrounding portions of Denton County. Denton is a holder of water rights to appropriate Waters of the State stored in Lewisville Lake, a regional water supply to Dallas, Denton, and many other cities and utilities. The proposed discharge enters waters that flow through the City's ETJ (*located less than a one (1) mile from the proposed discharge*), through its City limits (*located less than one (1) mile from the proposed discharge*), and eventually into Lewisville Lake (*located approximately nine (9) miles from the proposed discharge*).[50] Therefore, the City, a governmental entity, has interests not common to members of the public, has interests protected by state law related to its water rights, and has a statutory interest over or interest in the issues relevant to the Application.

Any adverse impact on water quality associated with the proposed discharge could negatively impact Denton's diversion of water from Lewisville Lake both from a financial and technical perspective. As a home-rule municipality, Denton has an interest in and the authority to protect its customers and public health and safety within its jurisdictional boundaries, including its extraterritorial jurisdiction.[51] Also, as a provider of water and wastewater service inside and outside its corporate limits, the City has an interest in ensuring orderly development using regional and area-wide wastewater disposal systems.[52] Denton intends to construct a wastewater facility less than six (6) miles from the proposed outfall that is capable of treating the wastewater flows contemplated by the Application.[53] The discharge proposed by the Application may adversely affect waters within the City and/or its jurisdictional boundaries. Specifically, the City is concerned that the proposed discharge will degrade water quality thereby impacting the municipal, environmental, and recreational uses of waters in the City and in Lewisville Lake, adversely

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[48] *Id.*
[49] *Id.*
[50] See "Clear Creek WWTP" depicted in Exhibit "A" attached hereto. The City's ETJ is 0.12 miles from the proposed discharge.
[51] *See* TEX. LOC. GOV'T CODE §§ 42.001, 54.004, 212.003, 212.044, and 242.001.
[52] *See* TEX. WATER CODE § 26.081(a).
[53] *See* Exhibit "A" attached hereto.

affecting the City's efforts to manage stormwater, and increasing the cost of service to the City's customers.

The City contends that a contested case hearing is necessary to ensure that the Application and associated discharge will comply with state and federal law and will not negatively impact the City, its residents, its ETJ, and its neighbors. An evidentiary hearing with sworn testimony in front of a neutral fact finder is essential to ensure that the Application conforms with state and federal law.

V. ADDITION TO THE MAILING LIST AND CORRESPONDENCE

In accordance with Title 30, Chapter 55 of the Texas Administrative Code, please add the following contacts to your official mailing list for this matter:

Stephen Gay, General Manager of Water Utilities and Street Operations
City of Denton
901-A Texas Street
Denton, TX 76209
(940) 349-8086

Mack Reinwand, City Attorney
City of Denton
215 E. McKinney St.
Denton, TX 76201
(940) 349-8333

Please send all future correspondence to me using the address and telephone number provided above.

VI. CONCLUSION

Denton respectfully submits these comments for consideration by the Executive Director and requests a contested case hearing regarding this matter. The City may supplement and/or amend this Comment Letter based on additional information provided in the public meeting. For the reasons stated above in the City's comments, the Application does not meet the requirements for permit approval, the Application should be denied, and the proposed permit should not be granted.

If you have any questions or need any additional information, please feel free to contact me.

Sincerely,

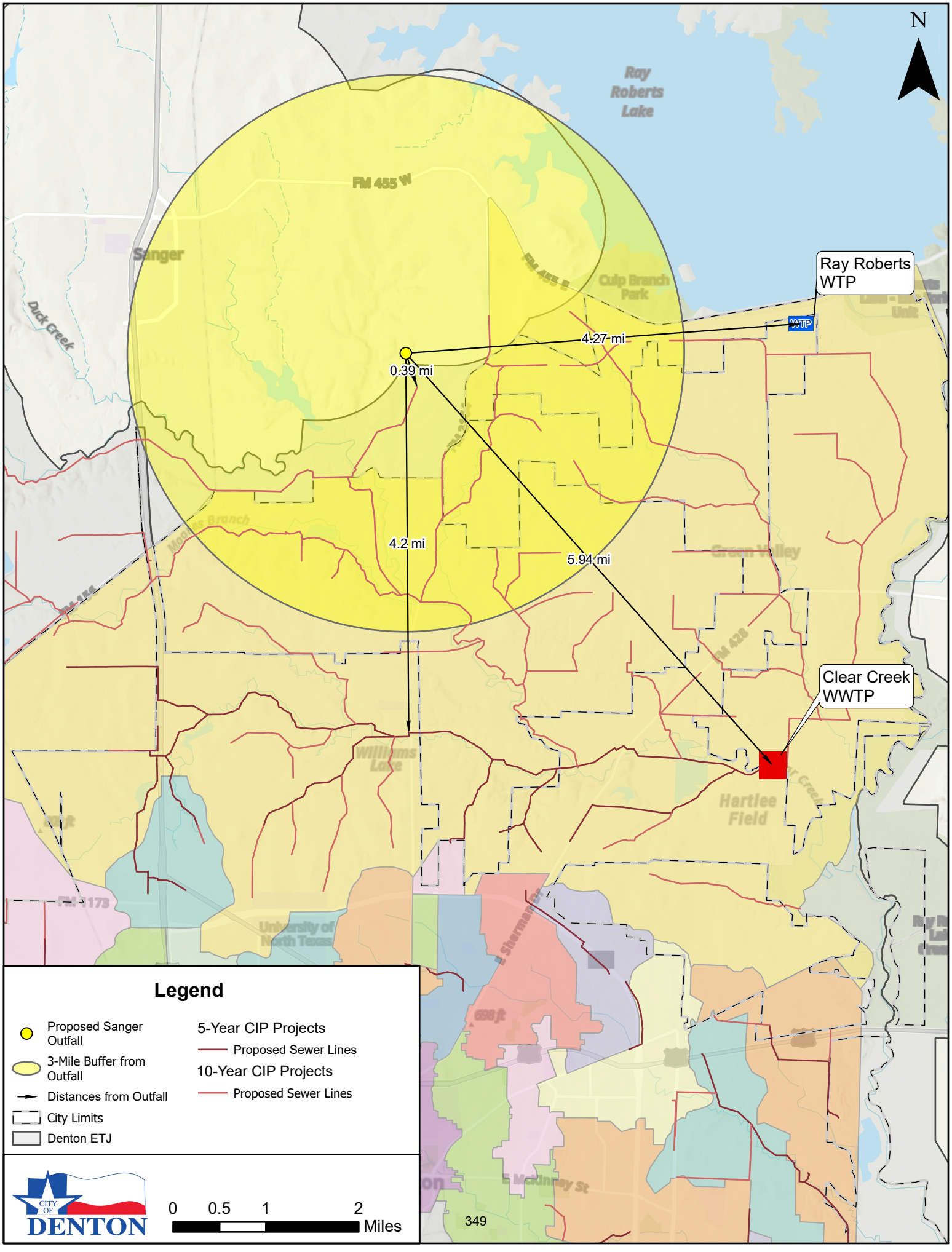
Stephen Gay
General Manager, Water Utilities and Street Operations

Copy: Sara Hensley, City Manager
Mack Reinwand, City Attorney

Enclosures

Exhibit A

Facility Map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Ray Roberts Lake
FM 455 W
Sanger
Duck Creek
Culp Branch Park
Ray Roberts WTP
WTP
4.27 mi
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4.2 mi
5.94 mi
Green Valley
FM 428
Clear Creek WWTP
Williams Lake
Hartlee Field
FM 1173
University of North Texas
E Sherman St
E McKinney St
698 ft
Legend
Proposed Sanger Outfall
3-Mile Buffer from Outfall
Distances from Outfall
City Limits
Denton ETJ
5-Year CIP Projects
Proposed Sewer Lines
10-Year CIP Projects
Proposed Sewer Lines
CITY OF DENTON
0 0.5 1 2
Miles

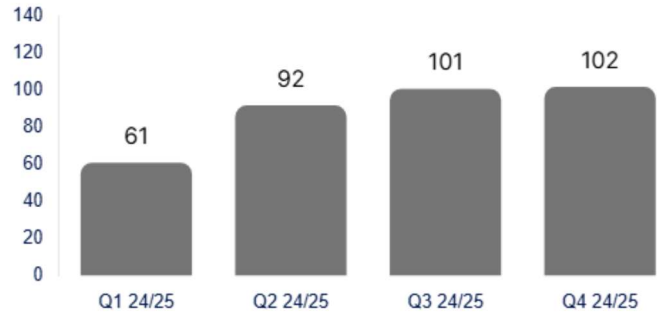
Friday Report - Council Requests

smartsheet

	Summary of Request or Item	Council Member Requestor	Date Received	Staff Assigned	Department	Comments	Status
1	School zone near Reeves Elementary	Mayor Pro Tem Rumohr	08/20/25	Farhan Butt	Development Services	Traffic audit will be complete by September 12	
2	No parking on Marietta Street near UNT	Mayor Pro Tem Rumohr	08/28/25	Farhan Butt	Development Services	Response will be ready by September 10	
3	Accident on Teasley near Summit Oaks	Mayor Hudspeth Council Member Holland	09/01/25	Farhan Butt	Development Services	Referred to staff.	
4	Audra Lane homelessness activity	Mayor Hudspeth	09/02/25	Jesse Kent, Jessica Robledo	Community Services Police	Referred to staff.	
5	Craftstrom plug ins	Council Member Beck	09/03/25	Antonio Puente	DME	Referred to staff.	
6	Board and commission transcripts	Council Member Beck	09/05/25	Kristi Fogle	CMO City Secretary's Office	Referred to staff.	
7	Construction behind Robson Ranch	Mayor Hudspeth	09/05/25	Scott McDonald	Development Services	Referred to staff.	
8	Easement on University Drive	Mayor Hudspeth	09/05/25				
9	Left turn from Bolivar to University Drive	Council Member Holland	08/09/25	Farhan Butt	Development Services	Response sent.	
10	Construction vehicles in Thistle Hill Estates	Council Member Holland	08/29/25	Scott McDonald, seth.garcia@cityofdenton.com	Capital Projects/Engineering/Public Works Development Services	Response sent.	
11	Hickory Creek Road completion	Council Member Holland	09/02/25	Seth Garcia	Capital Projects/Engineering/Public Works	Response sent.	
12	Group/boarding home regulations	Mayor Pro Tem Rumohr	09/02/25	Jesse Kent, Scott McDonald	Community Services Development Services	Response sent.	
13	Ranch Estates traffic concerns	Mayor Hudspeth	08/11/25	Farhan Butt	Development Services	Response sent.	

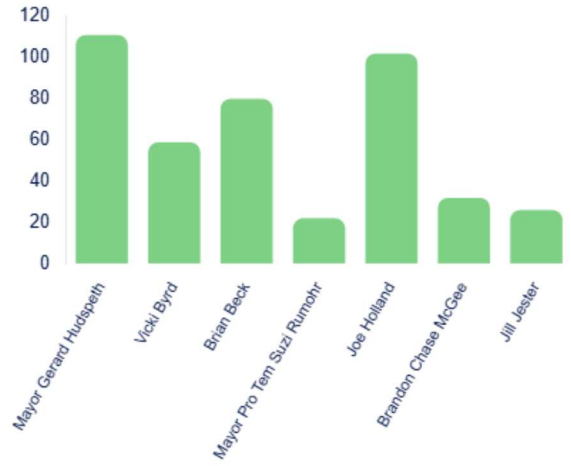
FY 24/25 Council Requests

Number of Requests Per Quarter

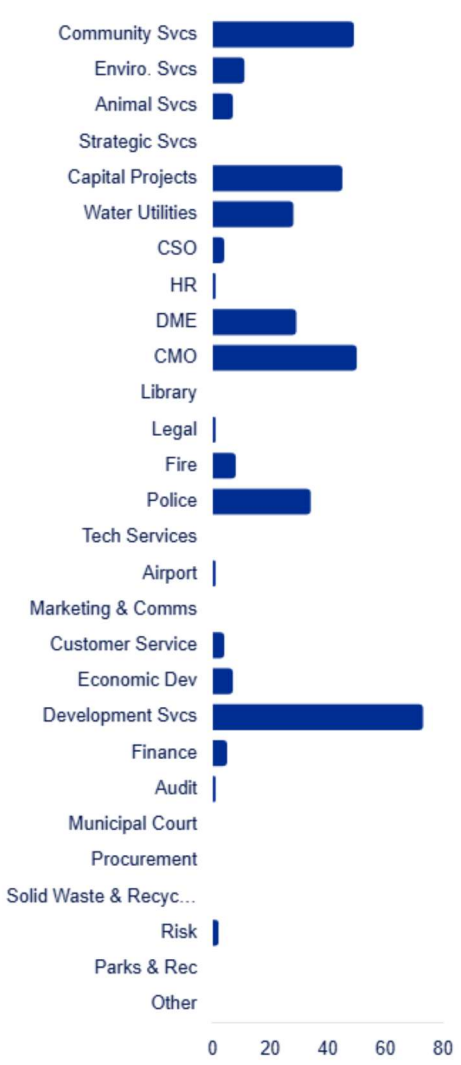


Please Note: the total number of requests per council member or department may not match, as several council members and/ or departments may be associated with a single request.

Total Requests Made by Council Member



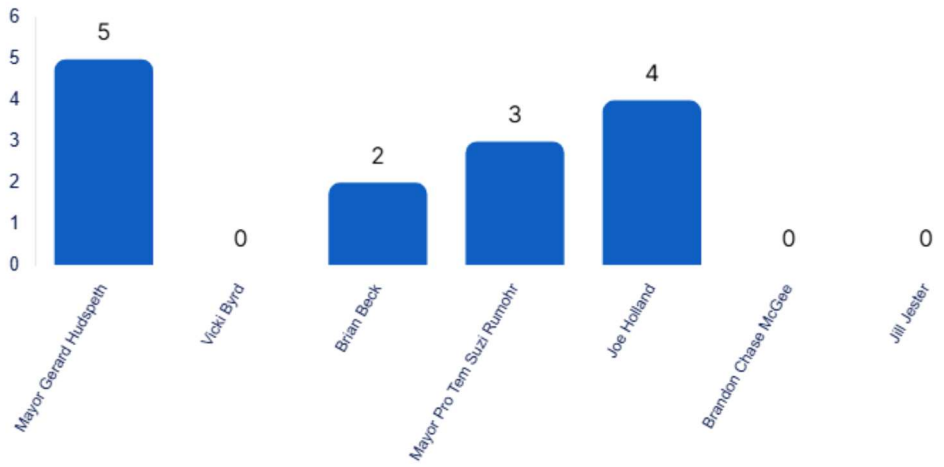
Requests by Department



Council Requests

10

Number of Pending Requests by Council Member



City of Denton

Meeting Calendar

City Hall
215 E. McKinney St.
Denton, Texas 76201
www.cityofdenton.com

Criteria : Begin Date: 9/8/2025, End Date: 12/12/2025

Date	Time	Meeting Body	Meeting Location
September 2025			
9/8/2025	3:00 PM	Development Code Review Committee	Development Services Center
9/8/2025	5:30 PM	Board of Ethics	CANCELLED
9/8/2025	5:30 PM	Historic Landmark Commission	Development Service Center
9/8/2025	5:30 PM	Library Board	North Branch Library
9/8/2025	6:00 PM	Parks, Recreation and Beautification Board	Civic Center Community Room
9/9/2025	2:00 PM	City Council	Council Work Session Room & Council Chambers
9/10/2025	10:00 AM	Animal Shelter Advisory Committee	Animal Services Training Room
9/10/2025	11:00 AM	Economic Development Partnership Board	Development Service Center
9/10/2025	3:00 PM	Airport Advisory Board	CANCELLED
9/10/2025	6:00 PM	Planning and Zoning Commission	Council Work Session Room & Council Chambers
9/11/2025	3:00 PM	Health & Building Standards Commission	Cancelled
9/12/2025	12:00 PM	Community Services Advisory Committee	Development Service Center
9/15/2025	9:00 AM	Public Utilities Board	Council Work Session Room
9/16/2025	9:00 AM	Committee on the Environment	Denton Civic Center Redbud Room
9/16/2025	2:00 PM	City Council	Council Work Session Room & Council Chambers
9/18/2025	3:00 PM	Committee on Persons with Disabilities	Development Service Center
9/22/2025	3:00 PM	Development Code Review Committee	Development Services Center
9/22/2025	5:30 PM	Zoning Board of Adjustment	Development Service Center
9/24/2025	10:00 AM	Mobility Committee	Council Work Session Room
9/24/2025	12:00 PM	Tax Increment Reinvestment Zone Number One Board	Development Service Center

Date	Time	Meeting Body	Meeting Location
9/24/2025	1:00 PM	Civil Service Commission	City Hall East Human Resources Training Room
9/24/2025	5:00 PM	Planning and Zoning Commission	Council Work Session Room & Council Chambers
9/26/2025	1:00 PM	Sustainability Framework Advisory Committee	City Council Work Session Room
9/29/2025	9:00 AM	Public Utilities Board	Council Work Session Room
9/30/2025	2:00 PM	City Council	Council Work Session Room & Council Chambers
October 2025			
10/2/2025	8:00 AM	Agenda Committee	Council Work Session Room
10/2/2025	8:30 AM	Downtown Economic Development Committee	Development Service Center
10/2/2025	4:00 PM	Public Art Committee	Civic Center Community Room
10/6/2025	6:00 PM	Parks, Recreation and Beautification Board	Civic Center Community Room
10/8/2025	11:00 AM	Economic Development Partnership Board	Development Service Center
10/8/2025	3:00 PM	Airport Advisory Board	Airport Terminal Meeting Room
10/8/2025	5:00 PM	Planning and Zoning Commission	Council Work Session Room & Council Chambers
10/9/2025	3:00 PM	Health & Building Standards Commission	Development Service Center
10/10/2025	12:00 PM	Community Services Advisory Committee	Development Service Center
10/13/2025	9:00 AM	Public Utilities Board	Council Work Session Room
10/13/2025	3:00 PM	Development Code Review Committee	Development Services Center
10/13/2025	5:30 PM	Board of Ethics	Council Work Session Room
10/13/2025	5:30 PM	Historic Landmark Commission	Development Service Center
10/13/2025	5:30 PM	Library Board	South Branch Library
10/14/2025	2:00 PM	City Council	Council Work Session Room & Council Chambers
10/21/2025	12:00 PM	City Council	Development Services Training Center & Council Chambers

Date	Time	Meeting Body	Meeting Location
10/21/2025	2:00 PM	City Council	Council Work Session Room & Council Chambers
10/22/2025		Civil Service Commission	City Hall East Human Resources Training Room
10/22/2025	5:00 PM	Planning and Zoning Commission	Council Work Session Room & Council Chambers
10/24/2025	9:00 AM	Community Partnership Committee	City Council Work Session Room
10/24/2025	1:00 PM	Sustainability Framework Advisory Committee	City Council Work Session Room
10/27/2025	9:00 AM	Public Utilities Board	Council Work Session Room
10/27/2025	3:00 PM	Development Code Review Committee	Development Services Center
10/27/2025	5:30 PM	Zoning Board of Adjustment	Development Service Center
10/29/2025	10:00 AM	Mobility Committee	Council Work Session Room

November 2025

11/3/2025	6:00 PM	Parks, Recreation and Beautification Board	Civic Center Community Room
11/6/2025	8:00 AM	Agenda Committee	Council Work Session Room
11/10/2025	5:30 PM	Board of Ethics	Council Work Session Room
11/10/2025	5:30 PM	Historic Landmark Commission	Development Service Center
11/10/2025	5:30 PM	Library Board	Emily Fowler Central Library
11/12/2025	10:00 AM	Animal Shelter Advisory Committee	Animal Services Training Room
11/12/2025	11:00 AM	Economic Development Partnership Board	Development Service Center
11/12/2025	3:00 PM	Airport Advisory Board	Airport Terminal Meeting Room
11/13/2025	3:00 PM	Health & Building Standards Commission	Development Service Center
11/14/2025	12:00 PM	Community Services Advisory Committee	Civic Center at 321 E. McKinney St., Denton, TX, 76201 in the Community Room
11/14/2025	1:00 PM	Bond Oversight Committee	Development Service Center
11/17/2025	9:00 AM	Public Utilities Board	Council Work Session Room
11/17/2025	3:00 PM	Development Code Review Committee	Development Services Center
11/17/2025	5:30 PM	Zoning Board of Adjustment	Development Service Center
11/18/2025	2:00 PM	City Council	Council Work Session Room & Council Chambers

Date	Time	Meeting Body	Meeting Location
11/19/2025	10:00 AM	Mobility Committee	Council Work Session Room
11/19/2025	12:00 PM	Tax Increment Reinvestment Zone Number One Board	Development Service Center
11/19/2025	5:00 PM	Planning and Zoning Commission	Council Work Session Room & Council Chambers
11/20/2025	3:00 PM	Committee on Persons with Disabilities	Development Service Center
11/26/2025	1:00 PM	Civil Service Commission	City Hall East Human Resources Training Room

December 2025

12/1/2025	6:00 PM	Parks, Recreation and Beautification Board	Civic Center Community Room
12/2/2025	2:00 PM	City Council	Council Work Session Room & Council Chambers
12/4/2025	8:00 AM	Agenda Committee	Council Work Session Room
12/4/2025	8:30 AM	Downtown Economic Development Committee	Development Service Center
12/4/2025	4:00 PM	Public Art Committee	Civic Center Community Room
12/8/2025	3:00 PM	Development Code Review Committee	Development Services Center
12/8/2025	5:30 PM	Board of Ethics	Council Work Session Room
12/8/2025	5:30 PM	Historic Landmark Commission	Development Service Center
12/8/2025	5:30 PM	Library Board	North Branch Library
12/10/2025	11:00 AM	Economic Development Partnership Board	Development Service Center
12/10/2025	3:00 PM	Airport Advisory Board	Airport Terminal Meeting Room
12/11/2025	3:00 PM	Health & Building Standards Commission	Development Service Center
12/12/2025	9:00 AM	Community Partnership Committee	City Council Work Session Room
12/12/2025	12:00 PM	Community Services Advisory Committee	Development Service Center
12/12/2025	1:00 PM	Sustainability Framework Advisory Committee	City Council Work Session Room

Tentative Work Session Topics and Meeting Information
Updated: September 5, 2025

Meeting Date	Item	Legistar ID	Departments Involved	Type	Estimated Time
September 9 Work Session (@2:00 p.m.) Special Called Meeting (Upon conclusion of the Work Session)	A. Audit Plan	25-1536	**City Auditor's Office**	City Business	0:30
	B. Inclement Weather Policy	25-1366	**Community Services**	City Business	1:00
	C. Budget Update	25-1566	**Finance**	City Business	1:00
	D. Two Minute Pitch: Boards and commissions member term uniformity (CM Jester)	25-033	**City Manager's Office**	Council Request	0:30
	Closed Meeting Item(s):		**Legal (if any)**	City Business	0:30
				Total Est. Time:	3:30
	Other Major Items for Meeting:				
September 16 Work Session (@2:00 p.m.) Regular Meeting (@6:30 p.m.)	A. Water Master Plan	25-363	**Water**	City Business	0:45
	B. Resolution Declaring June as Pride Month	25-1624	**City Manager's Office**	City Business	0:45
	C. Two Minute Pitch:	25-034	**City Manager's Office**	Council Request	0:30
	Closed Meeting Item(s):		**Legal (if any)**	City Business	0:30
				Total Est. Time:	2:30
	Other Major Items for Meeting:				
September 30 Work Session (@2:00 p.m.) Special Called Meeting (Upon conclusion of the Work Session)	A. Audit of Parks Management and Planning	25-340	**Internal Audit**	City Business	0:30
	B. Capital Improvement Advisory Committee	25-1577	**Development Services**	City Business	0:45
	C. Utility Billing Programs Update	25-1363	**Customer Service/Water**	City Business	0:45
	D. Two Minute Pitch:	25-035	**City Manager's Office**	Council Request	0:30
	Closed Meeting Item(s):		**Legal (if any)**	City Business	0:30
				Total Est. Time:	3:00
	Other Major Items for Meeting:				
October 14 Work Session (@2:00 p.m.) Special Called Meeting (Upon conclusion of the Work Session)	A. Federal Legislative Update	TBD	**City Manager's Office**	City Business	1:00
	B. Animal Services Audit Follow-Up	25-1537	**Internal Audit**	City Business	0:30
	C. Animal Services Building Update	TBD	**City Manager's Office**	City Business	1:00
	D. Two Minute Pitch:	25-036	**City Manager's Office**	Council Request	0:30
	Closed Meeting Item(s):		**Legal (if any)**	City Business	0:30
				Total Est. Time:	3:30
	Other Major Items for Meeting:				
October 21 Special Called Joint Meeting with Denton ISD (@12:00 p.m.)	A. City of Denton road construction update	25-1593	**Capital Projects**	City Business	0:30
	B. Denton ISD tax election	25-1594	**Denton ISD**	DISD Business	0:30
	C. Public hearing on property	25-1595	**City Manager's Office**	City Business	0:30
	Closed Meeting Item(s):		**Legal (if any)**	City Business	0:30
				Total Est. Time:	2:00
	Other Major Items for Meeting:				
October 21 Work Session (@2:00 p.m.) Regular Meeting (@6:30 p.m.)	A. Craver Ranch MMD	25-1589	**Development Services**	City Business	1:00
	B. Employee Benefit Plan Changes for 2026	25-1651	**Human Resources**	City Business	0:30
	D. Two Minute Pitch:	25-037	**City Manager's Office**	Council Request	0:30
	Closed Meeting Item(s):		**Legal (if any)**	City Business	0:30
				Total Est. Time:	2:30
	Other Major Items for Meeting:				
November 18 Work Session (@2:00 p.m.) Special Called Meeting (Upon conclusion of the Work Session)	A. Work Plan for Streets and Drainage	25-1625	**Water Utilities & Street Ops**	City Business	1:00
	B. Two Minute Pitch:	25-038	**City Manager's Office**	Council Request	0:30
	Closed Meeting Item(s):		**Legal (if any)**	City Business	0:30
				Total Est. Time:	2:00
	Other Major Items for Meeting:				
December 2 Work Session (@2:00 p.m.) Regular Meeting (@6:30 p.m.)	A. Aiport Master Plan	25-1543	**Airport**	City Business	1:00
	B. CVB Bylaws	TBD	**MarComm**	City Business	0:30
	C. Two Minute Pitch:	25-1031	**City Manager's Office**	Council Request	0:30
	Closed Meeting Item(s):		**Legal (if any)**	City Business	0:30
				Total Est. Time:	2:30
	Other Major Items for Meeting:				
December 16 Work Session (@2:00 p.m.) Regular Meeting (@6:30 p.m.)	A. Two Minute Pitch:	25-1033	**City Manager's Office**	Council Request	0:30
	Closed Meeting Item(s):		**Legal (if any)**	City Business	0:30
				Total Est. Time:	1:00
	Other Major Items for Meeting:				
Council Priorities and Significant Work Plan Items to be Scheduled	LIHTC	TBD	Community Services	City Business	0:30

	Item	Date Approved	Department	Next Step	Requestor
Approved Council Pitches to be Scheduled	Board of Ethics develop guidance for interactions with external partners	6/18/2024	**Internal Audit**	Work Session	CM Beck

**This is for planning purposes only. Dates are subject to change.*

1 Street Closure Report: Upcoming Closures

SCR Sept 8th - 14th

	Street/ Intersection	From	To	Closure Start Date	Closure End Date	Description	Department	Department Contact	Closure Type
1									

2 Street Closure Report: Current Closures

smartsheet

	Street/ Intersection	From	To	Closure Start Date	Closure End Date	Description	Department	Department Contact	Closure Type
1	Alice St	Sunset St	University Dr (US 380)	05/27/25	10/31/25	Utility installations and pavement replacement.	Engineering	Scott Fettig	Rolling Closure
2	Alice St	Panhandle St	Crescent St	05/02/25	12/05/25	Utility installations and pavement replacement.	Engineering	Megan Davidson	Full Closure
3	Amarillo St	Haynes St	Congress St	08/11/25	12/31/25	Utility installations and pavement replacement.	Engineering	Scott Fettig	Full Closure
4	Apollo Dr	Redstone Rd	Selene Dr	07/24/25	02/13/26	Utility installations and pavement replacement.	Engineering	Scott Fettig	Full Closure
5	Ave A	Maple St	Underwood St	09/02/25	09/30/25	Mabak installing utilities	Public Works Inspections	Stephany Trammell	Lane Closure
6	Bonnie Brae St S	Willowwood St	Parvin St	09/08/25	12/19/25	Installation of drainage infrastructure, embankment work in advance of street widening. (Access to Natl Wholesale & residents only)	Engineering	Robin Davis	Full Closure
7	Cactus Cir	Yucca Dr	(End of street) Cul de sac	04/28/25	09/26/25	Utilities and Pavement replacement	Engineering	Dante Hale	Full Closure
8	Carlton St	Aileen St	Malone St	07/23/25	09/19/25	Utility installations and pavement replacement.	Engineering	Scott Fettig	Full Closure
9	Congress St	Ponder St	Carroll Blvd	03/31/25	09/30/25	Utility installations and pavement replacement	Engineering	Megan Davidson	Rolling Closure
10	Cordell St	Coit St	Fulton St	06/30/25	09/26/25	Full road reconstruction	Engineering	Megan Davidson	Full Closure
11	Crescent St W	Aileen St	Malone St	05/21/25	09/12/25	Utility installations and pavement replacement.	Engineering	Megan Davidson	Full Closure
12	Denton St	Hickory St	Congress St	06/02/25	11/05/25	Utility installations and pavement replacement	Engineering	Megan Davidson	Full Closure
13	Eagle Dr	Ave C	Ave A	03/17/25	10/31/25	Using it or an entrance due to elevation changes in the jobsite it is the only way to get into the site	Public Works Inspections	Collin Cole	Lane Closure
14	Ector St	Cordell St	University Dr (US380)	06/30/25	09/19/25	Sewer Line Being installed, Manholes, pipe, paving	Public Works Inspections	Collin Cole	Full Closure
15	Egan St	Carroll Blvd	Bolivar St	05/07/25	09/12/25	Utility installations and pavement replacement.	Engineering	Megan Davidson	Full Closure
16	Fry St	Oak St	Hickory St	04/28/25	09/19/25	Mastec relocating gas lines	Public Works Inspections	Stephany Trammell	Rolling Closure
17	Hickory Creek Rd	Riverpass Dr	Country Club Rd (FM 1830)	03/13/23	12/31/26	Bridge Installation	Engineering	Tracy Beck	Full Closure
18	Hilltop Rd	Country Club Road (FM 1830)	@ intersection	05/27/25	09/30/25	Hilltop Road at Country Club Road will be reconstructed (new drainage, road, etc.) and new northbound right turn lane will be added to Country Club Road	Engineering	Tracy Beck	Full Closure
19	Hobson Ln	Forrestridge Dr	Country Club Rd	09/15/25	09/30/25	Striping new pavement on Hobson	Private Development	Gavin Petner	Full Closure
20	Hobson Ln	Forrestridge Dr	Country Club Rd	09/15/25	10/01/25	Signage and striping on Hobson Lane.	Public Works Inspections	Gavin Petner	Full Closure
21	Huisache St	Aspen Dr	Yucca Dr	04/09/25	09/26/25	Utilities and Pavement replacement	Engineering	Dante Hale	Rolling Closure
22	Jim Christal Rd	Masch Branch Rd	@ Intersection	03/14/25	09/12/25	Adding 2 Lanes E/W on Jim Christal: Adding a turn Lane on Masch Branch	Public Works Inspections	Kirk Winter	Lane Closure
23	Juno Ln	Atlas Dr	Stuart Dr	04/09/25	09/12/25	Utility installations and pavement replacement.	Engineering	Scott Fettig	Rolling Closure
24	Mistywood Ln	Robinwood Ln	Glenwood Ln	04/28/25	09/26/25	Construction Activity	Other	Sheldon Gatewood	Full Closure
25	Mockingbird Ln	Mingo Rd	University Dr (U.S. 380)	06/16/25	09/26/25	Bore work to install new sanitary sewer line.	Private Development	Zabdiel Mota	Lane Closure
26	Mounts Ave	Congress St W	Haynes St	08/01/25	11/01/25	Utility installations and pavement replacement	Engineering	Megan Davidson	Full Closure
27	Mulberry St	Welch St	Bernard St	11/29/24	10/01/25	Utility installations and pavement replacement.	Engineering	Scott Fettig	Full Closure
28	Normal St	Scripture St	Oak St	08/18/25	12/31/25	Utility installations and pavement replacement.	Engineering	Scott Fettig	Full Closure
29	Northridge St	Hinkle Dr	Bolivar St	04/16/25	04/20/26	Utilities and Pavement replacement	Engineering	Dante Hale	Rolling Closure
30	Oak St	Carroll Blvd	Fry St	04/21/25	09/19/25	Mastec relocating gas lines	Public Works Inspections	Stephany Trammell	Rolling Closure
31	Oak St	Welch St	Ave C	04/28/25	09/19/25	Mastec relocating gas lines	Public Works Inspections	Stephany Trammell	Rolling Closure

	Street/ Intersection	From	To	Closure Start Date	Closure End Date	Description	Department	Department Contact	Closure Type
32	Ocean Dr	Atlantic Dr	Nautical Ln	04/14/25	09/15/25	Sanitary Sewer install/ paving repair	Private Development	Gavin Petner	Full Closure
33	Panhandle St (2525)	East Park Blvd	Bonnie Brae St	07/31/25	09/30/25	Paving driveway approaches / sidewalks .	Private Development Public Works Inspections	Ryan Donaldson	Lane Closure
34	Pershing Dr	Atlas Dr	Stuart Rd	05/08/25	12/15/25	Utilities and Pavement replacement	Engineering	Dante Hale	Full Closure
35	Ponder Ave	Oak St W	Panhandle St	06/02/25	12/31/25	Utility installations and pavement replacement.	Engineering	Scott Fettig	Rolling Closure
36	Ranchman Blvd (3617)	Sundown Blvd	@ Intersection	09/01/25	09/30/25	ADA and Sidewalk Repair	Streets	Roy San Miguel	Lane Closure
37	Redstone Rd	Hercules Ln	Neptune Dr	05/05/25	06/12/26	Utilities and Pavement replacement	Engineering	Dante Hale	Full Closure
38	Robinwood Ln	Emerson Ln	Live Oak St	11/12/24	09/26/25	Full Road Reconstruction	Engineering	Sheldon Gatewood	Full Closure
39	Robinwood Ln	Live Oak St	Kayewood Dr	01/27/25	09/26/25	Road reconstruction (Milling and C/G Removal, Stabilization)	Engineering	Sheldon Gatewood	Full Closure
40	Scripture St	Bonnie Brae St	I-35 Service Rd	08/18/25	09/26/25	Sidewalk / ADA Repair	Streets	Roy San Miguel	Lane Closure
41	Scripture St	Jagoe St	Ponder St	03/04/25	10/17/25	Utility installations and pavement replacement.	Engineering	Scott Fettig	Full Closure
42	Selene Dr	Neptune Dr	Stuart Rd	06/04/25	11/28/25	Utility installations and pavement replacement.	Engineering	Scott Fettig	Full Closure
43	Sheraton Rd	Imperial Dr	Sun Valley Dr	08/11/25	12/12/25	Utilities and Pavement replacement	Engineering	Dante Hale	Full Closure
44	Sunnydale Ln	Sun Valley Dr	Kings Row	07/10/25	12/05/25	Utility installations and pavement replacement.	Engineering	Scott Fettig	Full Closure
45	Sunset St	University Dr W	Carroll Blvd	01/20/25	10/16/25	Utility installations and pavement replacement.	Engineering	Scott Fettig	Full Closure
46	Sunset St	Carroll Blvd	Bolivar St	07/07/25	10/17/25	Utility installations and pavement replacement.	Engineering	Scott Fettig	Full Closure
47	Trinity Rd S	McKinney St E	Mary Ln	06/09/25	09/19/25	Force Main Waterline being installed, staging area and line install. Road closed to through traffic	Public Works Inspections	Collin Cole	Full Closure
48	Unicorn Lake Blvd	State School Rd	Shoreline Dr	07/03/25	12/30/25	Sanitary sewer connection and paving repair	Private Development	Gavin Petner	Lane Closure
49	Union Cir (in entirety)	Chestnut St	Prairie St	05/12/25	10/01/25	Utility installations and pavement replacement.	Engineering	Megan Davidson	Full Closure
50	Walt Parker Dr	Bonnie Brae St	Tennis/Soccer Complex parking lot entrance	09/02/25	09/12/25	Paving Improvements on Walt Parker at the Bonnie Brae Intersection (NO ACCESS to Walt Parker from Bonnie Brae - ACCESS WALT PARKER via NORTH TEXAS BLVD, then route behind Stadium parking lot back to Walt Parker.))	Engineering	Robin Davis	Full Closure
51	Welch St	Eagle Dr	Hickory St	05/31/24	10/15/25	Utility installations and pavement replacement.	Engineering	Scott Fettig	Rolling Closure
52	Wind River Ln	Widgeon Ln	Meredith Ln	08/08/25	09/30/25	Emergency pond pumping per Watershed compliance order	Private Development	Gavin Petner	Lane Closure
53	Yellowstone Pl	Hercules Ln	Juno Ln	06/30/25	10/10/25	Utilities and Pavement replacement	Engineering	Dante Hale	Full Closure

3 Street Closure Report: Completed Closures

smartsheet

	Street/ Intersection	From	To	Closure Start Date	Closure End Date	Description	Department	Department Contact	Closure Type
1	Aileen St	Panhandle St	Cordell St	09/27/24	09/05/25	Utility installations and pavement replacement.	Engineering	Scott Fettig	Full Closure
2	Airport Rd (FM 1515)	I 35 E Service Rd	I 35 W Service Rd	07/30/25	08/18/25	Paving work by both City and TxDot contractors for the 35E, Bonnie Brae and Airport Road projects. (USE WESTERN BLVD)	Engineering	Robin Davis	Full Closure
3	Ave D	Chestnut St	Mulberry St	05/12/25	08/15/25	Utility installations and pavement replacement.	Engineering	Megan Davidson	Full Closure
4	Ave G	Prairie St	Louise St	03/13/25	09/01/25	Utility installations and pavement replacement	Engineering	Megan Davidson	Full Closure
5	Bonnie Brae St	Conquest Dr	North Lakes Park	07/07/25	08/21/25	Contractor will be demolishing the existing street intersection of Bonnie Brae and Riney Road. The Contractor will construct the new concrete street intersection. Contractor has built a temporary concrete pavement detour to allow traffic to keep moving north and south.	Engineering	Jesus Perez	Full Closure
6	Bonnie Brae St S	I 35 E	Walt Parker Dr	07/30/25	08/18/25	Paving work by both City and TxDot contractors for the 35E, Bonnie Brae and Airport Road projects.		Robin Davis	Full Closure
7	Brookside Dr (5700)	Trailridge Dr	@ intersection	07/21/25	08/15/25	Sidewalk Repair	Streets	Roy San Miguel	Lane Closure
8	Chestnut St	Ave C	Ave D	05/12/25	08/15/25	Utility installations and pavement replacement.	Engineering	Megan Davidson	Full Closure
9	Congress St W	Malone St	Bryan St	01/31/25	09/02/25	Utility installations and pavement replacement	Engineering	Megan Davidson	Full Closure
10	Fannin St	S Ave B	McCormick st	08/01/25	08/15/25	Utility work for PCM24-0012	Public Works Inspections	Alexander Cervantes	Lane Closure
11	Glenwood Dr	Kayewood Dr	Mistywood Ln	07/21/25	08/31/25	Drainage Cut across Glenwood to remove and install new Junction Box	Drainage	Sheldon Gatewood	Full Closure
12	Hercules Ln (East bound)	Redstone Rd	Stuart Rd	07/18/25	08/25/25	Offsite utility work for Landmark at Locust project	Public Works Inspections	Alexander Cervantes	Lane Closure
13	Hercules Ln (West bound)	Redstone Rd	Stuart Rd	07/21/25	08/25/25	Offsite utility work for Landmark at Locust project	Public Works Inspections	Alexander Cervantes	Lane Closure
14	Kings Row	Stuart Rd	Valley View Rd	08/12/25	08/13/25	Utilities and Pavement replacement	Engineering	Dante Hale	Full Closure
15	Kings Row	Sunnydale Ln	@ Intersection	09/02/25	09/05/25	Utility Work and pavement repairs	Engineering	Dante Hale	Full Closure
16	Longmeadow Ct	West (cul de sac)	Mack Dr.	08/18/25	08/22/25	Basefailure repairs	Streets	Roy San Miguel	Full Closure
17	Mulberry St	Elm St	Carroll Blvd	03/17/25	08/22/25	Water/Wastewater connections	Public Works Inspections	Stephany Trammell	Full Closure
18	Normal St	Oak St	Scripture St	05/08/25	08/29/25	Utility installations and pavement replacement.	Engineering	Megan Davidson	
19	Oak St E (109)	Austin St	@ intersection	05/19/25	08/22/25	ADA / Sidewalk Work at Intersection	Streets	Roy San Miguel	Lane Closure
20	Parvin St	Larkhall Ln	Bonnie Brae St	07/21/25	09/05/25	Installation of Drainage Infrastructure crossing Parvin near Bonnie Brae. NO ACCESS TO BONNIE BRAE FROM PARVIN - Use Willowwood	Engineering	Robin Davis	Full Closure
21	Precision Dr	Airport Rd	UNT Library Annex	04/01/25	08/28/25	Reconstruction	Engineering Other	Gio Pineiro	Full Closure
22	Riney Rd	Bonnie Brae St	Hardaway Rd	03/08/25	08/08/25	Contractor to install 12-inch waterline to provide water to the new DISD elementary school	Engineering	Jesus Perez	Full Closure
23	Seven Oaks Ln (7912)	Clear River Ln	@ Intersection	06/23/25	08/08/25	Sidewalk Repair	Streets	Roy San Miguel	Lane Closure
24	Sheraton Rd	Imperial Dr	@ Intersection	09/02/25	09/05/25	Utilities and Pavement replacement	Engineering	Dante Hale	Full Closure