



Vietnam Veterans Celebration

WEEKLY REPORT

APRIL 1, 2022

TO: MAYOR FLETCHER AND COUNCIL MEMBERS
FROM: BRYAN LANGLEY, CITY MANAGER

THE CITY OF
BURLESON
TEXAS

Weekly Report | April 1, 2022

I. Council Schedule

Meetings

Monday, April 4: Regular City Council Meeting, City Hall Council Chambers. 141 W. Renfro St., 5:30 p.m. The meeting will be conducted in the council chambers and is also available via live stream, <https://www.burlesontx.com/watchlive>

Reports & Presentations

April 4

- Receive a report, hold a discussion, and provide staff direction regarding the Chisholm Summit development. (Staff Presenter: Tony McIlwain, Director of Development Services)
- Receive a report, hold a discussion, and provide staff direction regarding redevelopment of 130 E. Renfro Street and E. Ellison Street pedestrian improvements. (Staff Presenter: Alex Philips, Director of Economic Development)
- Receive a report, hold a discussion, and provide staff direction regarding the Burleson West Transit Oriented Development (TOD) District. (Staff Presenter: Tony McIlwain, Director of Development Services)
- Receive a report, hold a discussion, and provide staff direction regarding the Comprehensive Plan and Midpoint 2020 update. (Staff Presenter: Tony McIlwain, Development Services Director)

II. General Information and Status Updates

A. **Quil Miller Creek and East Renfro Street Update**

In the fall of 2021, a resident brought a concern to the city council regarding Quil Miller Creek and E. Renfro Street. On December 13, 2021, staff presented an initial report of findings to the city council and stated the final analysis would be presented to the council in 2022. Staff has received the final analysis from Freese and Nichols, Inc. regarding Quil Miller Creek and E. Renfro Street. A summary is below, and the full reports are attached.

Quil Miller Drainage

The final analysis was in line with the initial assessment. Major improvements with significant costs would provide little relief to flooding issues. Three separate alternatives were investigated, and all three saw little relief to flooding issues, and none will prevent future flooding. At this time, the recommended strategy based on cost would be to look at advanced warning systems to alert residents of possible flooding and prevent them from crossing the roadway when flooded. View the full report on page 10.

E. Renfro Street

The final analysis was in line with the initial assessment. Improvements to this specific area would cause decreased flooding at this location but would cause flooding downstream. The analysis did recommend cleaning the ditches to increase capacity and replacing the culvert under the roadway with a slightly larger pipe size will help minimize flooding concerns. These recommendations will be completed next year. View the full report on page 24.

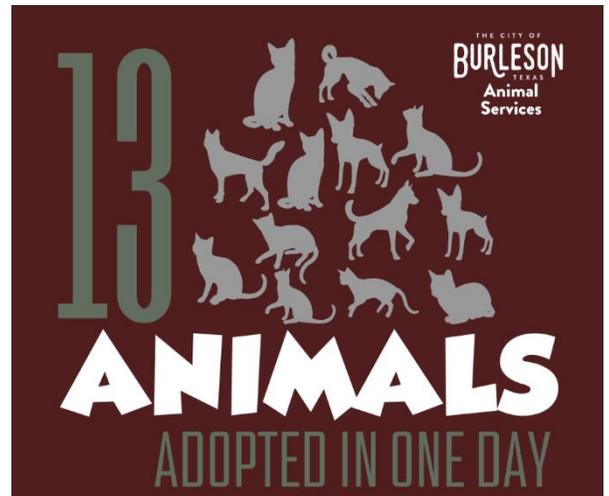
B. Burleson Drowning Coalition launches free swim lessons

In an effort to end childhood drowning in our community, the Burleson Drowning Coalition is once again offering free drowning prevention lessons for children 3 to 10-years-old. Registration opens April 1 at noon. Space is limited and lessons are first-come, first-served. [Learn more or register for the lessons.](#)



C. Helpful Honda Dealers partnered with Burleson Animal Shelter

The North Texas Helpful Honda Dealers partnered with Burleson Animal Shelter on March 30 to offer a free adoption day. Nine cats and five dogs found their forever homes during the event. A big thank you to North Texas Honda Dealers for partnering with animal services to make this event a success.



D. April Pool's Day

April Pools Day is an annual water safety awareness day (typically held on April 1) that focuses on the importance of water safety and drowning prevention education for both parents and children. The Burleson Fire Department and Burleson Drowning Coalition delivered goody bags with drowning prevention material to all kindergartners through second-graders at every elementary school in Burleson ISD and North Joshua Elementary and Caddo Grove Elementary in Joshua ISD (these two schools are within the city limits of Burleson). Below is a photo of Burleson Fire dropping off the goody bags at Frasier Elementary.



E. Outdoor Warning Siren Test

The monthly outdoor warning siren test is scheduled for noon Wednesday, April 6 (tests are held the first Wednesday of every month, if weather permits).

F. Event Recap

On Friday, March 25 Parks and Recreation hosted Food Truck Friday at Bailey Lake. [View photos from the event.](#)

On Saturday, March 26 Vietnam Veterans were celebrated at the city's Veterans' Memorial Plaza. [View photos from the event.](#)



G. Library Programs and News

A Day in the Life: Burleson

Calling all photographers! Submit your photos depicting A Day in the Life: Burleson for a chance to be included in a traveling photo exhibit. [More information.](#)

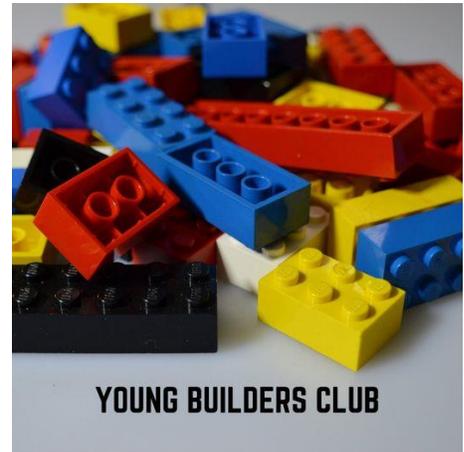
REACH Across Johnson County is partnering with Burleson Public Library to showcase, celebrate, and bring awareness to the many perspectives of daily life in Burleson through a photo gallery created from photo submissions through April 17, 2022. REACH Across Johnson County will print and frame photos (at no cost to the participant) for public display at the library. Selected participants will be asked if they would like their photo to be in a small traveling art show



within the town/county.

Young Builders Club

Join the Burleson Public Library for a fun morning of building at Young Builders Club on April 2 at 11 a.m. Kids can use the time to build their own projects.



H. Feel Good Friday

Keep Burleson Beautiful shared this great story with us.

“This is Everett, and he is doing a coin drive as part of the TAG (talented and gifted) project at school. This year’s theme is Agents of Change, and he is taking this literally by giving the money to Keep Burleson Beautiful, Inc. The picture below is Everett taking part in the city’s Fall Trash Bash.”

Great job, Everett. We are so proud of you!



III. Upcoming Road Construction/Closures

UPCOMING ROAD CONSTRUCTION / CLOSURES			
Projects & Limits	Current Status	Traffic Affected	Estimated Completion
Turkey Peak Ground Storage Tank	General Contractor is at both Turkey Peak	No current routes affected.	Winter 2022

Construction & Brushy Mound Tank Demolition at existing City Facilities	and Brushy Mound Sites. Minor work items are being completed at Turkey Peak.		
Irene/Gardens Safe Routes to School	Construction Underway	Sidewalk construction complete. Signage and stripping underway.	November 2022
SW Hulen Street between Greenridge Drive and Potomac Drive	Construction Underway	Daily closure on SW Hulen St between Greenridge Dr and Potomac Dr with a detour through the neighborhood.	April 2022
Mockingbird to CR 914A Sanitary Sewer From CR 914 and CR 1021	Construction started March 9	CR914 will be down to one lane between 9 a.m. to 4 p.m. daily. Both lanes will be open during overnight hours	Approximately three months, dependent on weather

IV. Events

- **Senior Center Resource and Health Fair**
Date: April 1
Time: 12 – 2 p.m.
Location: Burleson Senior Activity Center, 216 SW Johnson Ave
- **Light Up the Night**
Date: April 2
Time: 6 – 9 p.m.
Location: BRiCk, 550 SW Summercrest Blvd
[More information](#)
- **Aqua Egg Hunt**
Date: April 9
Time: 9 a.m. – 12 p.m.
Location: BRiCk, 550 NW Summercrest Blvd
[More information](#)
- **Easter Egg Hunt at Russell Farm**
Date: April 9
Time: 9 a.m.
Location: Russell Farm Art Center, 405 W CR 714
[More information](#)
- **Bunny Daze**
Date: April 9
Time: 12 – 3 p.m.
Location: Chisenhall Fields, 500 Chisenhall Park Ln
[More information](#)

- **Happy Birthday Burleson Public Library!**
 Date: April 9
 Time: 1 – 3 p.m.
 Location: Burleson Public Library, 248 SW Johnson Ave
[More information](#)
- **Household Hazardous Waste Event**
 Date: April 23
 Time: 9 – 11 a.m.
 Location: Municipal Service Center, 725 SE John Jones Dr
[More information](#)
- **Far Out Family Campout**
 Date: April 30 – May 1
 Time: 1 p.m. – 8 a.m.
 Location: Bailey Lake Park, 280 W Hidden Creek Pkwy
 Tickets: \$15/family of five
[More information](#)
- **Drug Take Back**
 Date: April 30
 Time: 10 a.m. – 2 p.m.
 Location: Walmart parking lot, 951 SW Wilshire Blvd.
[More information](#)
- **Red Chair Lecture: Tom Sale & Renata Lucia**
 Date: April 30
 Time: 11 a.m.
 Location: Russell Farm Art Center
- **Russell Farm Arbor Day**
 Date: April 30
 Time: 10 a.m. – 4 p.m.
 Location: Russell Farm Art Center, 405 W CR 714
 Info: Take a guided nature walk identifying birds and trees on the farm and enjoy a tree artist special guest.

V. **Attachments**

- BPD Monthly Most Wanted.....page 9
- Quil Miller Report.....page 10
- E. Renfro Report.....page 24

TOP 10 MOST WANTED

AS OF APRIL 1, 2022

The Burleson Police Department is seeking the community's help in locating these wanted subjects. If you have any information on their location, please contact **BPD** at **817-426-9903** or top10@burlesontx.com. If you would like to remain anonymous, you can call **Crime Stoppers** anytime 24 hours a day at **817-469-TIPS (8477)**. These subjects may be armed and dangerous. **DO NOT** attempt to apprehend these individuals yourself.



Michael BELLAH
AGG. ASSAULT



Mason CAULK
AGG. ASSAULT



Carrington CHOPP
AGG. ASSAULT



Juanrico GUEVARA
Fail to Reg. Sex Offd.



Yaheaven JOHNSON
Engag. In Org. Crim.



Andrew JOLLEY
ONLINE SOLICIT



Kerry MOORE
POSS CS



Raylund SHIMOZAKI
CREDIT CARD ABUSE



Dickie THORNTON
AGG. ASSAULT



Itzel VILLARREAL
CREDIT CARD ABUSE

The Burleson Police Department Top 10 Most Wanted is updated on the 1st of every month and available online at www.burlesontx.com/bpdmotwanted

TO: Michelle McCullough, P.E., CFM – City of Burleson

CC: Travis Attanasio, P.E., CFM – City of Burleson

FROM: Emily Sestak, P.E., CFM – FNI
Justin Oswald, P.E., CFM - FNI

SUBJECT: Drainage Evaluation of Quil Miller Creek near East Renfro Street

DATE: 3/30/2022

PROJECT: BUR21763 – Miscellaneous E Renfro Drainage Evaluations



FREESE AND NICHOLS, INC.
TEXAS REGISTERED
ENGINEERING FIRM
F-2144

Freese and Nichols, Inc. (FNI) is under contract with the City of Burleson to analyze the Quil Miller Creek from Hidden Creek Parkway to Fox Lane and provide recommendations regarding the ability to reduce flood hazards in this area. Residents of the study area have reported frequent road overtopping and property flooding, particularly near Bowden Circle. The purpose of this memo is to describe the methodology and results of the hydraulic analysis performed to determine the proposed conditions that would be required to remove structures from the floodplain and to improve capacity at bridge crossings. Three proposed alternatives extents are shown in **Figure 1**. The results described in this memo are based on high-level, conceptual modeling. Further analysis will be required if the City decides to pursue implementation of these concepts.

A site visit was conducted by FNI in October 2021 to observe and document existing conditions in the study area. A cross section of Quil Miller creek is shown in **Photo 1**, which shows ponding downstream of East Renfro Street bridge. In 2004, a 1D steady-state HEC-RAS model of Quil Miller Creek was developed as a Master Drainage Study by Freese and Nichols, Inc. for the City of Burleson. The model depicts the channel and bridge crossings from 2,000 feet upstream of Interstate Highway 35W to the confluence at Village Creek. FNI used this model as a basis for development of a revised existing 1D steady-state HEC-RAS model. For the revised model, cross sections were re-cut and georeferenced along the channel, and the geometry was updated to reflect 2019 LiDAR data. The Master Drainage Study model provided flows for the Existing and Ultimate 100-year storms, and flows were obtained from FIS Report 48251CV000A for the 100- and 10-year FEMA-defined storms.

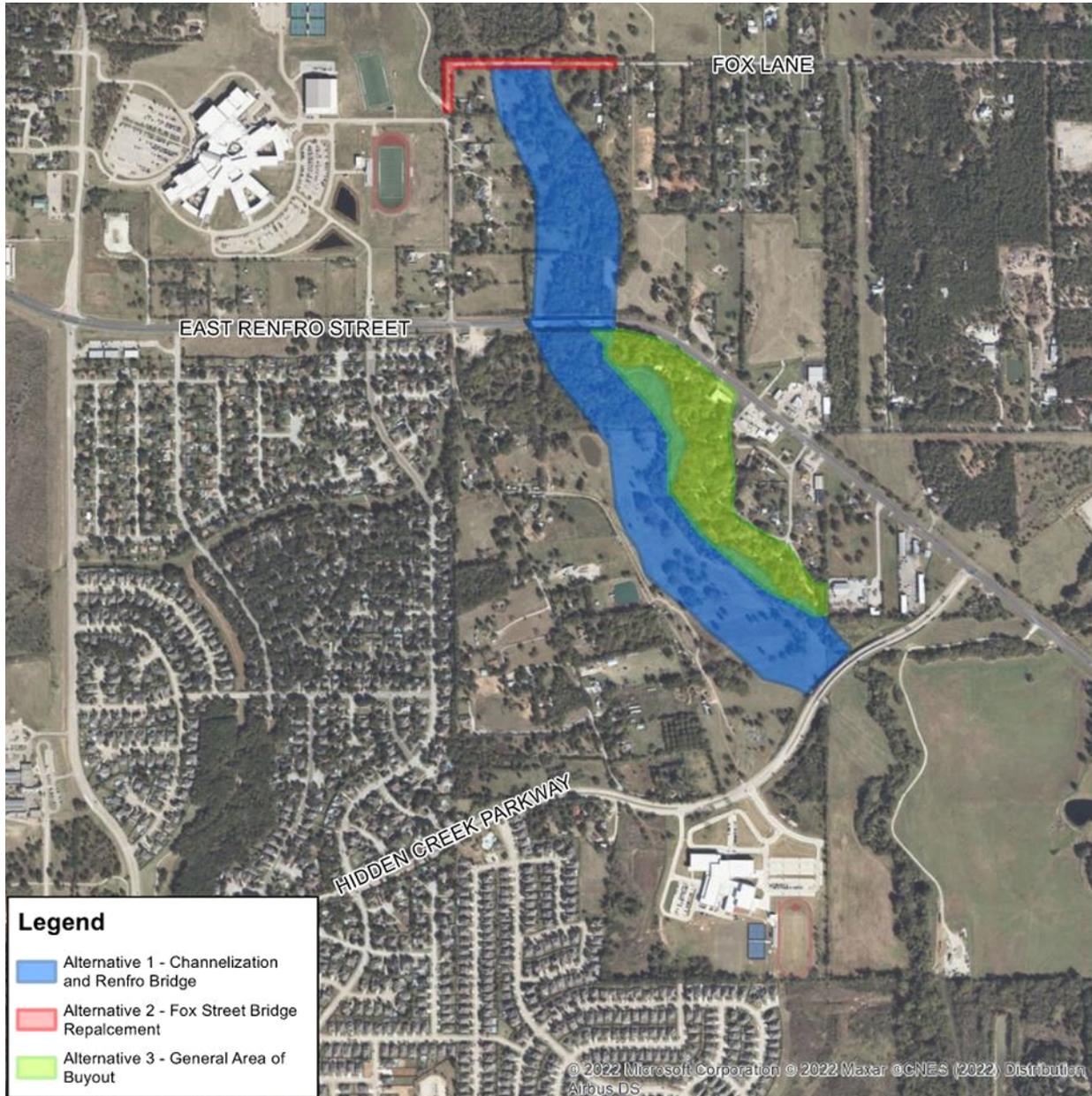


Figure 1 - Keymap Keymap of Alternatives 1-3

The area of analysis is shown along with a depiction of the existing flood conditions from the revised models in **Exhibit 1**. Several structures were recently permitted to City standards and are known to be protected from flooding which are delineated on this exhibit. Three alternatives were considered to address the concern of flooding impacts in the study area.



Photo 1 - Cross Section of Quil Miller Creek looking downstream from East Renfro Street Bridge.

Alternative 1 – Channelization and East Renfro Street Bridge Replacement

The first alternative consists of channelization improvements from Hidden Creek Parkway to Fox Lane, for the purpose of lowering the water surface elevation and removing structures from the 100-year floodplain. The proposed improvements consist of excavation in the existing channel to add a benching section for increased capacity. The benching is proposed to begin 2 feet above the existing channel flowline in order to remain outside of the ordinary high-water mark (OHWM) and varies from 80-feet to 325-feet in width. This typical section was identified to provide the maximum open channel capacity without disrupting adjacent dwelling structures. If disturbance of the OHWM or other regulated waters cannot be avoided this concept may not be feasible due to additional permitting and mitigation project costs. From Hidden Creek Parkway to Renfro Street, the benching is only shown on the western side of the channel due to limited space for widening the channel on the eastern side. From Renfro Street to Fox Lane, more space is available, and the benching is included on both sides of the channel. Significant tree removal would be expected to obtain the proposed section. The channel slopes are shown at a typical slope of 3:1 throughout the channel improvements. **Exhibits 2.1** and **2.2** map the results of

Alternative 1 with 100- and 10-year floodplain results, respectively. A typical section for the proposed channel grading is shown in **Figures 2 and 3**.

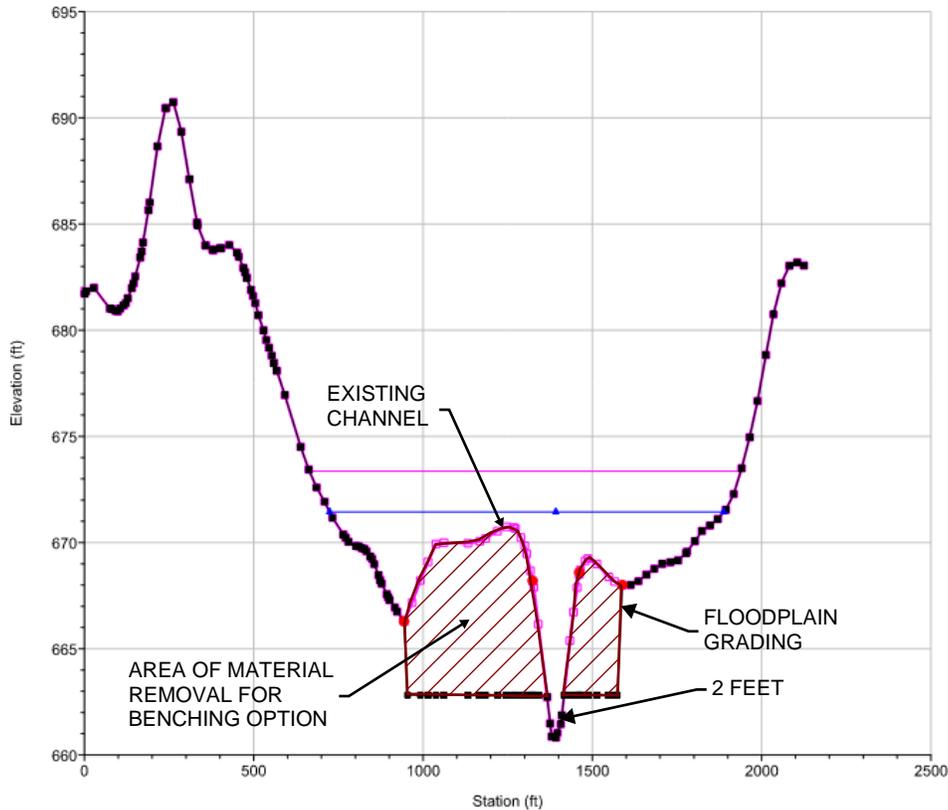


Figure 2 - Typical Channel Grading Section from Fox Lane to East Renfro Street.

In addition to the channel improvements, bridge improvements are shown at the Renfro Street bridge crossing to widen the existing dual bridge system with a combined opening of 215 feet wide to a 600-foot wide single opening bridge in proposed conditions. The road elevation is not proposed to change significantly with these road improvements. The depth of the bridge structure was modeled with 4-foot thickness to approximate a bridge constructed with longer spans than those of the existing bridges.

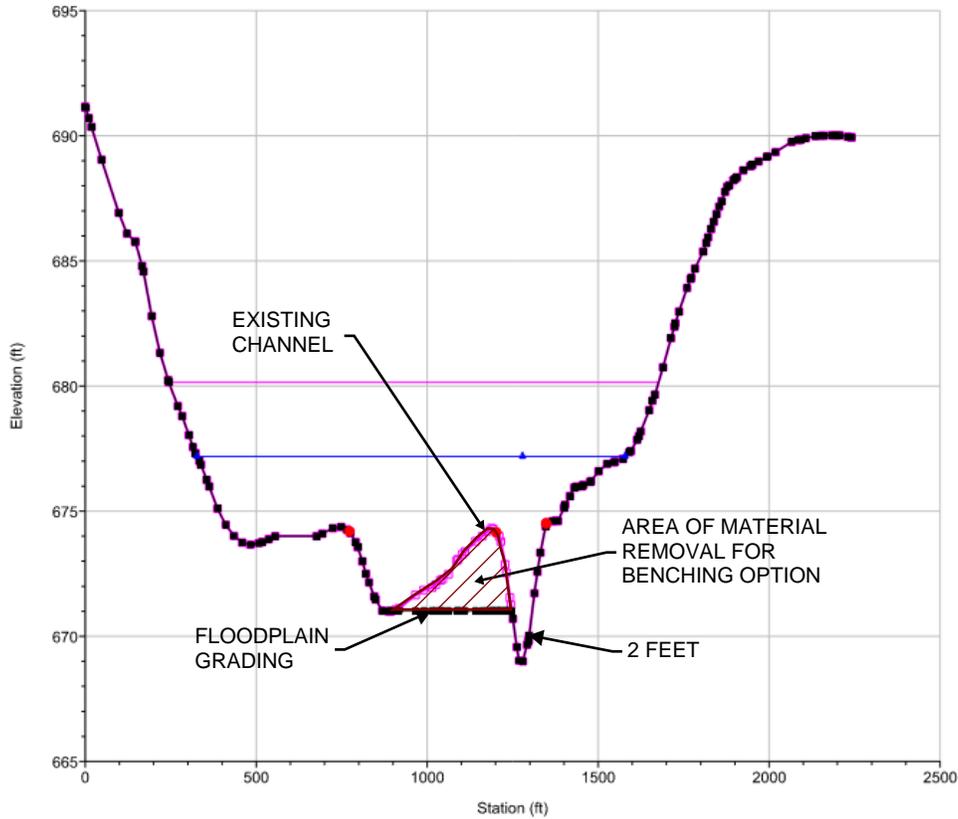


Figure 3 - Typical Channel Grading Section from East Renfro Street to East Hidden Creek Parkway.

Alternative 1 – Results Summary

- A total of 9 structures were removed from the 100-year floodplain
- **Table 1** below provides the reduction of flood depth by storm event.

Table 1 - Alternative 1 – Flood depth differences by storm event.

Bridge Location	10-Year FIS (Feet)	100-Year Existing (Feet)
Fox Lane	-0.29	-0.02
East Renfro Street	-2.62	-5.90
East Hidden Creek Parkway	-2.12	-1.90

- Improvements result in 100-Year protection for East Renfro Street.
- A budgeting cost is estimated at \$35-40 million.

Alternative 2 – Fox Street Bridge Replacement

The second alternative consists of bridge improvements at the Fox Lane bridge crossing, with the purpose of increasing the capacity to reduce overtopping and improve safety improvements. The bridge improvements would consist of widening the bridge opening from 70 feet in existing conditions to 300

feet in proposed conditions. As part of these improvements, the lowest point in the road is raised by approximately 4 feet to bring the road above the flood elevation. These improvements would provide 100-year flood protection for Fox Lane. Constructing the bridge to a lesser standard would be challenging due to the likelihood of causing a hydraulic impediment that would increase flooding upstream compared to the existing condition. The proposed bridge section is shown below in **Figure 3**.

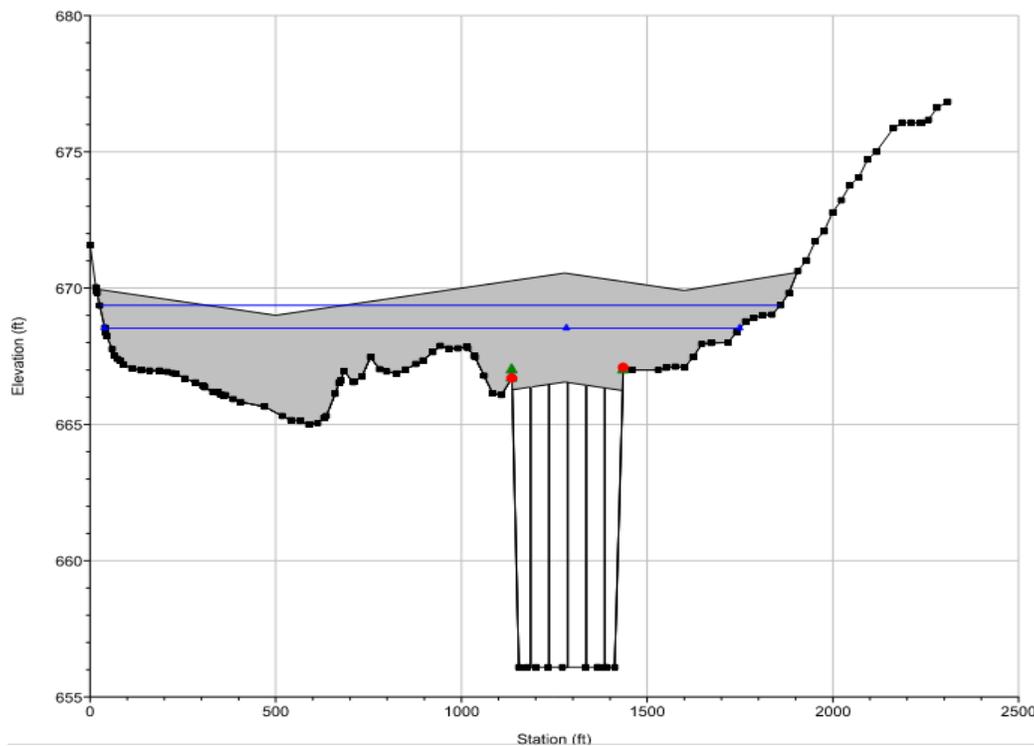


Figure 4 - Proposed 300-foot Alternative 2 bridge improvements at Fox Lane.

For the proposed bridge to connect back to the existing grade, additional road improvements will be needed for a total length of 2,000 feet. There are feasibility challenges with elevating this section of roadway. Establishing the new grade may require some fill and access issues for adjacent properties. Photos and measurements were taken at each bridge, and it was noted that severe erosion has occurred downstream of Fox Lane as shown in **Photo 2**. **Exhibit 3.1** and **3.2** map the results of Alternative 2 with 100- and 10-year floodplain results, respectively.



Photo 2 - Severe bank erosion observed along the outer bank just downstream of Fox Lane bridge.

Alternative 2 – Results Summary

- No structures were removed from the 100-year floodplain.
- Proposed embankment will raise roadway by approximately 4 feet.
- **Table 2** provides the reduction of flood depth by storm event.

Table 2 - Alternative 2 – Flood depth differences by storm event

Bridge Location	10-Year FIS (Feet)	100-Year Existing (Feet)
Fox Lane	-1.61	-0.84
East Renfro Street	-0.02	-0.02
East Hidden Creek Parkway	0.00	0.00

- Improvements result in 100-Year protection for Fox Lane.
- A budgeting cost is estimated at \$6-10 million.

Alternative 3 - Buyout

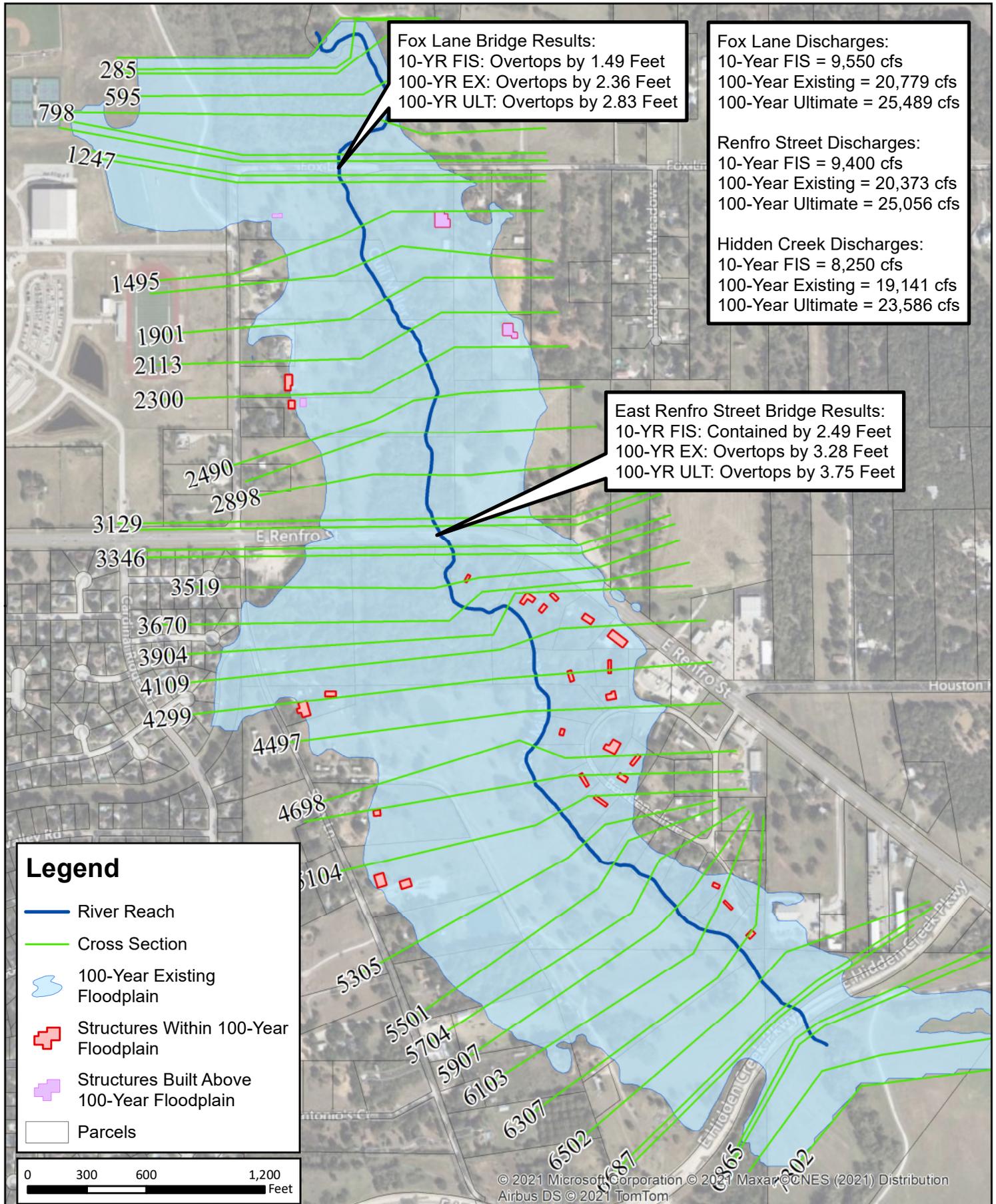
The third alternative consists of a buyout of structures within the existing floodplain. An analysis of the study area shows 29 total structures within the existing floodplain. Buildings were assigned into two separate categories; dwelling structures and out-buildings/shed structures. The Johnson County Appraisal District website was used as the resource to determine the value of each structure. The appraised values were increased by 50% to account for potential differences between market and appraised values. Additional cost was assumed for relocation expenses and other cost of acquiring the properties. This alternative does not reduce the flooding at the Fox Lane and East Renfro Street bridges.

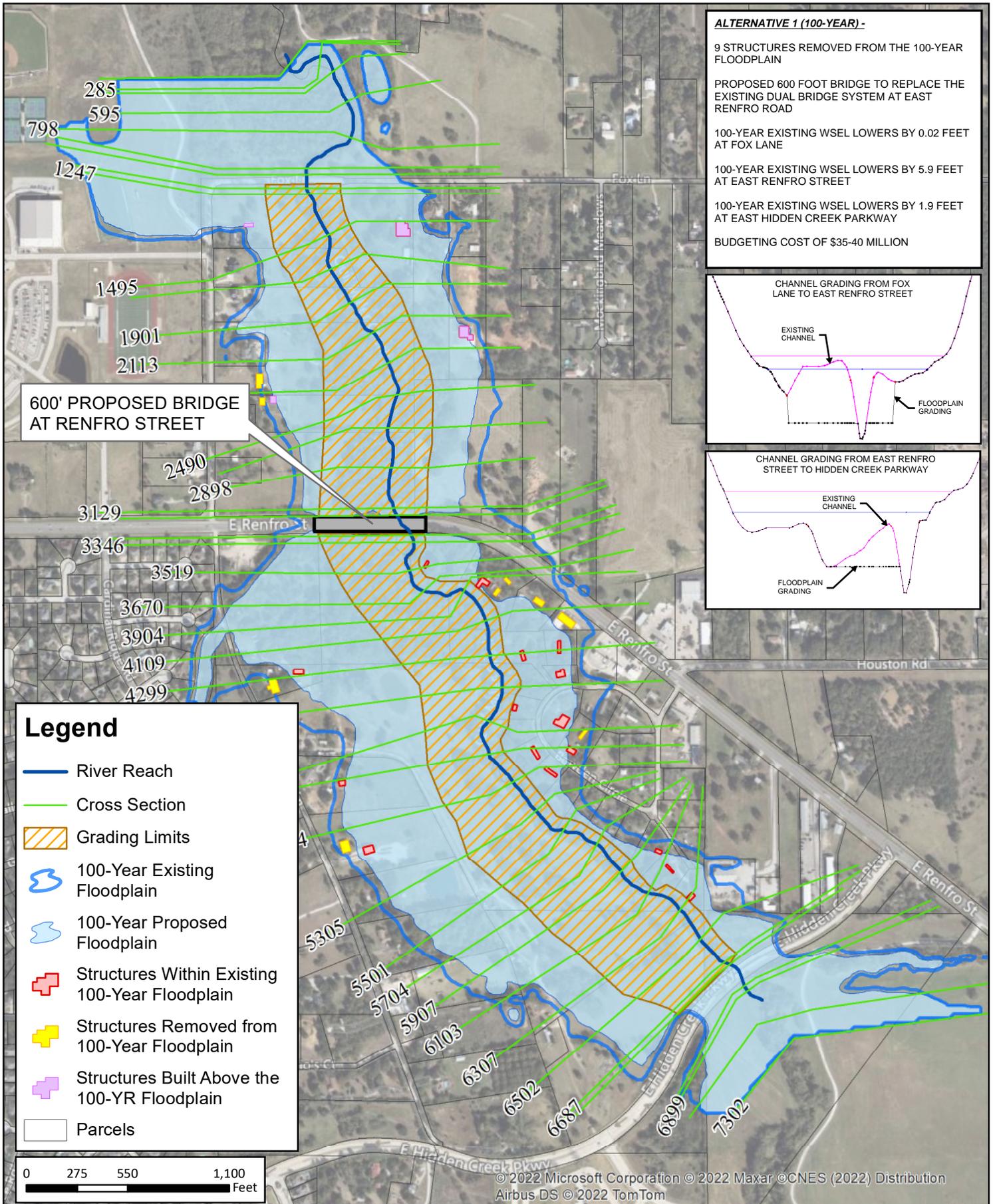
Exhibit 4 shows the structures within the 100-year floodplain that would be part of the buyout plan.

Alternative 3 – Results Summary

- 29 structures were removed from the 100-year floodplain.
- 4 structures are already constructed above the 100-year floodplain and would not be subject to any Hazard Reduction Mitigation Grant.
- No reduced flooding at Fox Lane and East Renfro Street bridges.
- A budgeting cost is estimated at \$5-10 million.

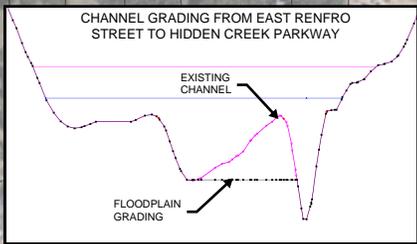
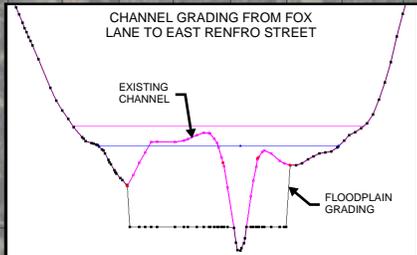
Based on the alternatives considered in this high-level conceptual analysis there would be significant cost to addressing flood hazards in the study area. These concepts could be further refined to more specifically identify project constraints and project cost through additional study if implementation was desired. In addition to the alternatives analyzed, the City could consider other strategic approaches that could reduce dangers to the public due to flooding in this area. A reduced voluntary buyout program to address the properties most affected by flooding is one such concept. A flood warning system could also be implemented to directly notify residents by telephone, text, or other means of flood conditions that may affect them. The City's existing notification and warning systems may be capable of providing this warning. In addition, Public Works has an on-going initiative to perform detailed studies of the creeks across the city. It is expected that large scale improvements that will provide a regional benefit will be evaluated during the study of Quil Miller Creek in this future study.





ALTERNATIVE 1 (100-YEAR) -

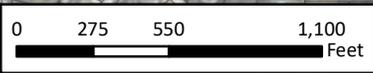
- 9 STRUCTURES REMOVED FROM THE 100-YEAR FLOODPLAIN
- PROPOSED 600 FOOT BRIDGE TO REPLACE THE EXISTING DUAL BRIDGE SYSTEM AT EAST RENFRO ROAD
- 100-YEAR EXISTING WSEL LOWERS BY 0.02 FEET AT FOX LANE
- 100-YEAR EXISTING WSEL LOWERS BY 5.9 FEET AT EAST RENFRO STREET
- 100-YEAR EXISTING WSEL LOWERS BY 1.9 FEET AT EAST HIDDEN CREEK PARKWAY
- BUDGETING COST OF \$35-40 MILLION



600' PROPOSED BRIDGE AT RENFRO STREET

Legend

- River Reach
- Cross Section
- Grading Limits
- 100-Year Existing Floodplain
- 100-Year Proposed Floodplain
- + Structures Within Existing 100-Year Floodplain
- + Structures Removed from 100-Year Floodplain
- + Structures Built Above the 100-YR Floodplain
- Parcels



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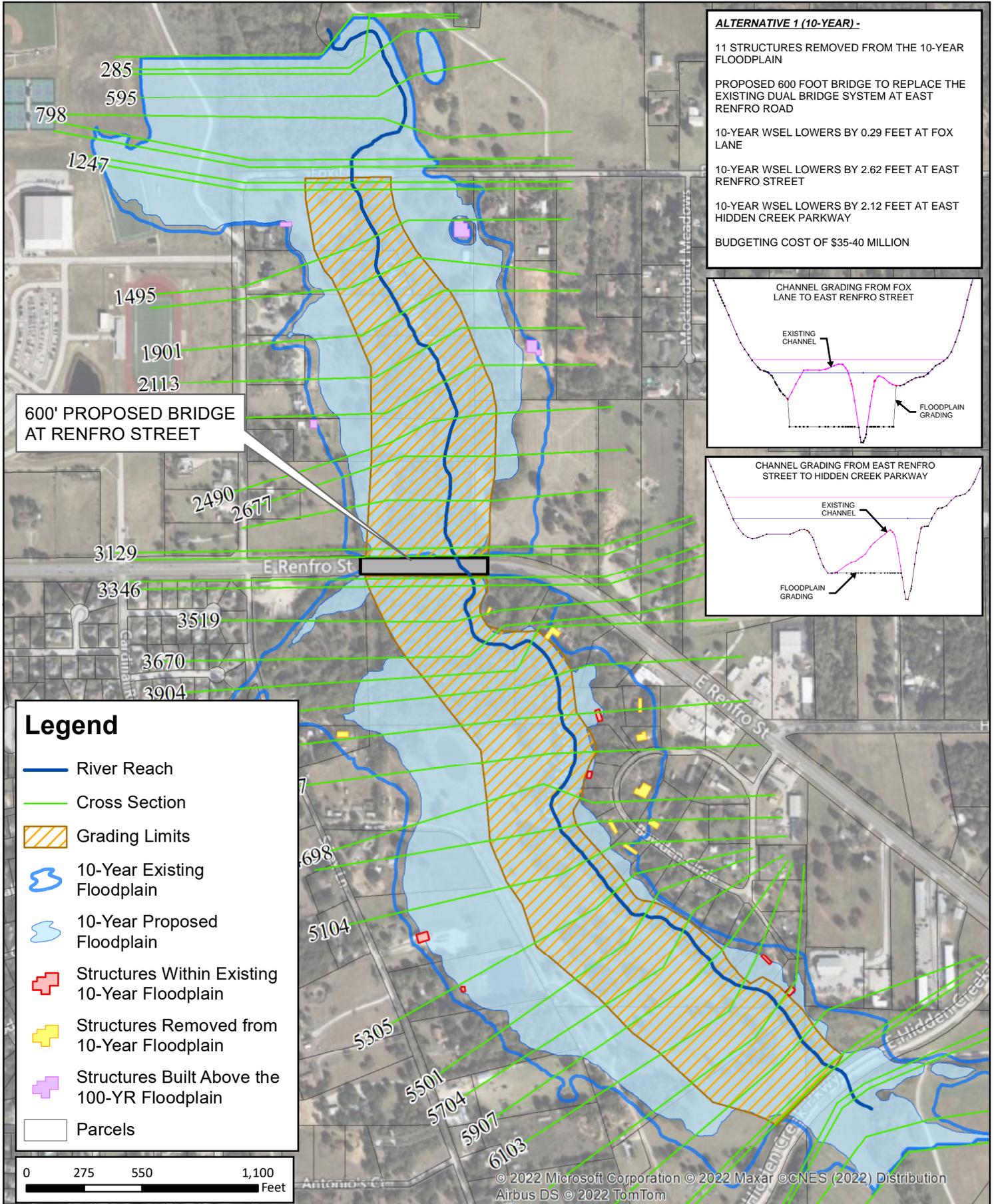


Quil Miller Creek Alt 1 - 100-Year Results

Channelization
Misc E Renfro Drainage Evaluations

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FILE	2_QuilMiller_Alt1_All_Grading										
DATE	3/30/2022										
SCALE	1:8,267										
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ALTERNATIVE 1 (10-YEAR) -

11 STRUCTURES REMOVED FROM THE 10-YEAR FLOODPLAIN

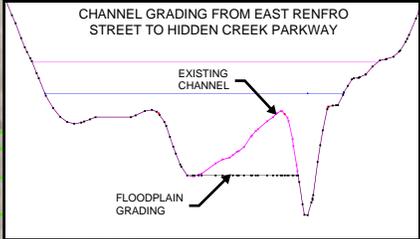
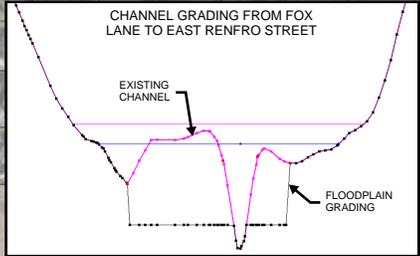
PROPOSED 600 FOOT BRIDGE TO REPLACE THE EXISTING DUAL BRIDGE SYSTEM AT EAST RENFRO ROAD

10-YEAR WSEL LOWERS BY 0.29 FEET AT FOX LANE

10-YEAR WSEL LOWERS BY 2.62 FEET AT EAST RENFRO STREET

10-YEAR WSEL LOWERS BY 2.12 FEET AT EAST HIDDEN CREEK PARKWAY

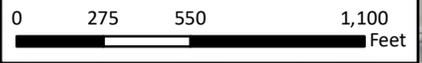
BUDGETING COST OF \$35-40 MILLION



600' PROPOSED BRIDGE AT RENFRO STREET

Legend

- River Reach
- Cross Section
- Grading Limits
- 10-Year Existing Floodplain
- 10-Year Proposed Floodplain
- + Structures Within Existing 10-Year Floodplain
- + Structures Removed from 10-Year Floodplain
- + Structures Built Above the 100-YR Floodplain
- Parcels



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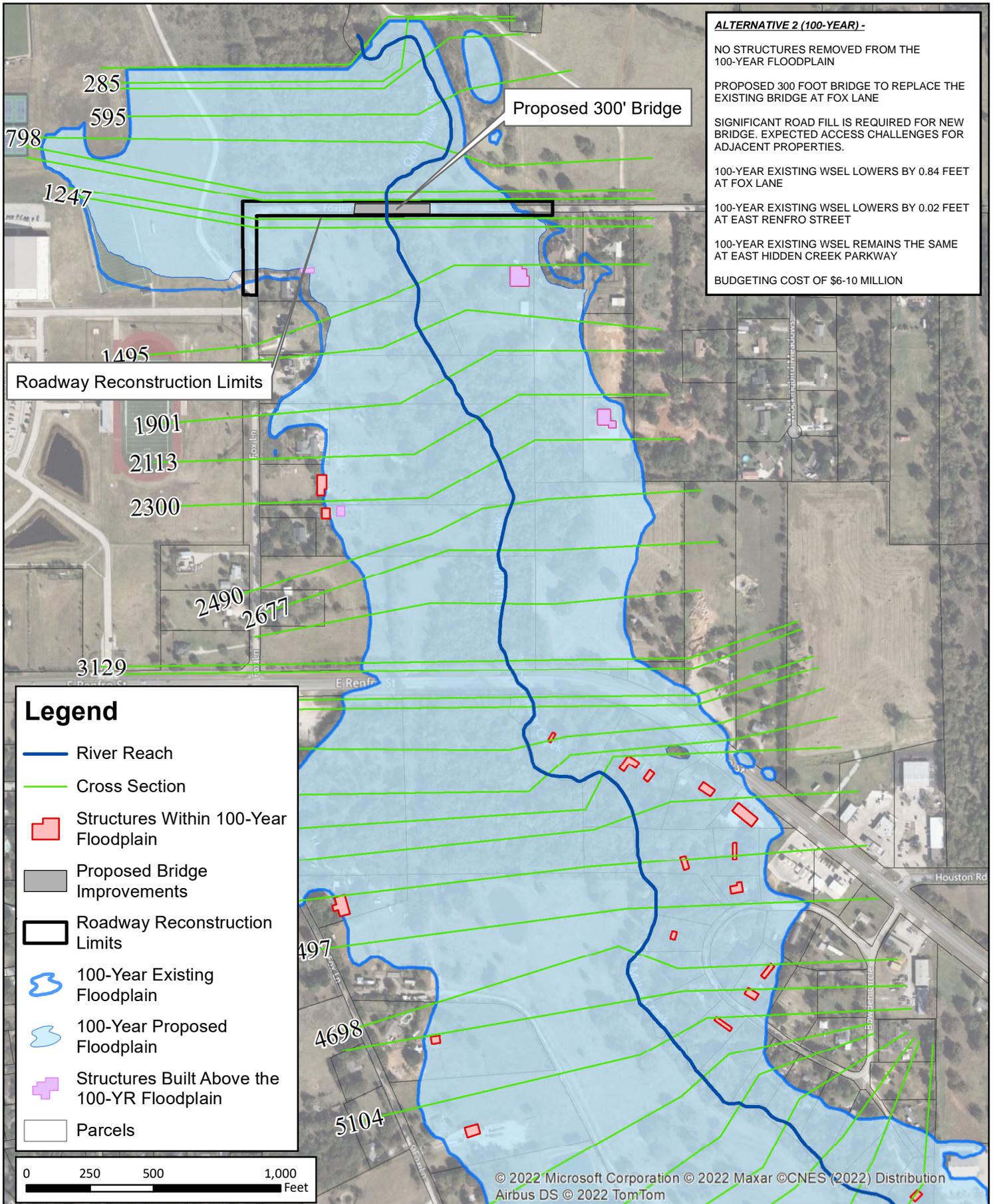


Quil Miller Creek Alt 1 - 10-Year Results

Channelization
 Misc E Renfro Drainage Evaluations

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DATE	3/30/2022
SCALE	1:7,252
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EXHIBIT
2.2



ALTERNATIVE 2 (100-YEAR) -

NO STRUCTURES REMOVED FROM THE 100-YEAR FLOODPLAIN

PROPOSED 300 FOOT BRIDGE TO REPLACE THE EXISTING BRIDGE AT FOX LANE

SIGNIFICANT ROAD FILL IS REQUIRED FOR NEW BRIDGE. EXPECTED ACCESS CHALLENGES FOR ADJACENT PROPERTIES.

100-YEAR EXISTING WSEL LOWERS BY 0.84 FEET AT FOX LANE

100-YEAR EXISTING WSEL LOWERS BY 0.02 FEET AT EAST RENFRO STREET

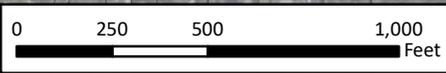
100-YEAR EXISTING WSEL REMAINS THE SAME AT EAST HIDDEN CREEK PARKWAY

BUDGETING COST OF \$6-10 MILLION

Roadway Reconstruction Limits

Proposed 300' Bridge

- Legend**
- River Reach
 - Cross Section
 - Structures Within 100-Year Floodplain
 - Proposed Bridge Improvements
 - Roadway Reconstruction Limits
 - 100-Year Existing Floodplain
 - 100-Year Proposed Floodplain
 - + Structures Built Above the 100-YR Floodplain
 - Parcels



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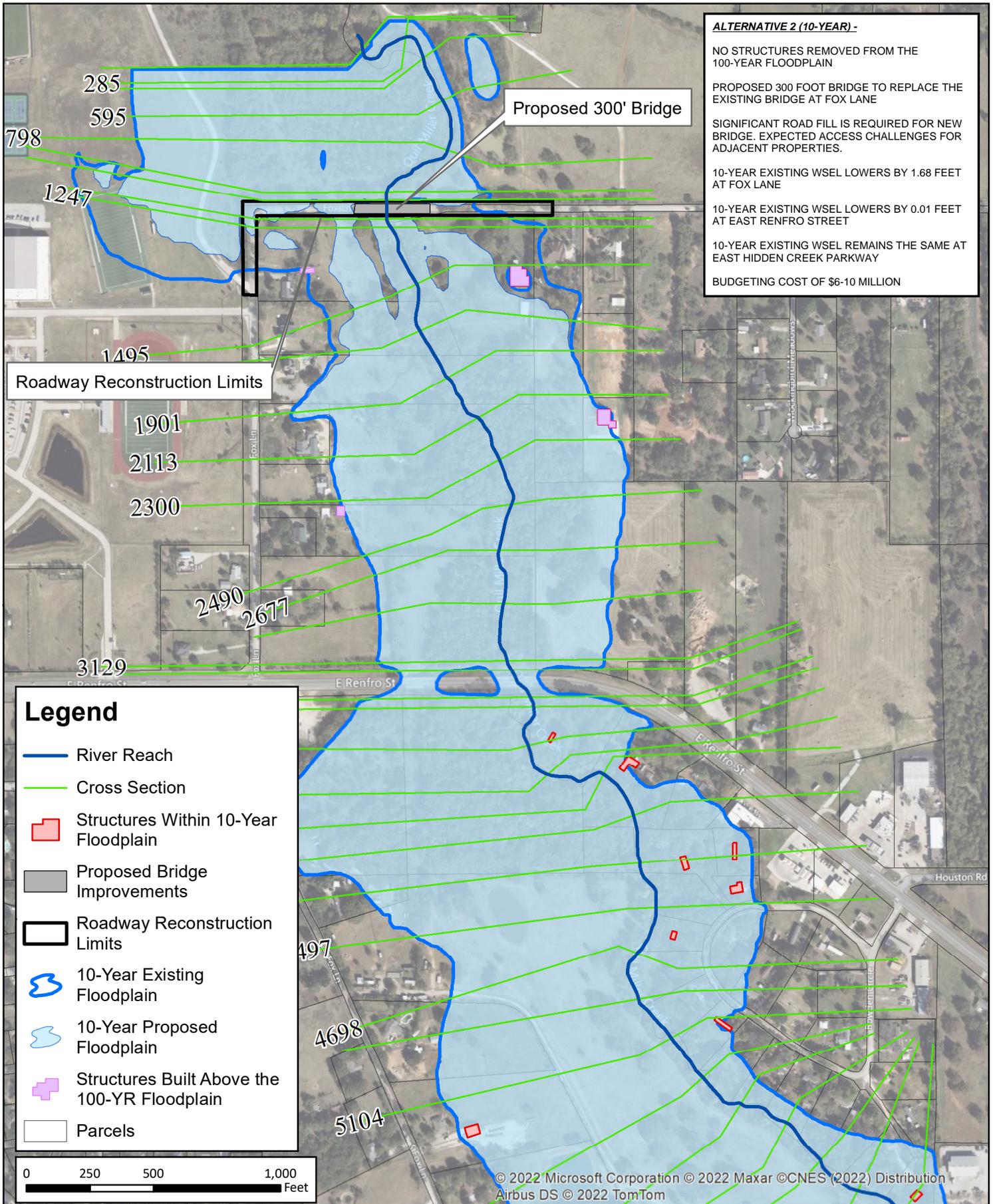
Quil Miller Creek Alt 2 - 100-Year Results

Fox Lane Improvements
 Misc E Renfro Drainage Evaluations

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DATE	3/30/2022
SCALE	1:6,000
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EXHIBIT
3.1

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ALTERNATIVE 2 (10-YEAR) -

NO STRUCTURES REMOVED FROM THE 100-YEAR FLOODPLAIN

PROPOSED 300 FOOT BRIDGE TO REPLACE THE EXISTING BRIDGE AT FOX LANE

SIGNIFICANT ROAD FILL IS REQUIRED FOR NEW BRIDGE. EXPECTED ACCESS CHALLENGES FOR ADJACENT PROPERTIES.

10-YEAR EXISTING WSEL LOWERS BY 1.68 FEET AT FOX LANE

10-YEAR EXISTING WSEL LOWERS BY 0.01 FEET AT EAST RENFRO STREET

10-YEAR EXISTING WSEL REMAINS THE SAME AT EAST HIDDEN CREEK PARKWAY

BUDGETING COST OF \$6-10 MILLION

Proposed 300' Bridge

Roadway Reconstruction Limits

Legend

- River Reach
- Cross Section
- Structures Within 10-Year Floodplain
- Proposed Bridge Improvements
- Roadway Reconstruction Limits
- ⬮ 10-Year Existing Floodplain
- ⬮ 10-Year Proposed Floodplain
- + Structures Built Above the 100-YR Floodplain
- Parcels



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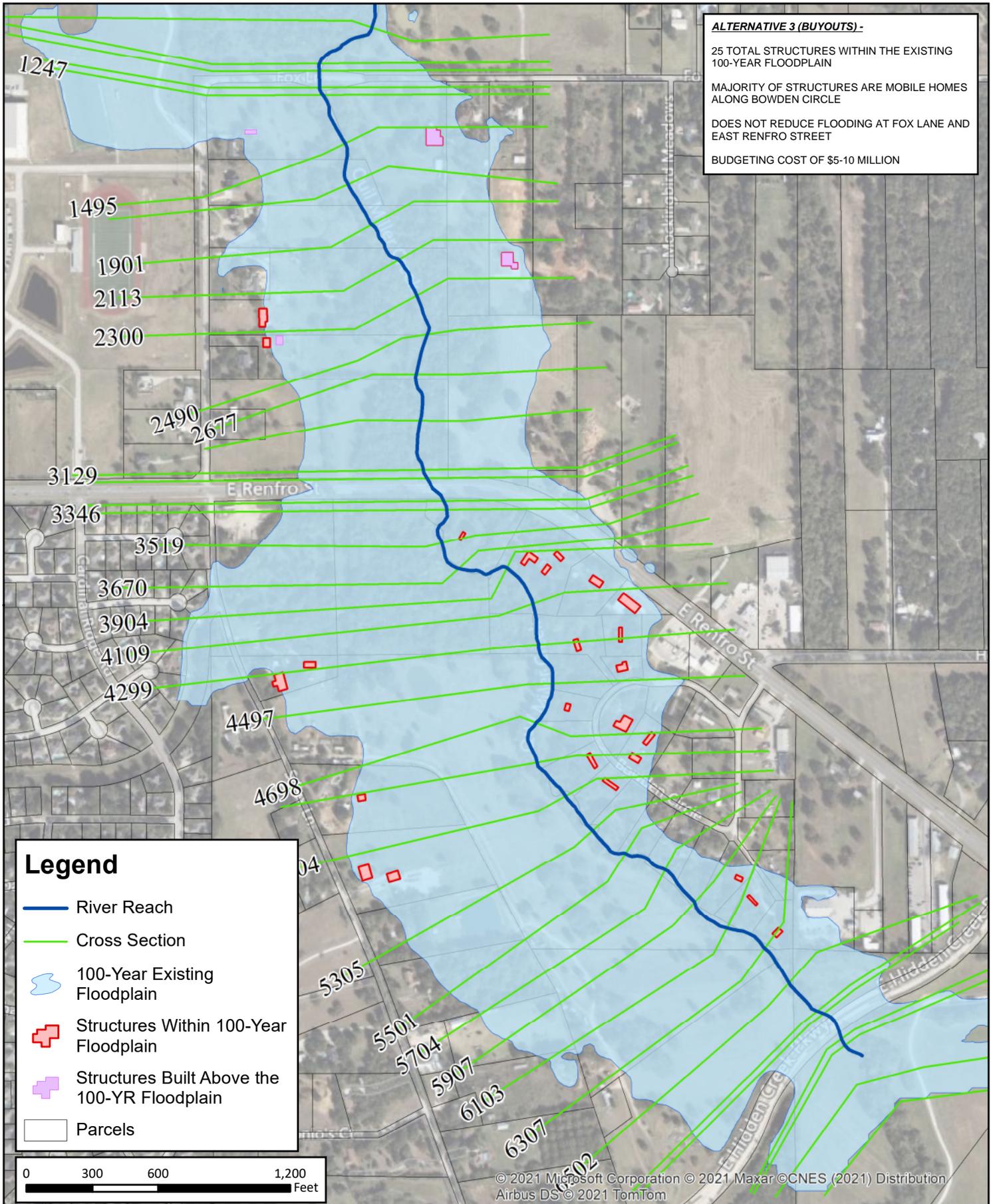


Quil Miller Creek Alt 2 - 10-Year Results

Fox Lane Improvements
 Misc E Renfro Drainage Evaluations

FN JOB NO	
FILE	3_QuilMiller_Alt2_300_FT_10_YR
DATE	3/30/2022
SCALE	1:6,000
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EXHIBIT
3.2



ALTERNATIVE 3 (BUYOUTS) -

25 TOTAL STRUCTURES WITHIN THE EXISTING 100-YEAR FLOODPLAIN

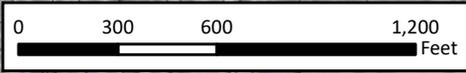
MAJORITY OF STRUCTURES ARE MOBILE HOMES ALONG BOWDEN CIRCLE

DOES NOT REDUCE FLOODING AT FOX LANE AND EAST RENFRO STREET

BUDGETING COST OF \$5-10 MILLION

Legend

- River Reach
- Cross Section
- █ 100-Year Existing Floodplain
- + Structures Within 100-Year Floodplain
- + Structures Built Above the 100-YR Floodplain
- Parcels



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Quil Miller Creek Alt 3 - Buyouts

Misc E Renfro Drainage Evaluations

FN JOB NO		EXHIBIT 4
FILE	4 QuilMiller_Alt3	
DATE	1/13/2022	
SCALE	1:6,933	
DRAFTED	gj	

MEMORANDUM



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TO: Travis Attanasio, P.E., CFM – City of Burleson

CC:

FROM: Emily Sestak, P.E., CFM – FNI
Justin Oswald, P.E., CFM - FNI

SUBJECT: Drainage Evaluation and Recommendations at E Renfro St Ditch Culvert Crossing and E Renfro St / CR 518 Culvert Crossing

DATE: 3/30/2022

PROJECT: BUR21763 – Miscellaneous E Renfro Drainage Evaluations



FREESE AND NICHOLS, INC.
TEXAS REGISTERED
ENGINEERING FIRM
F-2144

Freese and Nichols, Inc. (FNI) was tasked to analyze the drainage conditions at the existing bar ditch along the west side of E Renfro Street (County Road 600) and the culvert crossing across E Renfro Street, located approximately 550 feet north of the intersection of E Renfro Street and County Road 518. Residents in this area have reported concerns to the City regarding the capacity of the drainage system and buildup of water in the existing bar ditch. The drainage issues described were believed to be caused by the presence of overgrown vegetation within the ditch, and it was suggested that clearing out this vegetation could be a solution to the issues. The purpose of this memo is to describe the drainage analysis performed for the study area and to provide recommendations to improve the drainage conditions. The area of analysis of the ditch and culvert is shown in Exhibit 1.

A site visit was conducted by FNI in October 2021 to observe and document the existing conditions in the study area. It was noted during the site visit that despite the concerns raised by the residents, the majority of trees and vegetation are located outside of the main ditch and are unlikely to be the cause of the reported drainage issues. However, the ditch bottom does appear to have a buildup of soil and debris that would limit available conveyance. It was also noted that the existing culvert at the E Renfro Street crossing is completely blocked on both the upstream and downstream ends. Due to this buildup of silt at the opening, the culvert was unable to be measured and the exact size of the culvert was unknown. Based on the size of the upstream ditch and other culvert crossings in this area, a culvert size of 24" was assumed for the purpose of the capacity analysis described in this memo. The buried downstream end of the existing crossing at E Renfro St is shown in Figure 1. Based on the existing topography, any runoff that

does not pass through the culvert would continue flowing through the ditch along the road to the southeast.



Figure 1: Existing Buried Crossing at E Renfro Street

In order to determine the amount of runoff that reaches the study point at the E Renfro Street crossing, hydraulic calculations were performed using the Rational Method per the 2020 *iSWM Hydrologic Manual*. As part of these calculations, a drainage basin was delineated based on contours generated from 2019 LiDAR data. The drainage basin consists of residential lots and open fields and has an area of 18.8 acres, as shown in Exhibit 1. A time of concentration of 15 minutes and a runoff coefficient of 0.4 were assumed for the drainage basin based on a combination of the residential and open space parameters provided in the *Burleson Design Standards Manual*. Intensities were obtained from the TP-40 values provided in Appendix H in the *Burleson Design Standards Manual*. Based on these parameters, the resulting 100-year flow for the drainage basin was calculated at approximately 90 cfs.

The existing crossing is undersized for this amount of flow. Based on the estimated size of 24" for the culvert crossing, it is assumed that when the culvert operates at full capacity it can provide conveyance for approximately 30% of the calculated runoff. While this does not meet the City's design standards for culverts, it is a fairly common condition for non-urbanized drainage systems, and runoff that is not conveyed through the culvert continues to flow downstream through the ditch along the road to the southeast.

Recommendations were developed for improving drainage conditions at this crossing. Substantial improvements would be needed to provide 100-year capacity to meet City criteria. If the culvert were to be improved to an adequate size for the 100-year storm, grading downstream of the outfall would also be required to allow for the increased flow through the crossing. This increased flow would be redirected from the ditch along the western side of E Renfro, where it is currently conveyed, to the land east of E Renfro, where it would continue downstream to existing residential neighborhoods. These neighborhoods do not have a drainage system designed to receive this flow, and the increased runoff would worsen flooding conditions and potentially cause flooding of structures. Upgrading the E Renfro crossing to a 100-year capacity would therefore not be a feasible recommendation due to the adverse impacts on downstream conditions and significant costs.

Because full capacity improvements are not feasible, other courses of action were considered which are less intrusive but would still provide some drainage benefit. It is recommended to re-grade the vegetated section of the western ditch between the upstream and downstream driveway culverts and to clear the ditch bottom of the silt and debris that has accumulated. This will restore ditch capacity with minimal disturbance to the surrounding area. Additional vegetation clearing along the ditch is not recommended, as the vegetation is located past the limits of the main ditch and is not expected to have a significant impact on the ditch capacity.

In addition to the analysis of the E Renfro Street ditch and culvert crossing, FNI analyzed the culvert crossing at the intersection of E Renfro Street and County Road 518. Residents in this area have reported concerns to the City regarding the capacity of this culvert crossing and the upstream bar ditch along the western side of E Renfro Street. The area of analysis for this culvert is shown in Exhibit 2.

A site visit was conducted by FNI in October 2021 to observe and document the existing conditions in the study area. It was noted during the site visit that the existing 24" corrugated metal pipe (CMP) at the intersection of E Renfro Street and County Road 518 is in poor condition. The pipe appears partially damaged, and buildup of soil and debris in the ditch near the culvert opening limits the available flow capacity. The existing 24" pipe is shown in Figure 2.



Figure 2: Existing 24" CMP at Intersection of E Renfro Street and County Road 518

In order to determine the amount of runoff that reaches the study point at the intersection of E Renfro Street and County Road 518, hydrologic calculations were performed using the Rational Method per the 2020 *iSWM Hydrologic Manual*. As part of these calculations, a drainage basin was delineated based on contours generated from 2019 LiDAR data. The drainage basin consists of large residential lots with large yards and open spaces and has an area of 17.8 acres, as shown in Exhibit 2. A time of concentration of 15 minutes and a runoff coefficient of 0.4 were assumed for the drainage basin based on a combination of the residential and open space parameters provided in the *Burleson Design Standards Manual*. Intensities were obtained from the TP-40 values provided in Appendix H in the *Burleson Design Standards Manual*. Based on these parameters, the resulting 100-year flow for the drainage basin was calculated at approximately 85 cfs.

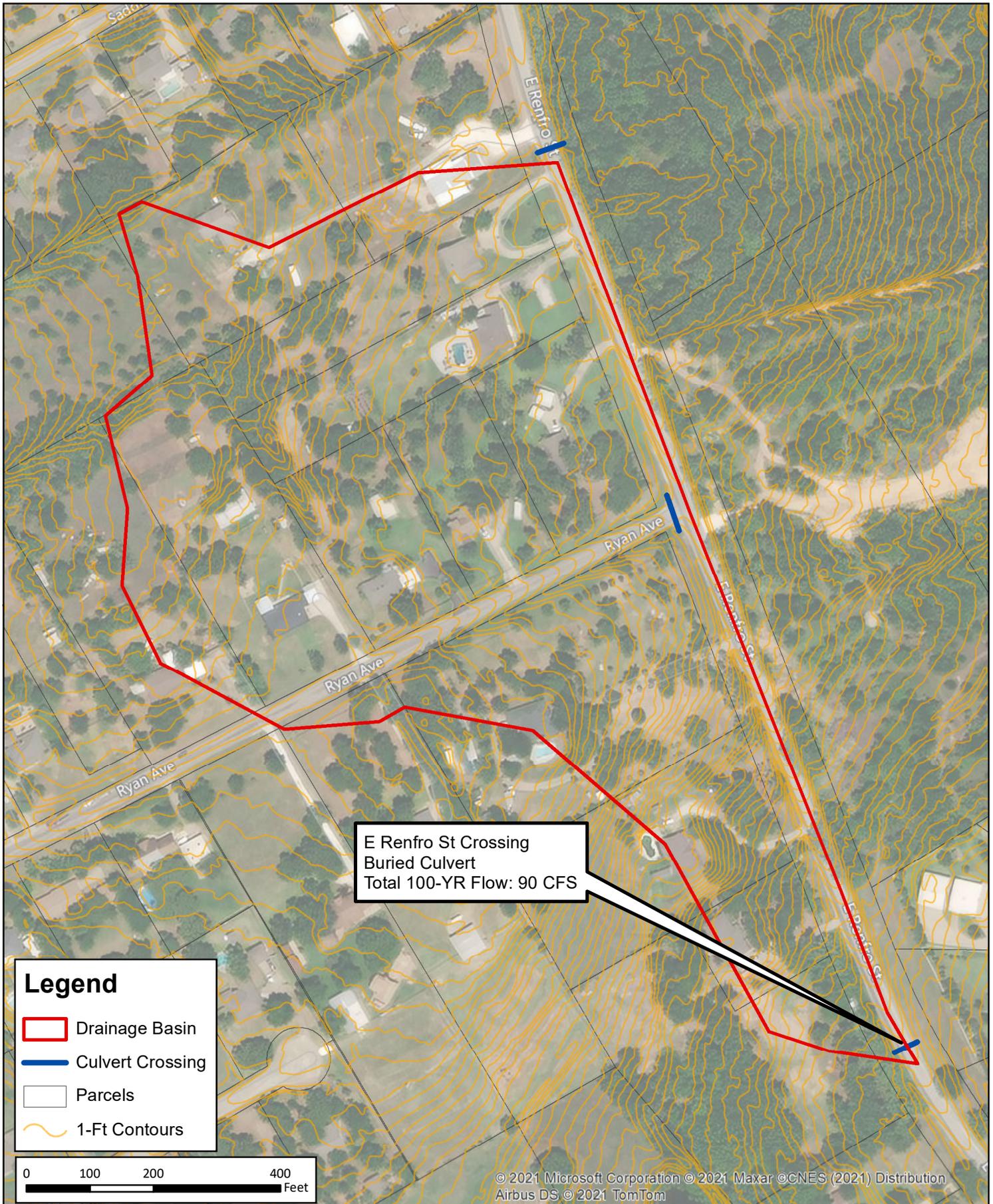
In addition to the runoff from this drainage basin, the culvert crossing also receives runoff from an upstream drainage basin which drains to a culvert crossing approximately 550 feet north of the intersection of E Renfro Street and County Road 518, as mentioned above. The drainage basin to the northern culvert crossing has an area of 18.8 acres and is estimated to produce a runoff of approximately 90 cfs. As stated above, the existing culvert at this location has capacity for approximately 30% of this flow. The flow which is not conveyed by this culvert continues downstream to the study point at the

intersection of E Renfro Street and County Road 518. This brings an additional 60 cfs to this culvert, for a total flow of 145 cfs.

The existing crossing is undersized for this amount of flow. Based on the size of the culvert crossing, it is assumed that when the culvert operates at full capacity it can provide conveyance for approximately 15% of the calculated runoff. While this does not meet the City's design standards for culverts, it is a fairly common condition for non-urbanized drainage systems.

Recommendations were developed for improving drainage conditions at this crossing. Substantial improvements would be needed to provide 100-year capacity to meet City criteria. In order to upsize the culvert to an adequate size for the 100-year storm, the existing ditch would need to be deepened and headwalls would need to be implemented to accommodate the larger pipe and ditch. In addition, a larger outfall channel would be needed to receive the increased flow allowed through the crossing. The improved crossing would exceed the capacity of adjacent driveways and ditch sections and therefore provide minimum benefit. Upgrading the crossing to a 100-year capacity would therefore not be a feasible recommendation due to the potential impact to downstream conditions and the significant costs.

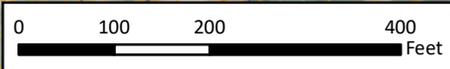
Because full capacity improvements are not feasible, other courses of action were considered which are less intrusive but would still provide some drainage benefit. It is recommended to replace the existing CMP culvert with an upsized reinforced concrete pipe (RCP) culvert. The new RCP would be sized at 30" to match the size of the driveway culvert immediately downstream and ensure the downstream culvert does not experience increased flow beyond its existing capacity. While this would not improve the County Road 518 crossing to a 100-year capacity, it would allow for an increase in capacity and would resolve the loss of capacity due to existing pipe damage. Small headwalls should also be constructed for the new RCP to prevent future erosion or pipe damage at the crossing. As part of the improvements, the area of ditch near the culvert openings will be cleared of the silt and debris that has accumulated in order to restore full capacity to the new culvert and ditch sections.



E Renfro St Crossing
 Buried Culvert
 Total 100-YR Flow: 90 CFS

Legend

- Drainage Basin
- Culvert Crossing
- Parcels
- ~ 1-Ft Contours



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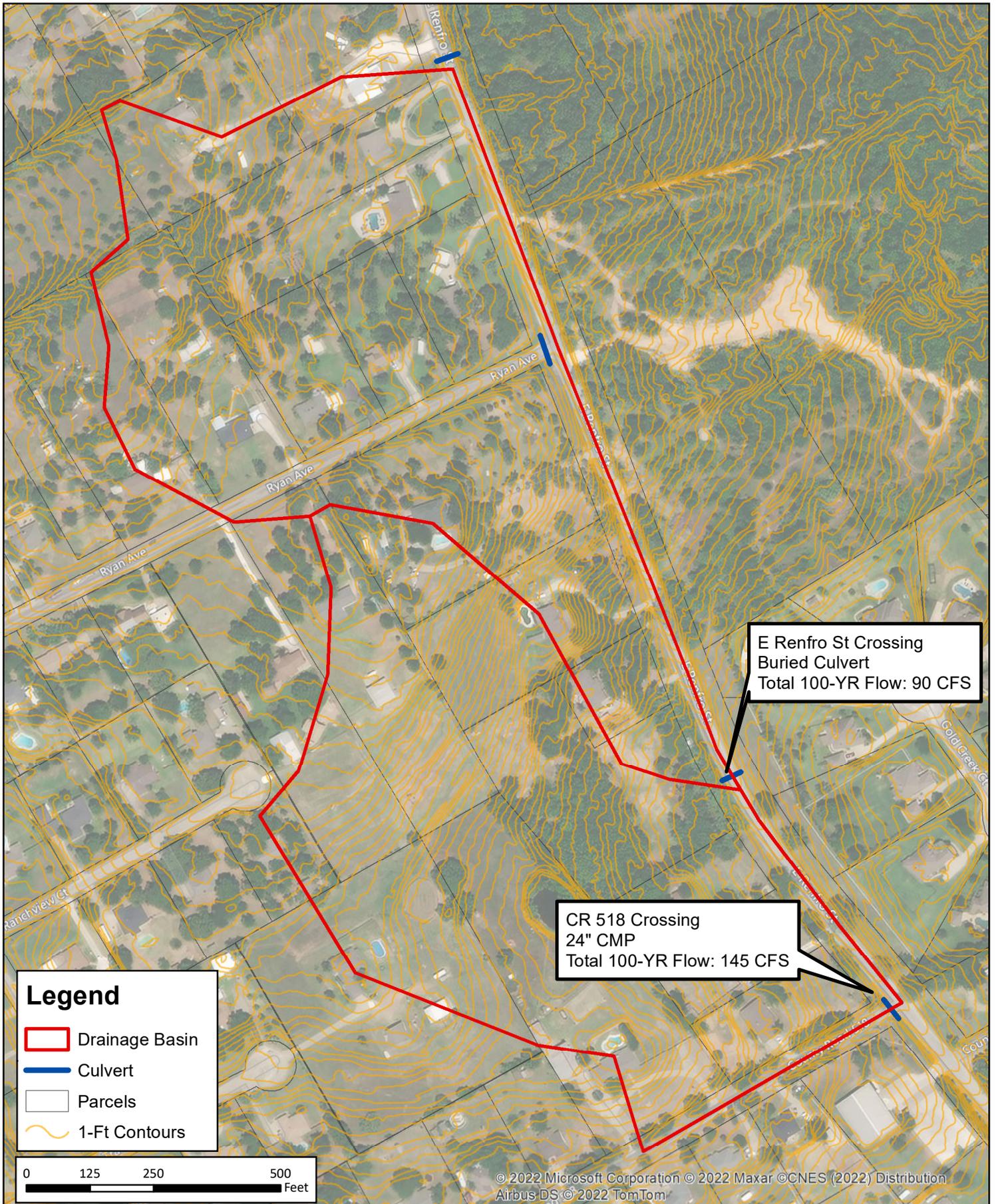


E Renfro Crossing Study Area

Misc E Renfro Drainage Evaluations

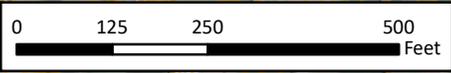
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Legend

- Drainage Basin
- Culvert
- Parcels
- ~ 1-Ft Contours



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E Renfro St - CR 518 Study Area

Misc E Renfro Drainage Evaluations

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DATE	3/30/2022	
SCALE	1:3,000	
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