Comprehensive Drainage Master Plan

City of Bryant

Phase 1 Report

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Garver Project No.: 20T20090

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1.0 Project Description

A Comprehensive Drainage Master Plan (CDMP) is being developed for the City of Bryant. The purpose of the City of Bryant CDMP is to:

- Evaluate the existing drainage conditions of the City and Extra-Territorial Jurisdiction (ETJ), also known as the planning area;
- Identify current and future drainage problems;
- Generate proposed solutions to identified problems;
- Develop a Capital Improvement Plan (CIP); and
- Provide tools for managing future development.

The CDMP project is being performed in two (2) phases. Phases 1 and 2 will be divided into major tasks, with subtasks listed as applicable below these major tasks. **Figure 1** shows a flow chart of the overall project process.

- Phase 1: Data Collection and Initial Drainage Study Screening
- Phase 2: Survey Collection, Hydrologic and Hydraulic Modeling, Identification of Drainage Problems, Alternative Development, and CIP Development

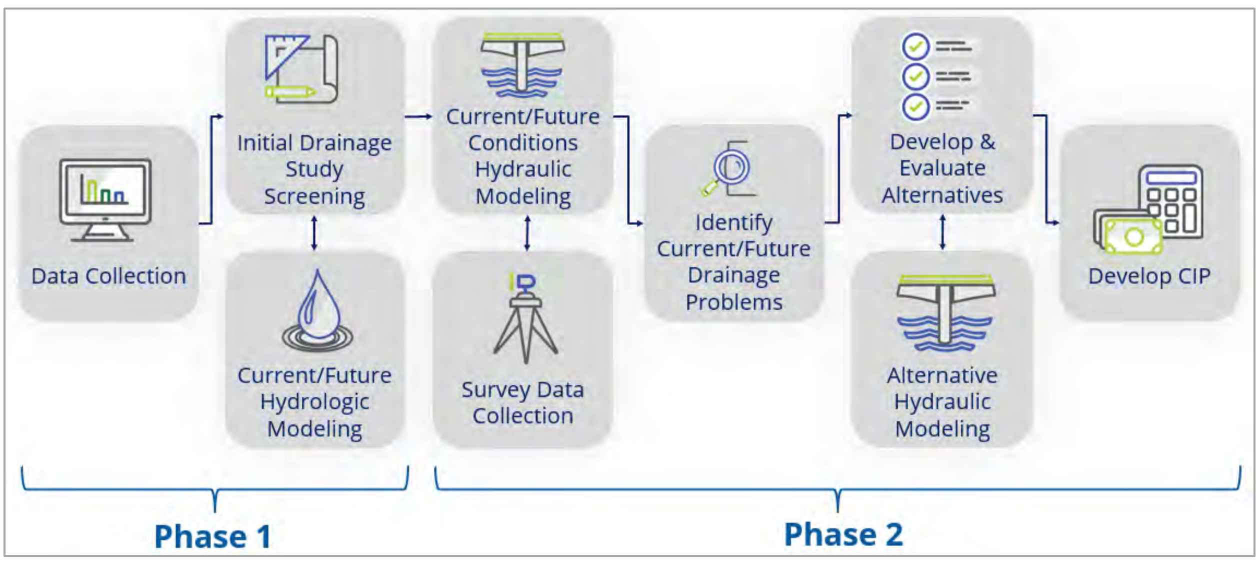


Figure 1. CDMP Project Process

This report discusses the processes and findings of Phase 1.

2.0 General Information

According to the project Request for Qualifications (RFQ), the City of Bryant is a home-rule city with an incorporated population of 20,231, according to the 2020 census. The City has experienced rapid growth, especially over the past five years, and expects to continue this trajectory of growth in the future. The growth consists of both residential and commercial development, increasing the demand on the existing drainage infrastructure of the City and showing the need for updated and improved infrastructure.

The City of Bryant planning area includes three main drainage basins: Hurricane Creek, Crooked Creek, and Owen Creek. Hurricane Creek is the most western basin, draining approximately 52% of the Bryant planning area. Owen Creek receives approximately 23% of the drainage and is in the northeastern portion of the planning basin. The remaining 25%, located in the southeastern section of the planning area, drains to Crooked Creek. A map of the study area and the three main drainage basins is shown in **Figure 2**.

Since 2008, a number of large flooding events have occurred throughout the City. This recurrence of significant flood issues has led to the need for a comprehensive study and plan for drainage within the City and planning area. This plan, as described in Section 1.0, will provide the City with tools to improve existing drainage conditions and plan for future mitigation. Phase 1 of the CDMP involves Data Collection and an Initial Drainage Study Screening. The results of these tasks will lead to the identification of areas for further study and improvement. Following the completion of Phase 1, a detailed scope of Phase 2 will be developed.

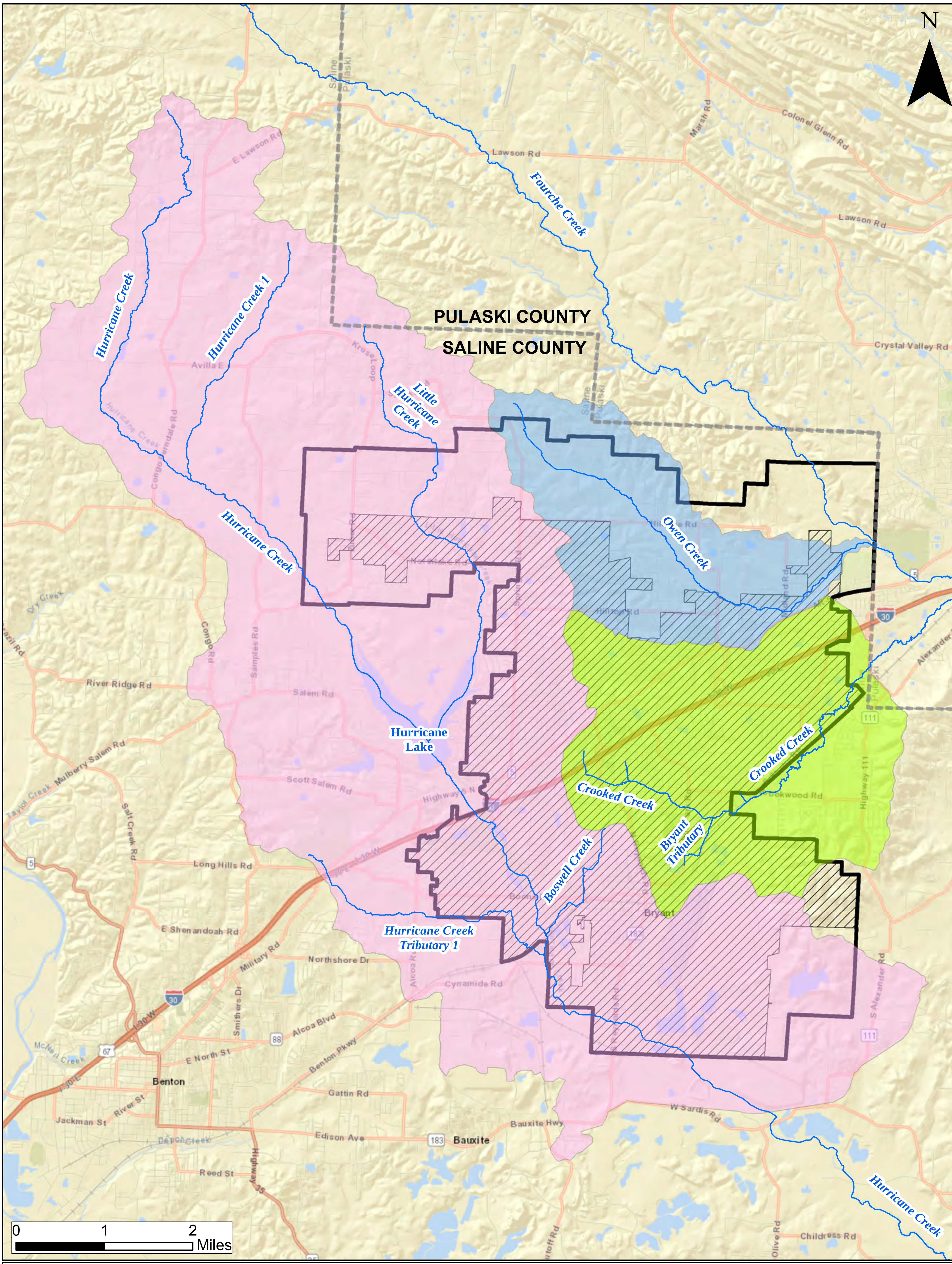


FIGURE 2.
CDMP STUDY AREA MAP

Streams
Bryant City Limits
Bryant Planning Area
Crooked Creek Basin
Hurricane Creek Basin
Owen Creek Basin

2.1 Drainage Basin Characteristics

The City of Bryant is located along a large drainage divide between two United States Geological Survey (USGS) Hydrologic Unit Code 6 (HUC-6) watersheds, the Lower Ouachita and the Lower Arkansas – Fourche La Fave. The city limits and planning area are divided into three smaller drainage basins: Crooked Creek, Hurricane Creek, and Owen Creek. Hurricane Creek is located along the western portion of the city and contributes to the Lower Ouachita Watershed. The other two basins, Crooked Creek and Owen Creek, are located in the eastern portion of the city and contribute to the Lower Arkansas – Fourche La Fave Watershed. The three drainage basins are described below.

2.1.1 Crooked Creek Basin

The portion of Crooked Creek Basin studied for this CDMP is roughly 9.7 square miles. As mentioned in Section 1.0, Crooked Creek makes up approximately 25% of the planning area. When compared to the current city limits, Crooked Creek Basin accounts for approximately 36% of the area.

The headwaters of Crooked Creek are located within city limits, just west of the intersection of Highway 183 (Reynolds Road) and Highway 5. Runoff flows generally south from this area, draining to a ditch south of W. Commerce Street. This ditch then flows under I-30 and turns generally east-southeast. Crooked Creek Tributary begins just north of I-30 near Main Street and flows south under the interstate until its confluence with Crooked Creek at Dell Drive.

After flowing under Highway 183, Crooked Creek continues east under Mills Park Road. Approximately 1,800 feet downstream of Mills Park Road, Bryant Tributary flows into Crooked Creek. This tributary drains the area northwest of Saline County Airport and the Bloomfield Hills subdivisions. Approximately 1,300 feet downstream of the tributary confluence, Crooked Creek passes under the Union Pacific Railroad. Just upstream of this crossing, the terrain allows for some flow to leave Crooked Creek along the north (upstream) side of the railroad embankment. The ditch in this area is labeled as Trailer Park Ditch, which flows east for approximately 1,100 feet before also passing under the railroad. Trailer Park Ditch flows back into Crooked Creek just west of Linden Drive.

Crooked Creek flows northeast along the south side of the railroad embankment for approximately 8,800 feet before flowing back under the railroad. The portion of Crooked Creek and its drainage basin south of the railroad are outside of Bryant city limits and the planning area.

Crooked Creek reenters the city limits after passing back under the railroad approximately 1,200 feet east of S. Shobe Road. The creek then flows generally east-northeast through undeveloped land until leaving the city limits and planning area approximately 1,450 feet west-southwest of Highway 111 (Alexander Road). Crooked Creek continues flowing generally northeast until it drains into Fourche Creek near Pulaski Technical College in Pulaski County. Fourche Creek flows through the City of Little Rock and eventually drains into the Arkansas River.

2.1.2 Hurricane Creek Basin

Hurricane Creek Basin accounts for approximately 55% of the Bryant city limits and 52% of the planning area. The total study area analyzed for the CDMP, including portions outside the planning area, is approximately 44.9 square miles.

The headwaters of Hurricane Creek begin approximately 4,500 feet northwest of the intersection of W. Lawson Road and Congo Ferndale Road in rural Saline County. It flows generally south-southeast, eventually feeding into the western branch of Hurricane Lake. The lake is reported by the Encyclopedia of Arkansas as a 332-acre manmade lake constructed in 1942. Hurricane Lake is located within the City of Benton near the Bryant city limits. The eastern branch of Hurricane Lake is fed by Little Hurricane Creek. Little Hurricane Creek begins near the Saline County/Pulaski County line just north of Sparks Road. It flows generally south under Northlake Road before entering the lake. The confluence of the two branches of Hurricane Lake occurs approximately 2,100 feet upstream of the Hurricane Lake Dam.

Hurricane Creek continues downstream of the Hurricane Lake Dam outfall, flowing under Highway 5 and I-30. The creek then continues south through The Greens at Hurricane Creek, an 18-hole golf course and apartment community. Several small weirs create ponds in this area. Just south of the golf course, Hurricane Creek flows under Boone Road. Boone Road experiences frequent overtopping in the area of Hurricane Creek. Downstream of Boone Road, Hurricane Creek continues south-southeast under the Union Pacific Railroad and Cynamide Road. It then turns more southeast and flows under Highway 183 (Reynolds Road). The creek then flows out of the city limits and planning area. Hurricane Creek continues flowing south-southeast for over 35 miles before flowing into the Saline River near the Grant County/Dallas County line.

2.1.3 Owen Creek Basin

Owen Creek is the smallest drainage basin within the city limits, accounting for only about 9%. It makes up approximately 23% of the planning area. Overall, the studied drainage basin for Owen Creek is approximately 6 square miles.

The headwaters of Owen Creek begin just outside the planning area near the intersection of Springhill Road and Pamela Way. Owen Creek flows generally southeast through a mostly wooded area. It flows under Hilldale Road twice, entering the city limits at the more downstream crossing of the road. It then flows under Midland Road before turning northeast. Owen Creek flows into Fourche Creek approximately 3,000 feet upstream of the Fourche Creek crossing of Highway 5 (Stagecoach Road). Fourche Creek flows through the City of Little Rock before draining into the Arkansas River.

3.0 Data Collection

In order to complete the CDMP, an array of data was collected. The collected data and information are described in the sections below.

3.1 Historical Records of Drainage, Flooding, and Rainfall

3.1.1 City and Public News Records

The City has documented many past flood events. Historical flood data was compiled from various sources, including City personnel, local news stories, and official social media reports. Major flood events reported since 2008 are listed in **Table 1**. The events listed are based on available information; this is not a comprehensive list of all flood events affecting the City.

Table 1. Major Flood Events within the City of Bryant

Date	Location of Flood Issue	Flood Type	Stream Affected	Total Event Precipitation (in)*
March 30-April 4, 2008	Forest Cove/Augusta Cove	Roadway, Yard, Residential	Shoal Creek	4.20
April 30-May 20, 2011	Boone Road	Roadway	Hurricane Creek	6.26
November 20-22, 2011	Boone Road	Roadway	Hurricane Creek	7.02
March 20-23, 2012	Boone Road	Roadway	Hurricane Creek	5.53
April 29-30, 2017	Boone Road	Roadway	Hurricane Creek	5.14
February 19-24, 2018	Boone Road	Roadway	Hurricane Creek	8.44
April 18, 2019	Hilldale Road/Hilltop Road/Springhill Road/Midland Road	Roadway	Owen Creek	5.44
May 17-20, 2021	Oak Glenn Neighborhood	Roadway, Yard, Residential	Owen Creek Tributary	2.26
March 22, 2022	Boone Road	Roadway	Hurricane Creek	3.35

**Total event precipitation from NOAA weather station at Adams Field at Little Rock National Airport.*

3.1.2 Rainfall Data

3.1.2.1 Historical Rainfall Data

Historical rainfall data was available from the National Weather Service (NWS) for Adams Field at the Little Rock National Airport (LIT), which is located approximately 15 miles to the northeast of Bryant. This is the nearest National Oceanic and Atmospheric Administration (NOAA) weather station to the City of Bryant. **Figure 3** displays the daily total rainfall amounts record at LIT since 2000. This data was collected from the NOAA National Centers for Environmental Information website.

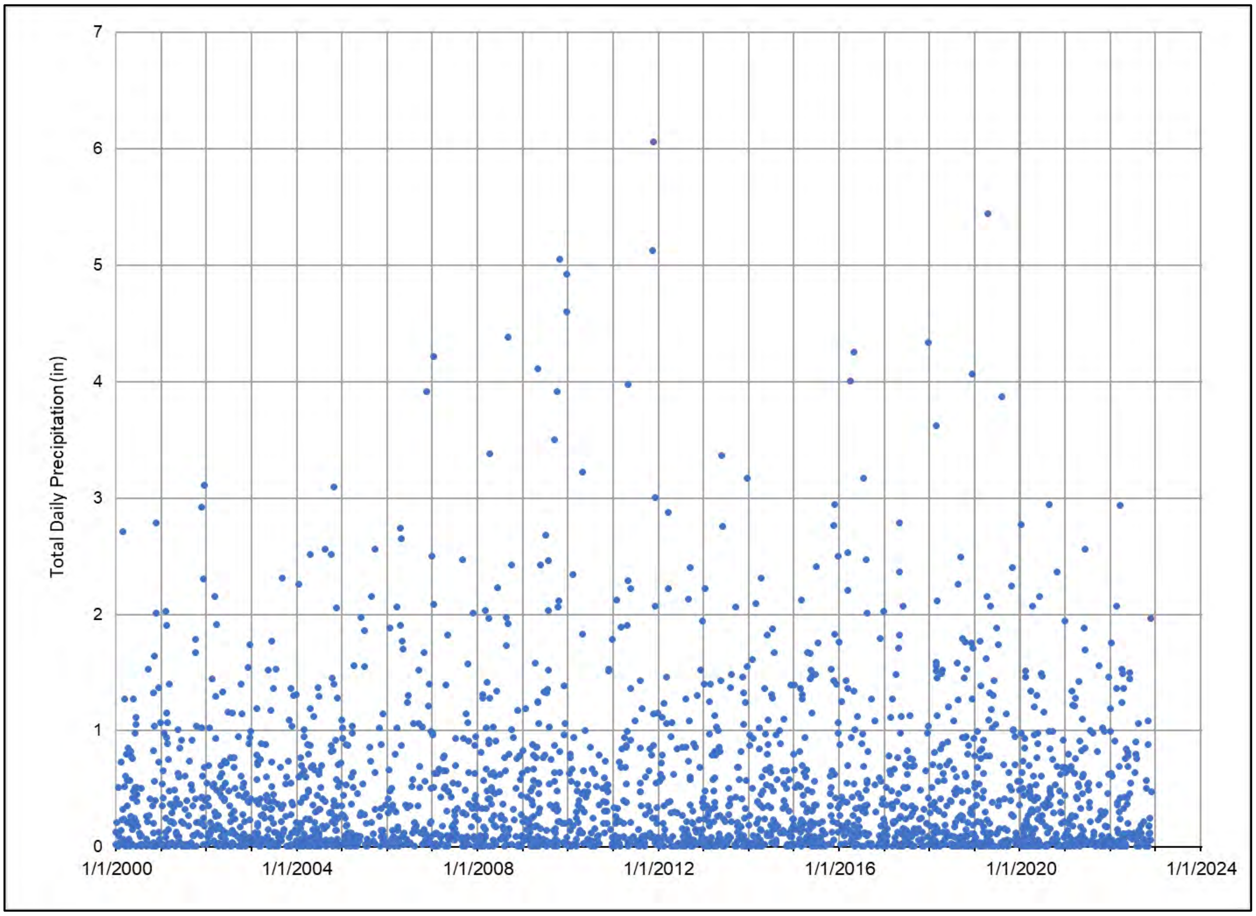


Figure 3. Daily Total Rainfall Data at Little Rock National Airport

Since January 1, 2000, over 2,400 days recorded at least 0.01 inches of rainfall. Of those days, 252 days recorded between 1 and 2 inches, 73 days recorded between 2 and 3 inches, and 27 days recorded greater than 3 inches of rainfall. The maximum recorded daily total rainfall was 6.06 inches, occurring on November 21, 2011.

3.1.2.2 Statistical Rainfall Data

Statistical rainfall data for the City of Bryant was collected from the NOAA Atlas 14 Precipitation Frequency Data Server (Atlas 14) website. Select data is presented in **Table 2**. This precipitation data represents average partial duration time series amounts for specific durations. Select durations and recurrence intervals were chosen based on data that planned for use during the hydrologic task of this project.

Table 2. Select Atlas 14 Precipitation Frequency Data (in inches) for Bryant, Arkansas

Duration	Average Recurrence Interval (years)						
	2	**5**	**10**	**25**	**50**	**100**	**500**
5 min	0.514	0.61	0.687	0.79	0.865	0.939	1.10
15 min	0.919	1.09	1.23	1.41	1.55	1.68	1.97
1 hr	1.82	2.17	2.44	2.82	3.10	3.38	4.00
2 hr	2.28	2.70	3.05	3.52	3.88	4.24	5.06
3 hr	2.56	3.04	3.44	4.00	4.43	4.87	5.91
6 hr	3.09	3.72	4.26	5.03	5.64	6.27	7.82
12 hr	3.70	4.55	5.28	6.35	7.21	8.11	10.4
1 day	4.37	5.43	6.35	7.71	8.81	9.97	12.9

3.1.3 Residential Drainage Issue Database

For this CDMP, a public comment period was issued to allow city residents to submit drainage issues. The comment period ran from April 10 to May 22, 2022. A total of 264 comments were received. **Table 3** gives a breakdown of the received comments by issue type.

Table 3. Resident Comments by Type

Issue Type	Number of Reported Issues
House or Business Flooding	37
Roadway Flooding	44
Yard Flooding	161
Other (includes erosion, storm sewer)	14

According to **Table 3**, over half of the issues reported by residents involved flooding issues in residential or commercial green space (i.e. yards). However, 14% of comments involved flooding that affected a building. Residents that chose the “other” category provided comments involving issues such as stream bank erosion or storm sewer issues.

Table 4 displays the number of comments within each of the three major drainage basins. Crooked Creek Basin reported just over 49% of the comments, and Hurricane Creek Basin reported 45%. Only 6% of the comments were located within the Owen Creek Basin.

Table 4. Resident Comments by Basin

Drainage Basin	Number of Reported Issues
Crooked Creek Basin	128
Hurricane Creek Basin	119
Owen Creek Basin	17

Table 5 provides the number of comments located within a Flood Emergency Management Association (FEMA) Special Flood Hazard Area (SFHA).

Table 5. Resident Comments by FEMA SFHA

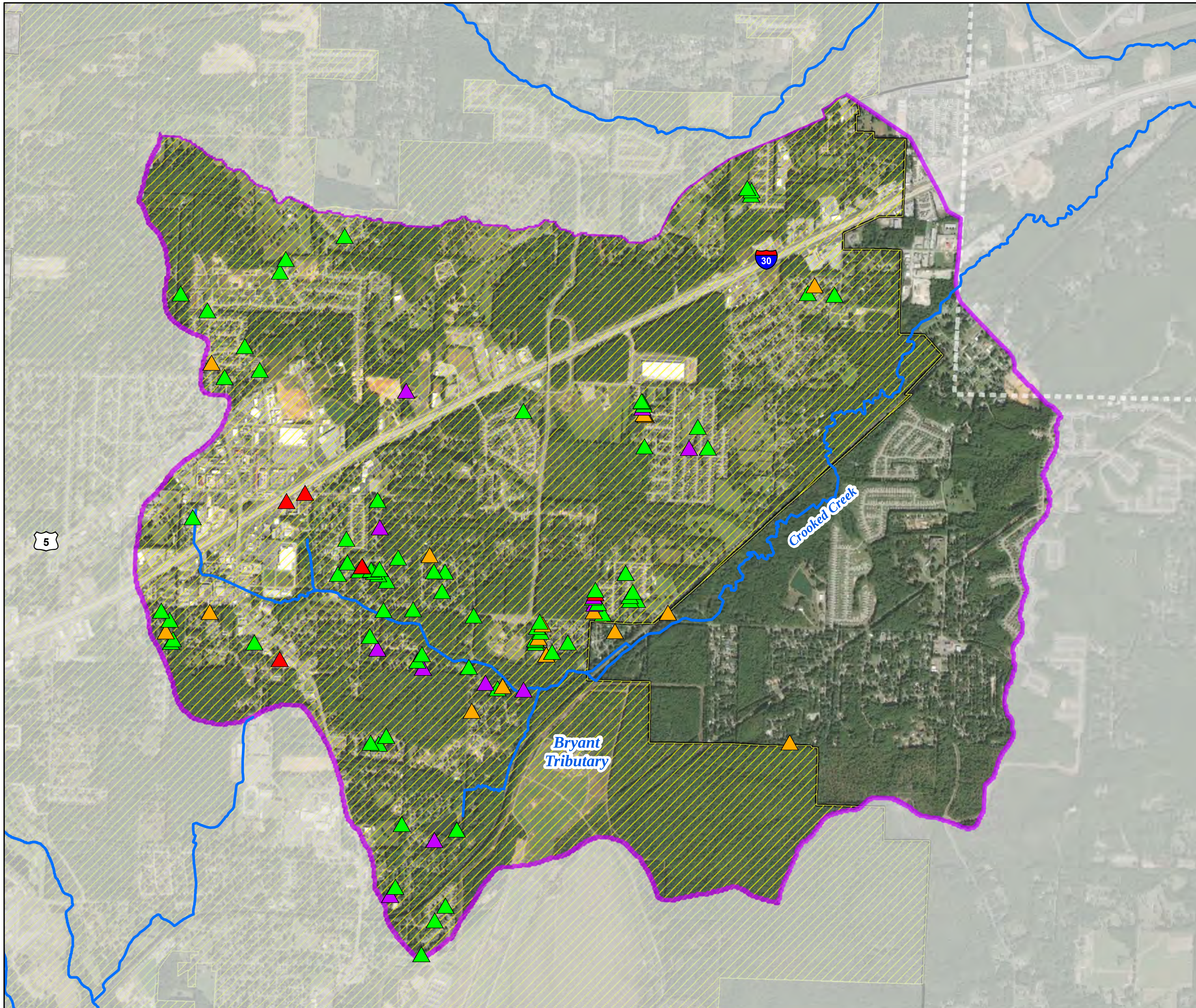
Special Flood Hazard Area	Number of Reported Issues
Floodway	3
Zone A/AE (non-floodway)	14
Zone X, 0.2% Annual Chance Event	2
Zone X, Minimal Flood Hazard	245

The data presented above suggests that most drainage issues within the City occur outside of FEMA-mapped floodplains. All three comments within a mapped floodway occurred along Crooked Creek. The comments regarding issues within Zone A or AE floodplains occurred in all three basins, with the highest concentration of issues occurring along Hurricane Creek near Boone Road and the confluence with Boswell Creek.

Figure 4 shows the resident reported comments within Crooked Creek Basin. **Figure 5** displays the comments within Hurricane Creek Basin, and **Figure 6** shows the comments within Owen Creek Basin. All resident comments are available in Appendix A.

The resident comments were analyzed and later used to compare to hydraulic modeling results for verification of drainage issues. Appendix A includes information regarding the hydraulic modeling results and the identified potential drainage project locations corresponding to the resident comments.

FIGURE 4. CROOKED CREEK BASIN ISSUE MAP



House/Business Issue
Road Issue
Yard Issue
Other Issue
Streams
Bryant City Limits
Bryant Planning Area

N

0 0.5 1 Miles

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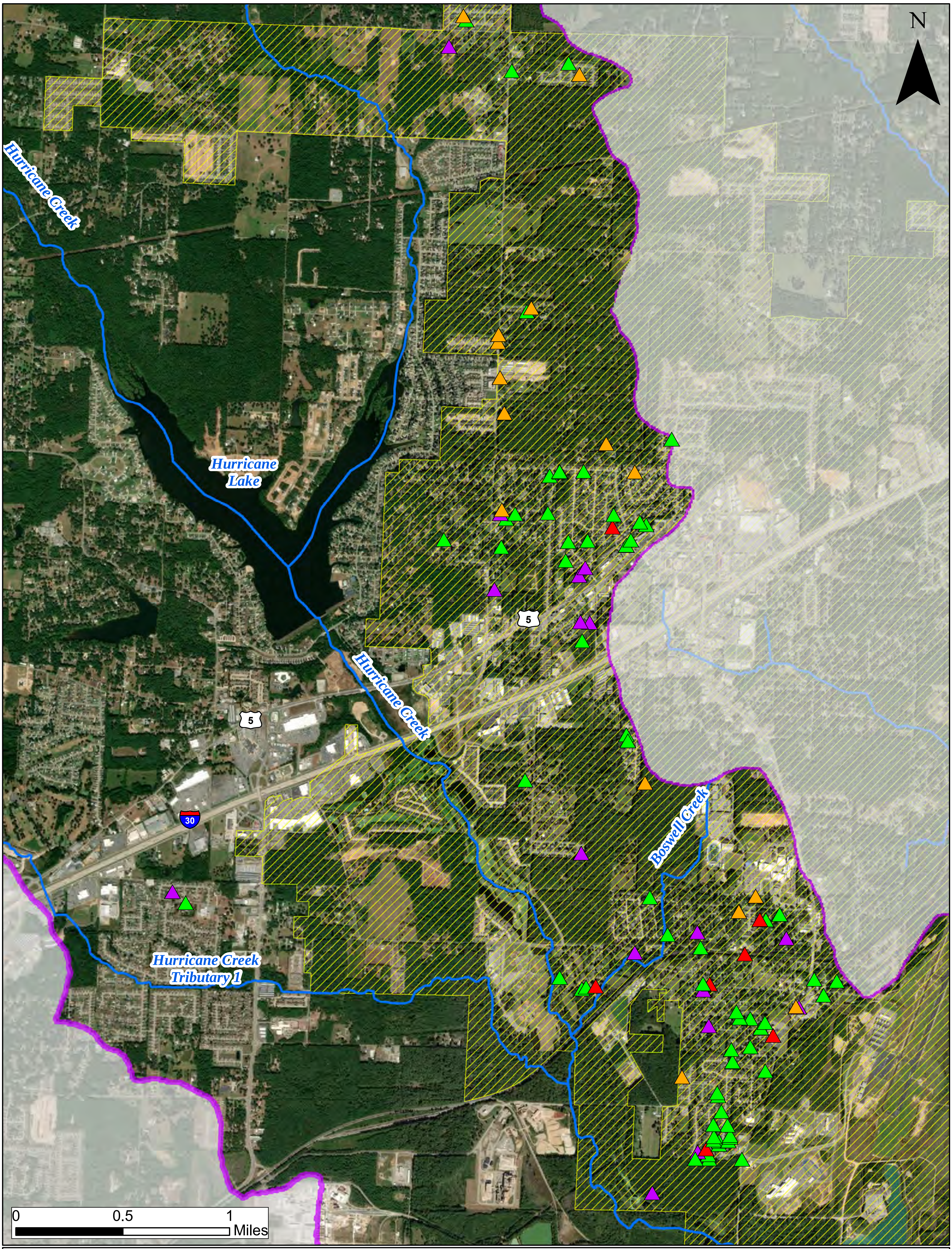

FIGURE 5.
HURRICANE CREEK BASIN ISSUE MAP

- House/Business Issue
- Road Issue
- Yard Issue
- Other Issue
- Streams
- Bryant City Limits

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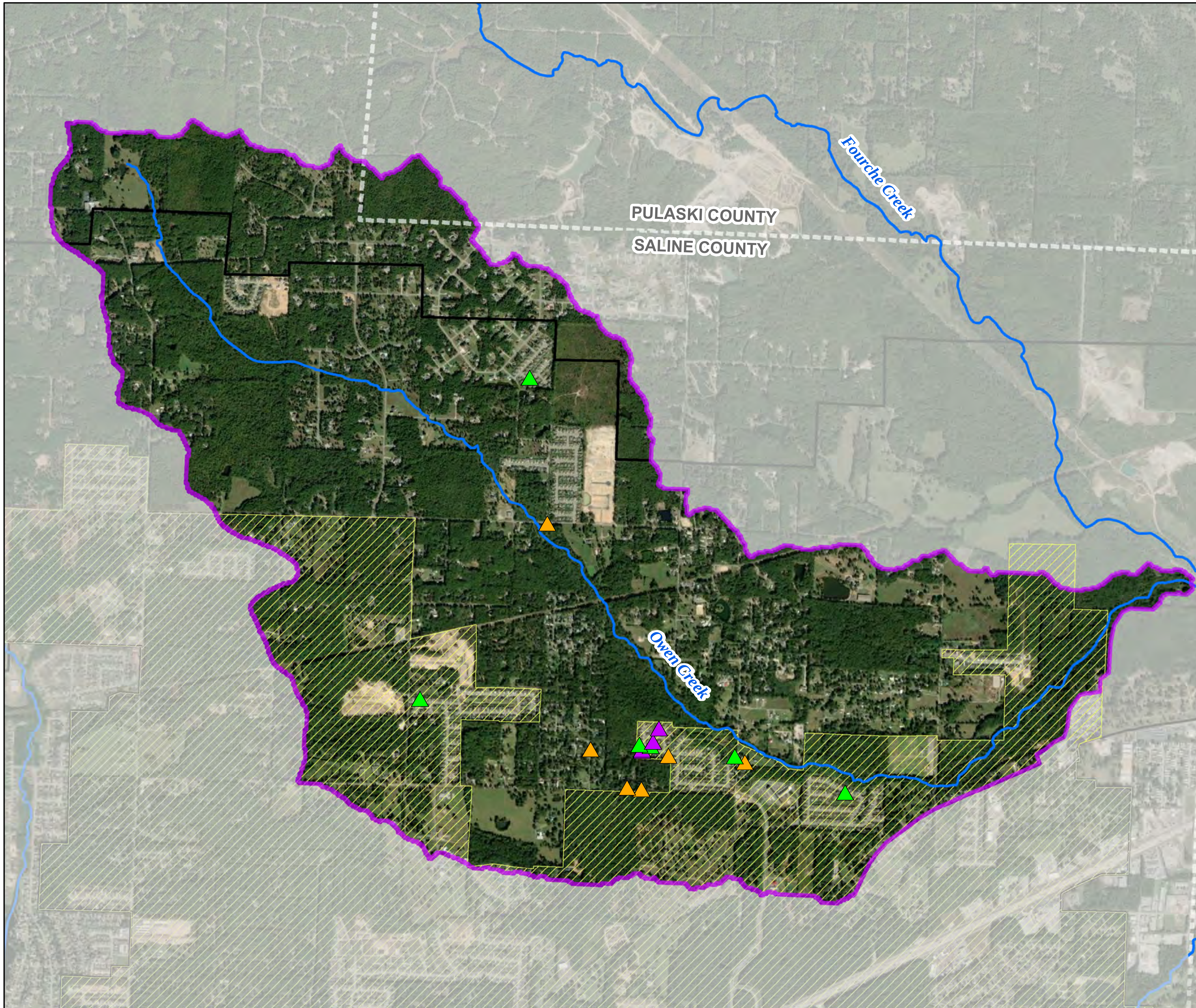

FIGURE 6. OWEN CREEK BASIN ISSUE MAP

House/Business Issue
Road Issue
Yard Issue
Other Issue
Streams
Bryant City Limits
Bryant Planning Area

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0 0.5 1 Miles

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3.2 FEMA NFIP Data

3.2.1 FEMA Mapping and Data

The City of Bryant participates in the FEMA National Flood Insurance Program (NFIP). Current floodplain information and mapping is available in Flood Insurance Study (FIS) Report numbers 05125CV0001B and V0002B for Saline County, Arkansas, and Incorporated Areas. The City is mapped within Flood Insurance Rate Map (FIRM) Panels 0225E, 0240E, 0370E, and 0380E. The planning area has multiple streams that are mapped as Zone A or AE, which designates a 1% annual exceedance probability (AEP) (commonly known as 100-year) event boundary.

Zone AE mapping indicates that a detailed hydraulic study has been performed on the mapped stream. Typically, Zone AE mapping includes a regulatory floodway, which represents the encroachment boundary along a stream that would increase the base flood elevations (BFEs) by up to 1 foot. The stream extents mapped as Zone AE with floodway are listed in **Table 6**.

Table 6. Effective Zone AE with Floodway Streams

Drainage Basin	Stream Name	Zone AE Mapped Stream Extents
Hurricane Creek Basin	Hurricane Creek	Approximately 2,400 feet downstream of Zuber Road (near upstream end of Hurricane Lake) to just downstream of Highway 183
	Little Hurricane Creek	Just downstream of Northlake Road to confluence with Hurricane Creek
Crooked Creek Basin	Crooked Creek	Approximately 650 feet upstream of Highway 183 to confluence with Fourche Creek (confluence located in Pulaski County)
	Crooked Creek Tributary	Just downstream of I-30 to confluence with Crooked Creek
	Bryant Tributary	Just downstream of Arcadia Circle to confluence with Crooked Creek
	Trailer Park Ditch	From flow diversion near Union Pacific Railroad crossing to confluence with Crooked Creek
Owen Creek Basin	Owen Creek	Approximately 1,950 feet upstream of Hilldale Road to confluence with Fourche Creek

Zone A mapping indicates an approximated 1% AEP floodplain boundary for a stream for which a detailed study has not been performed. These streams do not have a mapped floodway. The stream extents in the city limits and planning area that are mapped as Zone A are listed in **Table 7**. All Zone A mapped streams are in the Hurricane Creek Basin. Effective FEMA floodplain mapping for Hurricane Creek Basin, Crooked Creek Basin, and Owen Creek Basin is shown in **Figures 7**, **8**, and **9**, respectively.

Table 7. Effective Zone A Streams

Drainage Basin	Stream Name	Zone A Mapped Stream Extents
Hurricane Creek Basin	Hurricane Creek	Approximately 1,000 feet downstream of W. Lawson Road to approximately 2,400 feet downstream of Zuber Road (beginning of Zone AE mapping)
	Hurricane Creek	Just downstream of Highway 183 (end of Zone AE mapping) to confluence with Saline River (in Grant County)
	Hurricane Creek 1	Approximately 6,700 feet upstream of S. Avilla Road to confluence with Hurricane Creek
	Hurricane Creek 1.1	Approximately 2,000 feet upstream of Samples Road to confluence with Hurricane Creek 1
	Hurricane Creek 1.2	Approximately 1,200 feet downstream of Cow Patty Trail to confluence with Hurricane Creek 1
	Little Hurricane Creek	Just downstream of Hester Lake outfall to just downstream of Northlake Road (beginning of Zone AE mapping)
	Little Hurricane Creek A	Approximately 740 feet upstream of E. Worth Avenue to confluence with Little Hurricane Creek
	Little Hurricane Creek B	Just downstream of Seven Landing Road to confluence with Little Hurricane Creek
	Little Hurricane Creek C	Approximately 800 feet upstream of Springhill Road to confluence with Little Hurricane Creek
	Little Hurricane Creek C1	Just upstream of Humes Road to confluence with Little Hurricane Creek C
	Little Hurricane Creek D	Approximately 2,150 feet upstream of Springhill Road to confluence with Hurricane Creek C

Drainage Basin	Stream Name	Zone A Mapped Stream Extents
	Little Hurricane Creek E	Approximately 420 feet upstream of Northlake Road to confluence with Hurricane Creek
	Little Hurricane Creek F	Approximately 2,000 feet upstream of Northlake Road to confluence with Hurricane Creek (at Northlake Road crossing)
	Hurricane Creek Tributary 1	Approximately 970 feet upstream of Heritage Farms Drive to confluence with Hurricane Creek
	Hurricane Creek Tributary 1A	Approximately 270 feet upstream of Bay Meadow Drive to confluence with Hurricane Creek Tributary 1
	Boswell Creek	Approximately 2,000 feet upstream of Boswell Road to confluence with Hurricane Creek

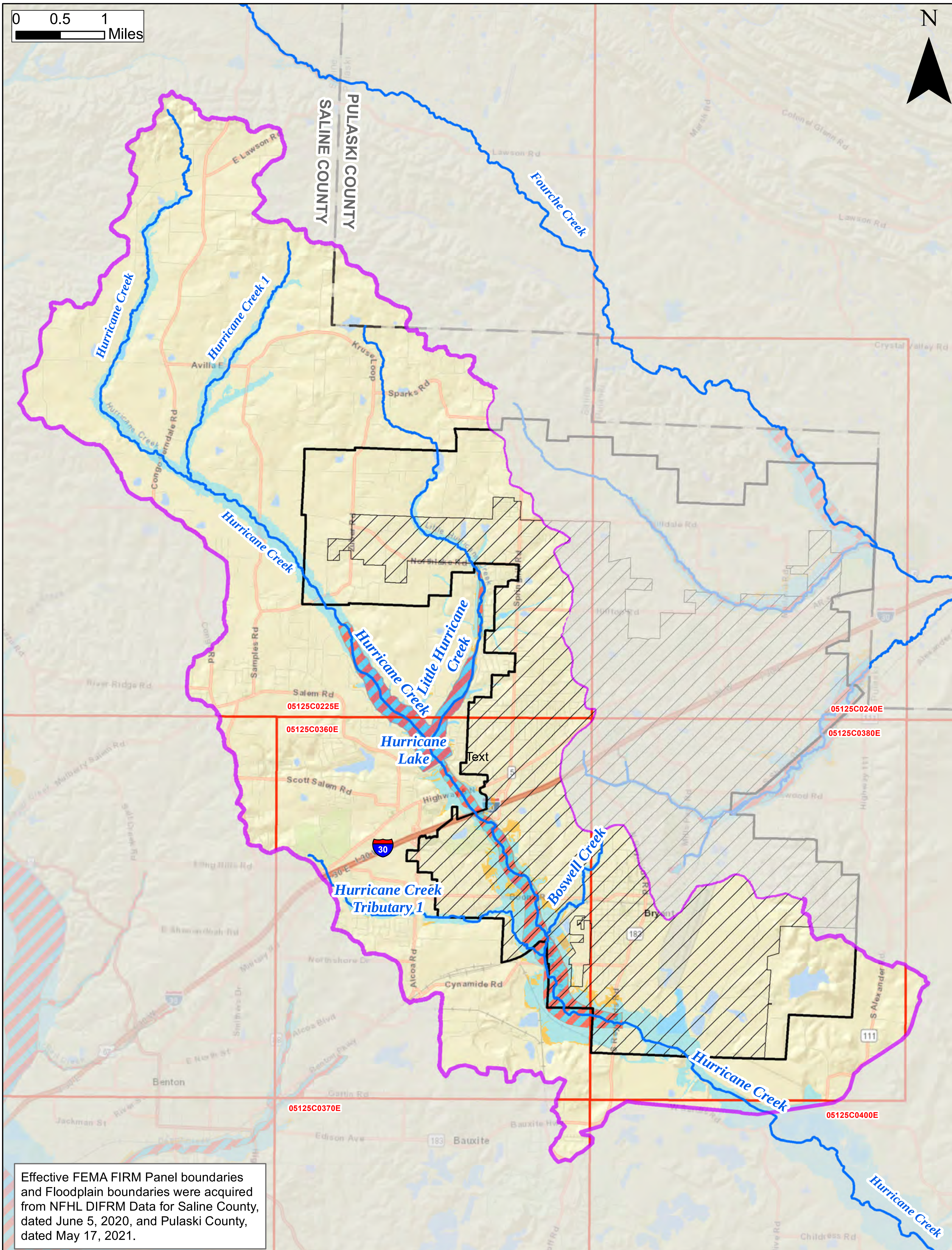

FIGURE 7.
HURRICANE CREEK BASIN FEMA MAP

Bryant City Limits
Bryant Planning Area
FEMA FIRM Panel
Floodway
1% Annual Chance Event
0.2% Annual Chance Event

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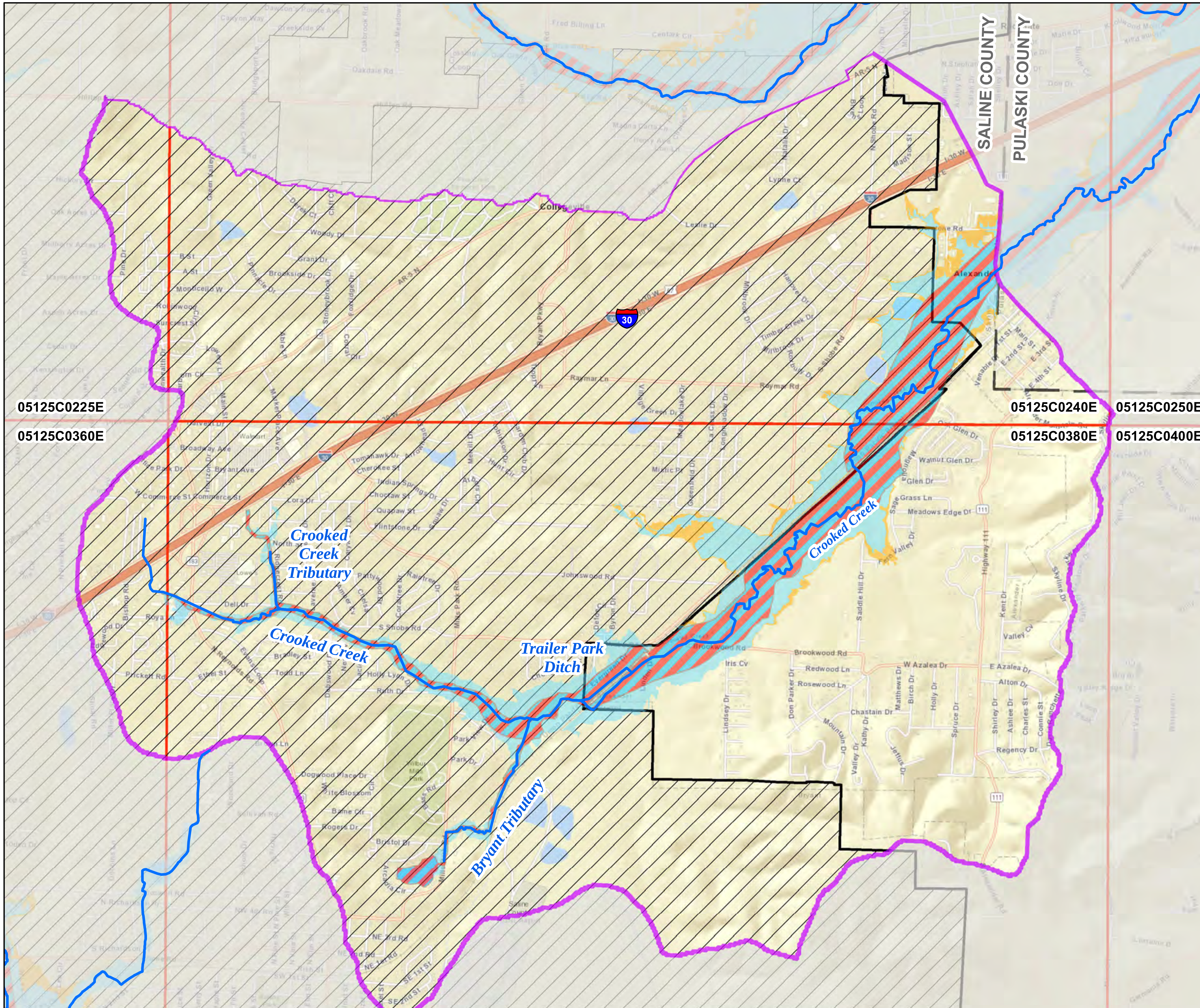

FIGURE 8. CROOKED CREEK BASIN FEMA MAP

- Floodway
- 1% Annual Chance Event
- 0.2% Annual Chance Event
- Bryant City Limits
- FEMA FIRM Panel
- Bryant Planning Area

Effective FEMA FIRM Panel boundaries and Floodplain boundaries were acquired from NFHL DIFRM Data for Saline County, dated June 5, 2020, and Pulaski County, dated May 17, 2021.

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0 0.5 1 Miles

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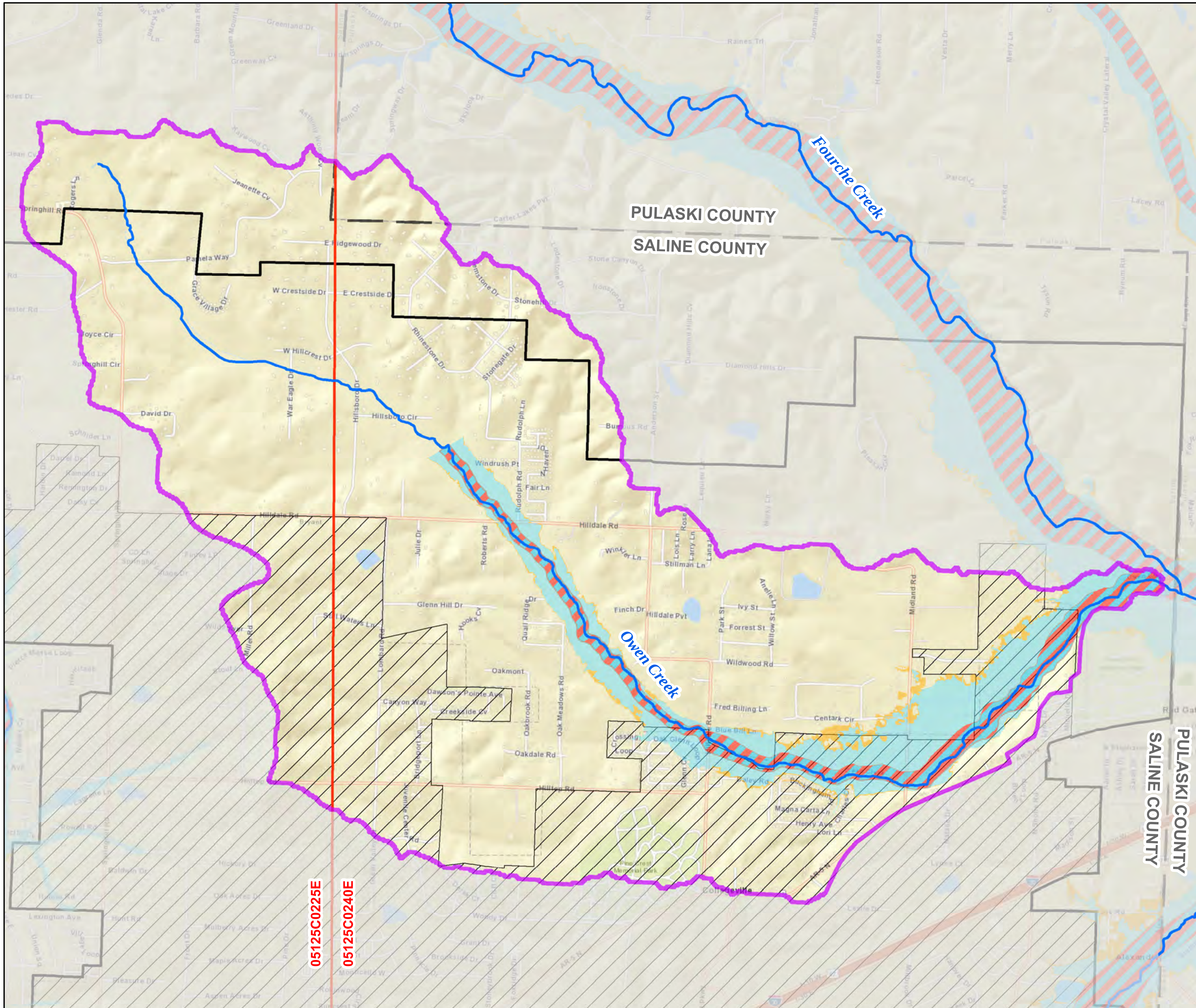
FIGURE 9. OWEN CREEK BASIN FEMA MAP



Effective FEMA FIRM Panel boundaries and Floodplain boundaries were acquired from NFHL DIFRM Data for Saline County, dated June 5, 2020, and Pulaski County, dated May 17, 2021.

3.2.2 Flood Insurance Policies and Repetitive Loss Data

Flood insurance policy data and repetitive loss information for the City of Bryant was acquired from the State NFIP coordinator at the Arkansas Natural Resources Division (NRD) in June 2022.

A total of 67 flood insurance policies were issued in the City at the time of data collection. Policy data is provided in **Table 8**. Of the 67 policies, 11 covered locations are located within Zone A or AE floodplains. The remainder of the policies were for Zone X locations.

Table 8. Flood Insurance Policy Data

Parameter	Value
Policy Count	67
Premium Total (includes federal policy fee)	$43,091
Total Building Coverage	$14,050,700
Total Contents Coverage	$4,276,000
Average Building Coverage	$209,712
Average Contents Coverage	$77,745

Repetitive loss data for the City is given in **Table 9**. Of the 14 claims made in the City, 6 of the properties have experienced repetitive losses.

Table 9. Repetitive Loss Data

Parameter	Value
Number of Property Losses	14
Repetitive Loss Properties	6
Total Building Payments	$240,906
Total Contents Payments	$66,925
Single Family Property Losses	6
Other Property Losses	0

Data relating to the insurance policies and repetitive losses in the City of Bryant is given in Appendix B.

3.2.3 Letters of Map Amendments

Though a structure may be located within a SFHA, the elevation of the structure, property, or portion of the property may be above the base flood elevation (BFE). In order to have the property removed and to lower or eliminate the need for its associated floodplain insurance, a Letter of Map Amendment (LOMA) can be applied for. The LOMA application requires that an Elevation Certificate (EC) be completed for the property to show record of its elevation. Currently, the FEMA Map Service Center has 35 LOMA documents on record for properties within the City of Bryant. Specific site information for the LOMAs in the City is given in Appendix C.

3.3 As-built Plans and Data for Existing Infrastructure

3.3.1 Roadway, Bridge, and Development Plans

The City of Bryant has many as-built drawings available for streets, structures, and subdivisions. Due to the volume of information available, as-built drawings will be requested for the CDMP as needed. These drawings will be utilized during the hydraulic modeling process to most appropriately represent the hydraulic system in the modeled areas. In addition, state highway structure drawings will be requested as needed from the Arkansas Department of Transportation (ARDOT).

3.3.2 Traffic Data

Average Daily Traffic (ADT) data is available for federal and state highways and other major roadways in Arkansas through ARDOT. The most current publicly available data is for 2021. **Figure 10** displays the 2021 map published by ARDOT and acquired from the ARDOT Traffic Information Systems website.

3.3.3 Roadway Functional Class

ARDOT provides functional classification for all state highways and interstates as well as some county and city streets. There are 65 roadways within the planning area with an assigned functional class. The classification identifies the type of service that the roadway is intended to provide. The ARDOT Roadway Drainage Manual defines the design storm events for each type of classification, with design events ranging from 2-year to 50-year depending on the functional class and type of drain.

The roadways within the planning area with an identified functional classification are listed in Appendix D.

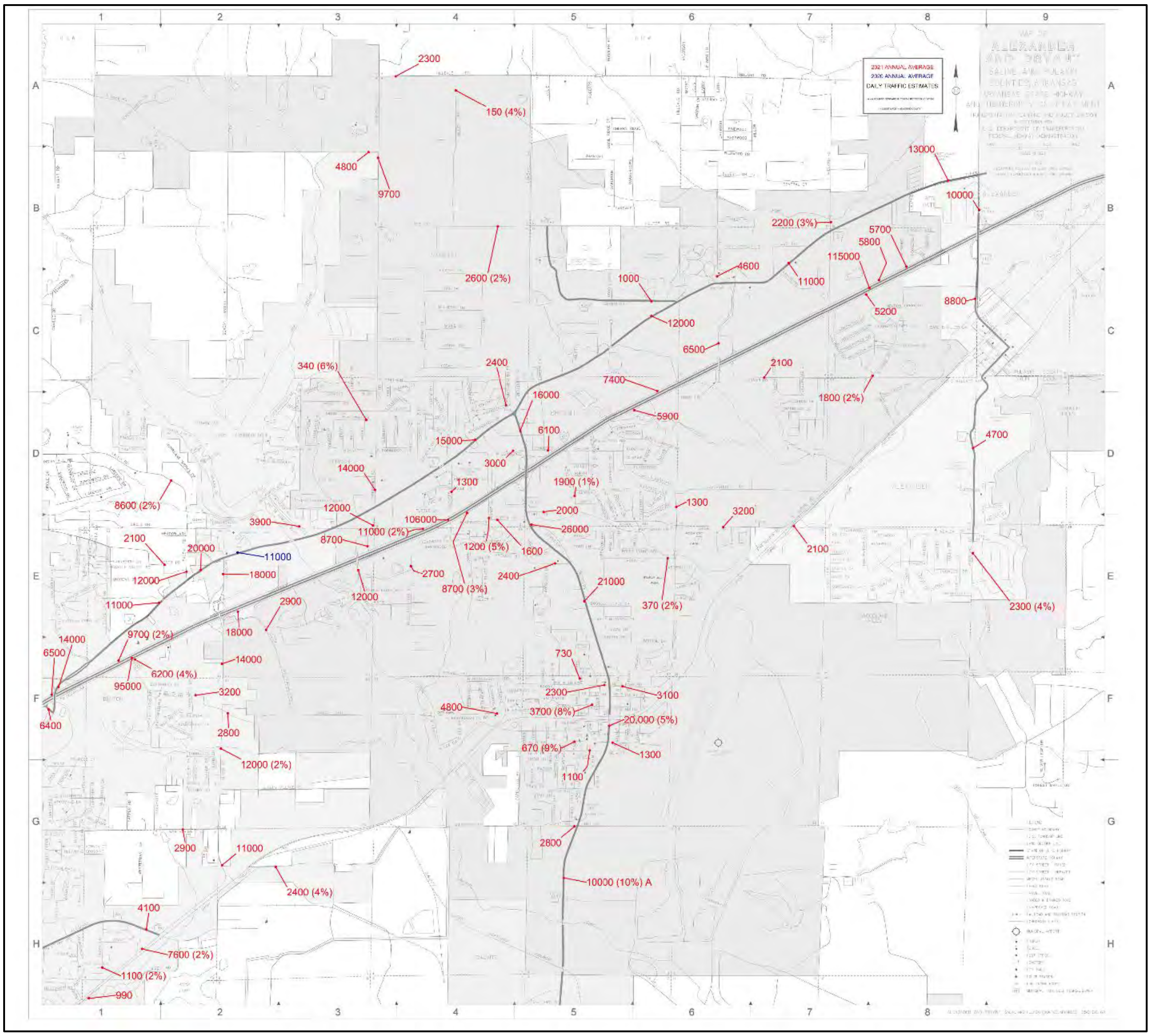


Figure 10. 2021 Average Daily Traffic Estimates for Bryant, Arkansas

3.4 Current Drainage Infrastructure

The City of Bryant has an extensive existing stormwater drainage system. The City provided Garver with a Geographic Information Systems (GIS) database for the stormwater system that included the following shapefiles:

- Stormwater points: inlets, outlets, grates, curb inlets, and other drainage features;
- Stormwater outfalls: points along the city boundary where drainage flows out of the City; and
- Stormwater flowlines: culverts, detention basins, open channels, proposed culverts, unchannelized flow, and streams.

Table 10 lists the types of stormwater points included in the received dataset. The stormwater points are displayed in **Figure 11**.

Table 10. Stormwater Point Data

Stormwater Point Type	Number of Stormwater Points
Box	1,195
Box (no manhole)	13
Curb Cut	235
Drop Inlet (no manhole)	6
End of Pipe	1,816
Flow Break	760
Grate	258
Proposed	1
Stormwater Box (no access)	12
Not Assigned	58

Table 11 lists the number of stormwater outfalls owned by the City and by ARDOT. The stormwater outfall points are displayed in **Figure 12**.

Table 11. Stormwater Outfall Data

Outfall Ownership	Number of Outfalls
City of Bryant	199
ARDOT	17

Table 12 lists the stormwater flowline types and the number of each type. The stormwater flowlines are also displayed in **Figure 12**.

Table 12. Stormwater Flowline Data

Stormwater Flowline Type	Number of Flowlines	Length of Flowline Type (ft)
Culvert	2,337	215,727
Detention Basin	1	766
Open Channel	6,026	1,213,335
Proposed Culvert	1	61
Stream	108	53,090
Unchannelized Flow	75	3,825

The culvert lines were reviewed by Garver. In addition to the provided shapefiles for existing culverts within the city limits, Garver identified culvert locations throughout the planning area outside of the city limits. This data was utilized during the initial drainage screening model process that will be discussed later in this report.

According to the received data, the City's stormwater system includes approximately 215,727 feet (40.9 miles) of total culvert length. This dataset includes public roadway crossings, private driveway culverts, and longer underground storm sewer pipes. The provided data also shows over 1.2 million feet (approximately 230 miles) of open channels, which includes roadside ditches and other small channels. In addition to this line type, the data includes a separate category for streams, showing over 53,00 feet (10 miles) of streams within city limits.

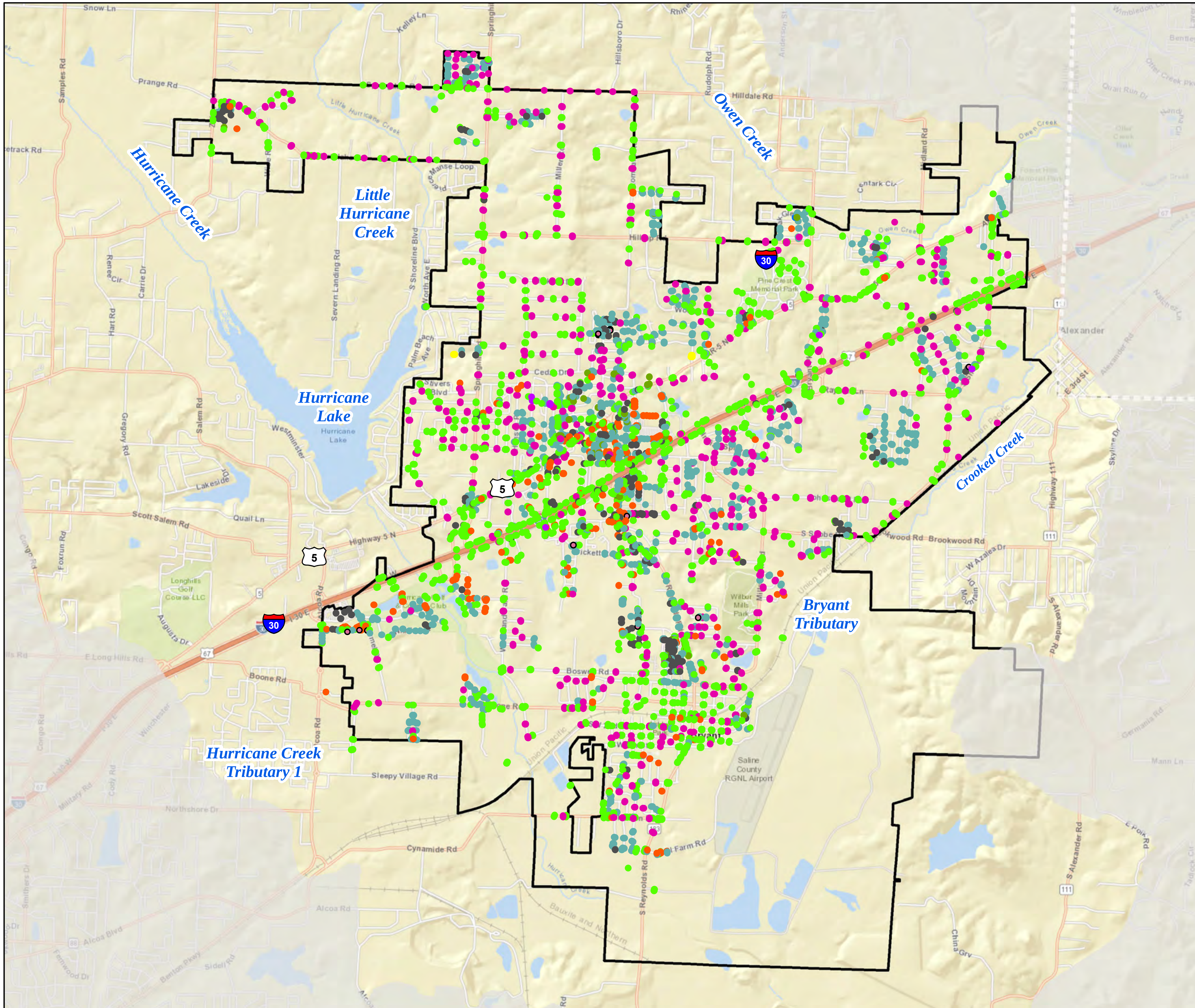


FIGURE 11.

GIS STORMWATER POINT DATA

- BOX
- BOX (NO MANHOLE)
- CURB CUT
- DROP INLET (NO MANHOLE)
- END OF PIPE
- FLOW BREAK
- GRATE
- NOT ASSIGNED
- PROPOSED
- SW BOX - NO ACCESS
- Bryant City Limits

N

0 0.5 1 Miles

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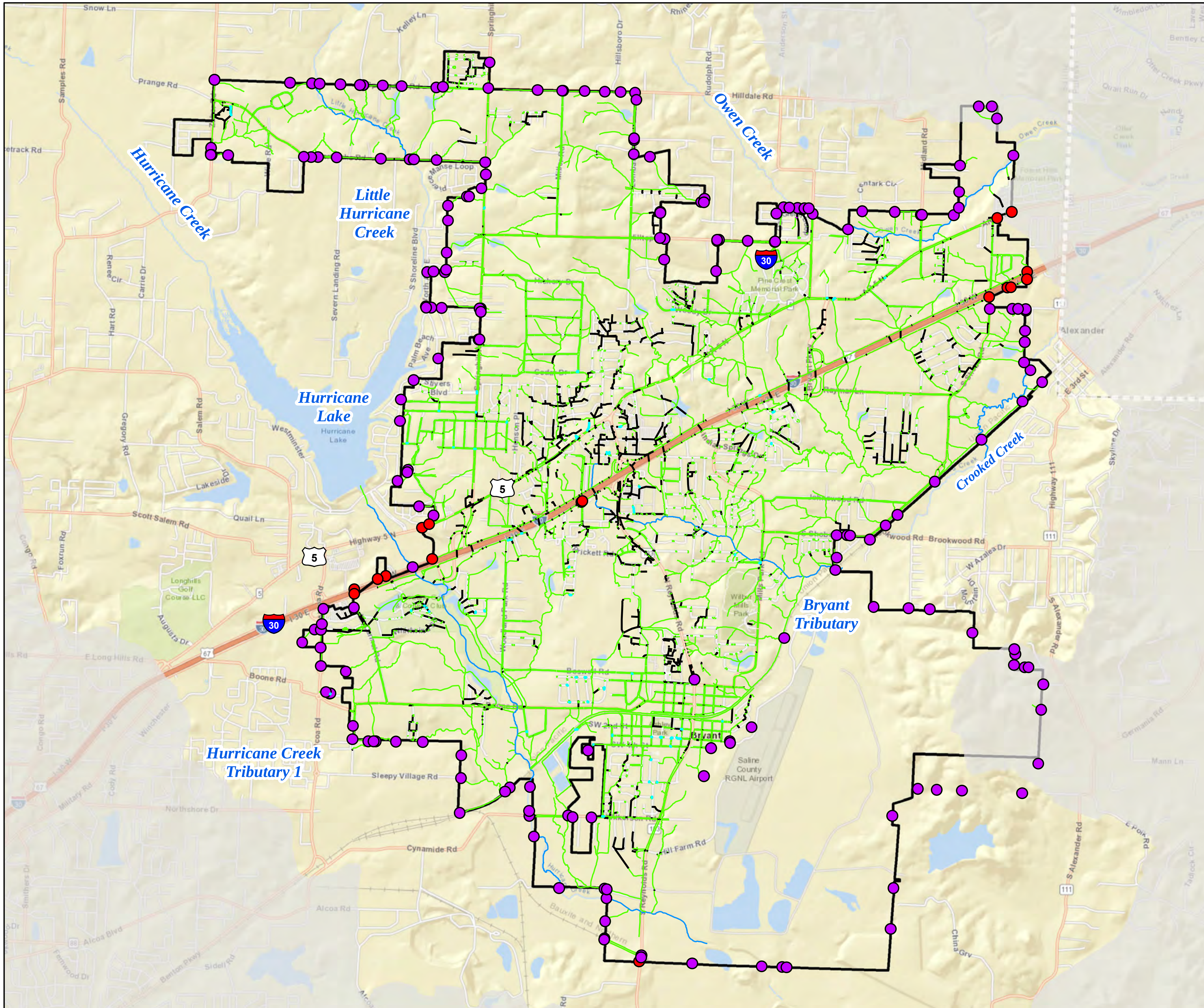

FIGURE 12.

GIS STORMWATER FLOWLINE AND OUTFALL DATA

Ownership

- ARDOT Stormwater Outfalls
- City Stormwater Outfalls
- Culvert
- Detention Basin
- Open Channel
- Proposed Culvert
- Stream
- Unchannelized Flow
- Bryant City Limits

N

0 0.5 1 Miles

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3.5 GIS Data

The following table, **Table 13**, describes the GIS datasets collected for this CDMP, including those mentioned in previous sections of this report. Data was collected from a variety of sources, including the contracted GIS online platform, EFS GeoTechnologies (EFS) and publicly available websites, including the ESRI ArcGIS online platform.

Table 13. Collected GIS Datasets

Dataset	Description	Dataset Source
Bryant City Limits	Current city limit boundary	EFS
City Master Street Plan	Roadway lines and names	EFS
City Planning Area	Current planning area (ETJ)	EFS
City Proposed Zoning	Current proposed zoning map	EFS
City Special Zoning	Special zoning types	EFS
City Stormwater Outfalls	Drainage outfall locations along city limit boundary	EFS
City Stormwater Points	Drainage point locations throughout city limits	EFS
City Zoning Districts	Current existing zoning map	EFS
Saline County Parcels	Current parcel information for county	EFS
Subdivisions	Subdivision boundaries within city planning area	EFS
Average Daily Traffic Counts	Average Daily Traffic (ADT) information for roadways from ARDOT– dataset current through 2019	Arkansas GIS Office
HUC 8 Boundary	Hydrologic Unit Code (HUC) 8 watershed Boundary	USGS
Saline County DFIRM Data	Digital Flood Insurance Rate Map (DFIRM) data for Saline County, including floodplain boundaries, BFE lines, water lines, and other FEMA shapefiles	FEMA Map Service Center
Pulaski County DFIRM Data	Digital Flood Insurance Rate Map (DFIRM) data for Pulaski County, including floodplain boundaries, BFE lines, water lines, and other FEMA shapefiles	FEMA Map Service Center

Dataset	Description	Dataset Source
National Land Cover Data (NLCD)	Land cover dataset from 2019 from Multi-Resolution Land Characteristics Consortium (MRLC)	ESRI
Hydrologic Soil Group (HSG)	Hydrologic soil group (HSG) from Soil Survey Geographic Database (SSURGO)	ESRI
1-meter DEM lidar	1-meter Digital Elevation Model (DEM) lidar topography dataset for project area; data from 2016 USGS Ouachita dataset	Arkansas GIS Office

3.6 Existing Hydrologic and Hydraulic Models

Hydrologic and hydraulic studies have previously been performed for areas within the City of Bryant and the planning area. Available studies were collected and reviewed.

3.6.1 Hurricane Creek Basin Effective Studies

Since Hurricane Creek is a Zone AE mapped floodplain, Effective hydrologic and hydraulic (H&H) studies were available. A FEMA data request was submitted, and Effective data was received from FEMA on March 23, 2022. In addition to hydrologic and hydraulic models, Technical Support Data Notebooks (TSDN) for the Effective hydrologic and hydraulic studies were received. The hydrology TSDN was dated March 31, 2014, and the hydraulic TSDN was dated November 11, 2014.

The received hydrologic study for the Hurricane Creek Basin was performed in HEC-HMS version 3.5. The model extends from the headwaters of the drainage basin down to Highway 183 (Reynolds Road). The received model will be discussed in further detail in Section 4.1 of this report.

Multiple hydraulic models were received for streams in the Hurricane Creek Basin; received studies were both detailed and limited detail. According to the TSDN, detailed studies utilized survey data for structures, while limited detail studies utilized approximate structure data collected field visits. Additionally, while the 10-, 25-, 50-, 100-, and 500-year flood events were studied for the detailed study streams, only the 100- and 500-year events were studied in the limited detail studies. Detailed models were received for Hurricane Creek and Little Hurricane Creek. Limited detailed studies were received for Hurricane Creek Tributary 1, Hurricane Creek Tributary 1A, and Boswell Creek. All received models were performed in HEC-RAS version 4.1. **Table 14** describes the received models and their extents.

Table 14. Received Effective Hydraulic Models for Hurricane Creek Basin

Stream Name	Model Extents	Study Type
Hurricane Creek	From approximately 2,300 feet downstream of Zuber Road to Highway 183	Detailed
Little Hurricane Creek	From just downstream of Northlake Road to confluence with Hurricane Creek/Lake	Detailed
Hurricane Creek Tributary 1	Approximately 650 feet downstream of Winchester Drive to the confluence with Hurricane Creek	Limited Detail
Hurricane Creek Tributary 1A	Approximately 700 feet downstream of Boone Road to confluence with Hurricane Creek Tributary 1	Limited Detail
Boswell Creek	Just downstream of Boswell Road to confluence with Hurricane Creek	Limited Detail

3.6.2 Crooked Creek Basin Effective Studies

The Effective study for Crooked Creek was first described in the FIS Report for the City of Alexander, published on July 20, 1981. It explains that the Effective flows for Crooked Creek were calculated using NOAA Technical Papers 40 and 49, with the 500-year event extrapolated from the other values calculated.

The hydraulic study for Crooked Creek was performed using HEC-2, a hydraulic software that is now outdated. A FEMA data request was submitted, and data was received on April 22, 2022. The received information for Crooked Creek included scanned PDF documents with model input and output for portions of the creek. The scanned document received for Lettered Sections A and B was dated April 15, 1980. The document received for Lettered Sections C through F was dated May 25, 1993. The document received for the portion of Crooked Creek in Pulaski County was dated March 7, 1986.

In addition to scanned documents, a HEC-2 input file was received for the portion of Crooked Creek from Lettered Section C to F. This input file includes cross section geometry and flow data for the creek in this area. Though HEC-2 is an outdated software, the input file can be read in HEC-RAS for modeling purposes.

In addition to Crooked Creek itself, Crooked Creek Tributary, Bryant Tributary, and Trailer Park Ditch are also mapped as Zone AE, suggesting that detailed studies were performed for these streams as well. The 2020 FIS Report states that all three mapped tributaries to Crooked Creek were studied in 1996 using HEC-1 and HEC-2. No model files were received from FEMA for these three streams. The FIS Report only reports the 100-year flow rates; no other storm events are reported.

3.6.3 Owen Creek Basin Effective Studies

According to the 2020 FIS Report, Owen Creek was studied in April 2000 using HEC-1 to determine flow rates and HEC-RAS version 2.2 to determine floodplain extents and WSELs. A FEMA data request was submitted, and data was received on April 22, 2022. Two HEC-RAS models were received; one model includes a plan for running the 10-, 50-, 100-, and 500-year events, and the other models the floodway. The model geometries are not georeferenced. The FIS Report states that Owen Creek is modeled from approximately 1,000 feet upstream of Hilldale Road to the Pulaski County line.

No hydrologic model or data was received as part of the FEMA data request, but the 2020 FIS Report provides flow rates along Owen Creek.

3.7 City Master Plans and Regulations

The City has numerous master plans, regulations, and ordinances that affect drainage. These are described in the sections below.

3.7.1 Stormwater Management Manual

The City has a published Stormwater Management Manual that was adopted on December 17, 2019. According to the manual, its purpose is to “provide minimum standard for analysis, design, construction, and management of storm drainage facilities and pollution prevention” within the City. The general outline of the manual is as follows:

- Section 100: General Provisions
- Section 200: Drainage Planning and Submittal
- Section 300: Storm Water Management Policy
- Section 400: Storm Water Runoff

- Section 500: Open Channel Flow
- Section 600: Storm Sewer Systems
- Section 700: Street Drainage
- Section 800: Storm Inlets
- Section 900: Culverts and Bridges
- Section 1000: Detention Basins
- Section 1100: Sediment and Erosion Control

3.7.2 Stormwater Management Ordinance No. 2019-32/2020-23

The City of Bryant adopted Stormwater Management Ordinance No. 2019-32 and amended the ordinance as No. 2020-23. This ordinance provides minimum requirements for construction site erosion control and stormwater management for existing and future land development. The main purposes of this ordinance are as follows:

1. Protect and preserve waterbodies and their ecosystems from contaminants;
2. Ensure that Best Management Practices (BMPs) are used and maintained;
3. Mitigate flooding, erosion, and sedimentation;
4. Ensure illicit discharge detention and elimination;
5. Assure City compliance with state and federal requirements pertaining to the Federal Clean Water Act.

3.7.3 Saline County Hazard Mitigation Plan

The City of Bryant, along with other communities in the county, participated in the development of the Saline County Hazard Mitigation Plan (HMP), approved on September 14, 2017. The plan lists ways in which each community planned to incorporate the HMP into their own plans. It lists Bryant as anticipating the use of the HMP for the following areas related to stormwater and/or drainage: grant application documentation, subdivision management, budget, and building codes.

The plan lists potential mitigation projects for communities within the county. In order for a project to be receive FEMA funding, it must be included in this list. Two projects listed in the HMP that cover the City of Bryant are the following:

- F-26: Conduct drainage improvements at Stillman Loop, Union Pacific Railroad, and Hidden Creek;
- F-27: Conduct drainage projects in areas inside and outside the floodplain that require larger drainage improvements, elevation of roadway, or any other type of flood mitigation project.

F-27 covers any potential flood mitigation project that the City may want to receive FEMA funding for, including BRIC grant funding. The specific locations in F-26 will be investigated during the project identification task of Phase 1 of this CDMP.

4.0 Hydrology

In order to perform hydraulic analyses during Phase 1 and the subsequent Phase 2 of the CDMP, detailed hydrologic analyses were required throughout the city limits and planning area. The hydrologic analyses of each basin are discussed in the following sections.

4.1 Hurricane Creek Basin Hydrology

As was discussed in Section 3.6.1, the FEMA Effective hydrologic study for Hurricane Creek Basin was performed in HEC-HMS version 3.5. The model extends from the headwaters of the drainage basin down to Highway 183 (Reynolds Road).

Since the Effective model was performed in 2014, the model input was reviewed for ensure that it represents current conditions. It was found that the curve number (CN) and other parameters were still representative of the basin. However, the original model utilized TP-40 precipitation data, as the model was developed prior to the release of NOAA Atlas 14 data. Therefore, the model was updated to utilize Atlas 14 precipitation values. It was also run in the most recent version of HEC-HMS, version 4.10. When compared to the Effective FEMA flow rates, the updated flows were within 1.4% on average, with a maximum difference of 5.3%. **Table 15** provides the updated flows for Hurricane Creek Basin.

Table 15. Updated Summary of Discharges for Hurricane Creek Basin

Location along Stream		Drainage area (sq mi)	Flow Rate (cfs)				
			10-yr	25-yr	50-yr	100-yr	500-yr
Hurricane Creek	Approximately 2,000 feet downstream of Congo Ferndale Road	5.69	2,021	2,612	3,055	3,510	4,606
	Immediately downstream of Samples Road	11.76	3,684	4,910	5,832	6,787	8,962
	Approximately 1,000 feet upstream of Zuber Road	13.85	3,908	5,242	6,250	7,300	9,765
	Hurricane Creek (Upstream of Hurricane Lake)	17.73	5,152	7,013	8,519	10,174	14,138
	Hurricane Lake Outfall	24.88	8,684	11,697	14,076	16,593	22,633
	Immediately upstream of Interstate 30	28.05	10,410	13,967	16,681	19,494	26,550
	Immediately upstream of Boone Road	30.88	10,567	13,995	16,773	19,762	27,051
	Immediately upstream of Cynamide Road	34.55	10,926	14,724	17,687	20,812	28,511
	Immediately upstream of State Highway 183	36.83	10,827	14,825	17,951	21,256	29,353
Little Hurricane Creek	Just downstream of Northlake Road	4.11	2,673	3,431	3,981	4,534	5,798
	Just upstream of Hurricane Lake	6.59	3,778	4,937	5,775	6,654	8,669

4.2 Crooked Creek Basin Hydrology

As described in Section 3.6.2, the Effective flows for Crooked Creek were calculated using NOAA Technical Papers 40 and 49, with the 500-year event extrapolated. However, Garver was contracted to perform an updated hydrologic analysis for the Bryant Parkway project. Garver developed an HEC-HMS model for Crooked Creek from the headwaters to the western Union Pacific Railroad crossing near Trailer Park Ditch. For the CDMP, this model was utilized and extended to the Effective FEMA extents at the Pulaski County line.

Table 16 provides the updated flows for Crooked Creek Basin. Flows determined in the updated Garver model were compared to Effective flows used in the Effective hydraulic model, which included only the 1% AEP event. By comparison, most locations were within 2% of the flow in the Effective model. However, two locations, near the Union Pacific Railroad (west crossing) and Linden Drive, were 10.8% and 17.3% different. The differences in these locations are likely due to the split flow between Crooked Creek and Trailer Park Ditch. Garver conducted a 2-dimensional (2D) hydraulic model of basin that provides a more representative flow distribution in this area. The 2D model will be discussed later in this report.

Table 16. Updated Summary of Discharges for Crooked Creek Basin

Stream Name	Location along Stream	Drainage Area (sq mi)	Flow Rate (cfs)				
			10-yr	25-yr	50-yr	100-yr	500-yr
Crooked Creek	~1,200 feet downstream of Reynolds Road (Hwy 183)	0.49	842	1,007	1,132	1,252	1,519
	~630 feet upstream of Mill Park Road	1.40	2,221	2,687	3,025	3,363	4,151
	At Union Pacific Railroad - West Crossing	2.38	2,834	3,548	4,073	4,598	5,846
	At Linden Drive	3.30	3,494	4,469	5,191	5,923	7,628
	At Brookwood Road	3.49	3,614	4,640	5,403	6,173	7,963
	At Union Pacific Railroad - East Crossing	7.79	5,718	7,427	8,791	10,211	13,586
	At Alexander Road (Hwy 111)	9.71	6,165	8,072	9,613	11,240	15,070
Unnamed Tributary 2	At Highway 5	0.65	848	1,034	1,172	1,309	1,610
	~2,100 feet downstream of I-30	1.45	1,885	2,285	2,579	2,870	3,561
	Tributary at confluence with Crooked Creek (near Shobe Road)	2.68	2,461	3,023	3,442	3,898	4,976
Crooked Creek Tributary	Tributary at confluence with Crooked Creek (at Dell Drive)	0.28	618	736	825	910	1,096
Bryant Tributary	Tributary at confluence with Crooked Creek	0.64	780	993	1,156	1,309	1,659
Trailer Park Ditch	Ditch at confluence with Crooked Creek (at Union Pacific Railroad)	0.21	270	351	414	477	617

4.3 Owen Creek Basin Hydrology

According to Section 3.6.3, the Effective model for Owen Creek was developed in HEC-1. A model was not received as part of the FEMA data request. A new HEC-HMS was developed for the CDMP. **Table 17** provides the updated flows for Owen Creek.

Table 17. Updated Summary of Discharges for Owen Creek Basin

Location along Stream	Drainage Area (sq mi)	Flow Rate (cfs)						
		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
Just downstream of Hillsboro Road	1.45	841	1,170	1,454	1,846	2,147	2,450	3,127
At Hilldale Road (E-W)/ Midland Road	2.46	1,075	1,508	1,909	2,491	2,956	3,424	4,480
Just upstream of Owen Creek Tributary	3.12	1,118	1,600	2,023	2,640	3,131	3,666	4,894
Just downstream of Owen Creek Tributary	4.37	1,817	2,563	3,207	4,162	4,887	5,627	7,375
At Hilldale Road (N-S)	4.54	1,864	2,615	3,263	4,223	4,954	5,732	7,512
At Midland Road	5.26	2,162	2,948	3,552	4,451	5,174	5,924	7,872
Near confluence with Fourche Creek	5.93	2,103	2,907	3,581	4,509	5,257	6,078	8,095

Flows calculated in the HEC-HMS model were compared to those published in the Effective FIS Report for Owen Creek. Published flows for the 1% AEP were on average about 22% greater than Effective flows. All published flows were less than those calculated in the HEC-HMS model. Differences in calculated and published values are most likely due to a combination of reasons, including significant development in the drainage basin since the original calculations were performed and changes in calculation methodologies between HEC-1 and HEC-HMS.

5.0 Initial Drainage Study Screening

An initial drainage study screening was performed for the City and planning area. This was done by developing a simplified 2D hydraulic model of each subbasin. The purpose of these models was to understand the overall flow patterns of each basin, develop flood mapping for multiple storm events for the entire City, and quantify flood risk by developing a flood severity index. The results of the severity index were then combined with results from the resident drainage issue database to identify locations for further study in Phase 2 of the CDMP.

The initial screening models were developed for each major basin, with one model for each of the following basins:

- Little Hurricane Creek
- Hurricane Creek
- Crooked Creek
- Owen Creek

The modeling methods and assumptions are described in the following section.

5.1 Methodology

The initial screening models were developed using a 2D hydraulic modeling software generated in U.S. Army Corps of Engineers' (USACE) HEC-RAS software version 6.2. As the developed models are intended to understand overall drainage patterns and identify potential problem locations, the model geometries were simplified to meet this purpose. Therefore, the developed screening models utilize lidar topography to represent all hydraulic structures, and culverts and bridges were not explicitly modeled. This approach is common for watershed-based modeling; more detailed modeling will be conducted in Phase 2 for design purposes.

5.1.1 2D Mesh Development

The 2D mesh for each model was structured so that the elements are larger outside of the floodplain and in higher elevations, which are less likely to be inundated during the model simulations. The element density is generally the greatest at bridge openings, roadway embankments, and major streams. A finer mesh (more nodes and elements) will lead to longer model runtimes (the time it takes to process results). The mesh for each model was developed to produce acceptable results but minimize excessive runtimes. The mesh contains cells with a minimum cell size of 15 feet and a maximum cell size of 60 feet.

The main channels were represented with rectangular adaptive mesh elements that are generally elongated in the direction of flow along the channels. Likewise, roadway embankments are generally represented by quadrilateral elements. The remainder of the mesh is composed of hexagonal non-adaptive elements. Breaklines were drawn along the thalweg of smaller channels to ensure that the channels were represented in the mesh. Breaklines were also used to define significant changes in topography and to adjust the mesh density where appropriate.

5.1.2 Surface Terrain Data

The terrain data for the 2D model was built from 2016 USGS Ouachita dataset 1-meter Digital Elevation Model (DEM) lidar topography. This elevation data is publicly available through the Arkansas GIS Office. Because the models were built for screening uses and not design, detailed crossing structure data was not used. Instead, the terrain was modified to include channels through the roadway with the same structure width observed in aerial imagery. This allows flow to pass while still showing the ponding effects at crossings.

5.1.3 Curve Numbers

Since the model uses rain-on-mesh methodology, infiltration needed to be represented. The SCS Curve Number Method was utilized as the infiltration method. Curve numbers (CN) were determined using aerial imagery, USGS hydrologic soil groups, and the 2019 National Land Cover Database (NLCD), available from USGS. This dataset was checked against the most current aerial imagery and updated as needed to reflect any newly developed areas. A 10-foot resolution CN raster was used as an input for the model.

5.1.4 Manning's Roughness Coefficients

The roughness coefficients for the project domain were set using a Manning's *n* gridded dataset. The land use types and corresponding Manning's *n* roughness coefficients are listed in **Table 18**. The Manning's *n* values used for the non-channel areas were derived from the HEC-RAS Users' Manual as well as the modeler's previous experience with rain-on-mesh 2D models.

Table 18. Screening Model Land Use Types and Roughness Coefficients

Land Use Type	Manning's *n* Value
Channel	0.05
Developed, Low Intensity	0.0678
Emergent Herbaceous Wetlands	0.1825
Developed, High Intensity	0.0404
Cultivated Crops	0.037
Developed, Medium Intensity	0.0678
Developed, Open Space	0.0404
Deciduous Forest	0.36
Evergreen Forest	0.32
Mixed Forest	0.4
Herbaceous	0.368
Hay-Pasture	0.325
Shrub-Scrub	0.4
Woody Wetlands	0.086
Barren Land	0.0113

5.1.5 Boundary Conditions

The 5-, 10-, 50-, and 100-year storms were analyzed in unsteady flow conditions with rain-on-mesh precipitation. A 1-minute interval precipitation hyetograph for each storm event was generated in HEC-HMS using NOAA Atlas 14 data. The Atlas 14 rainfall values utilized for the City were discussed in Section 3.1.2.2, with values in **Table 2**. The downstream boundary conditions for each model were set to normal water surface elevation (WSEL) with a downstream energy-grade slope that was estimated from lidar data in the downstream channel bottom slope.

5.1.6 Model Controls

Each model was set to run for three days to allow the hydrographs to peak and reach their descending limb. The time step was controlled by courant condition. Arbitrary start dates and times were selected. Diffusion Wave was used for the governing 2D hydraulic equations.

5.2 Initial Screening Model Results

The results of the 2D models were reviewed to determine the existing flow patterns throughout the City. To identify existing drainage deficiencies, a flood severity index was developed based on the 2D model results. Flood depth and velocity were used to determine flood severity levels.

The hydraulic parameters were calculated in the HEC-RAS sub-program RASMapper and categorized using the flood severity index described in **Table 19** and **Figure 13**.

Table 19. Flood Severity Index Classes

Class	Description	Depth *y* (ft)	Velocity *v* (ft/s)
FS0	Minimal severity	< 0.5	-
FS1	Unsafe for vehicles and pedestrians	< 1.5	< 6.0
FS2	Moderate flooding hazard for buildings	< 3	< 6.0
FS3	Potential for structural damage	> 3	< 6.0
FS4	Unsafe for vehicles and pedestrians; Potential for structural damage	> 0.5	>6.0

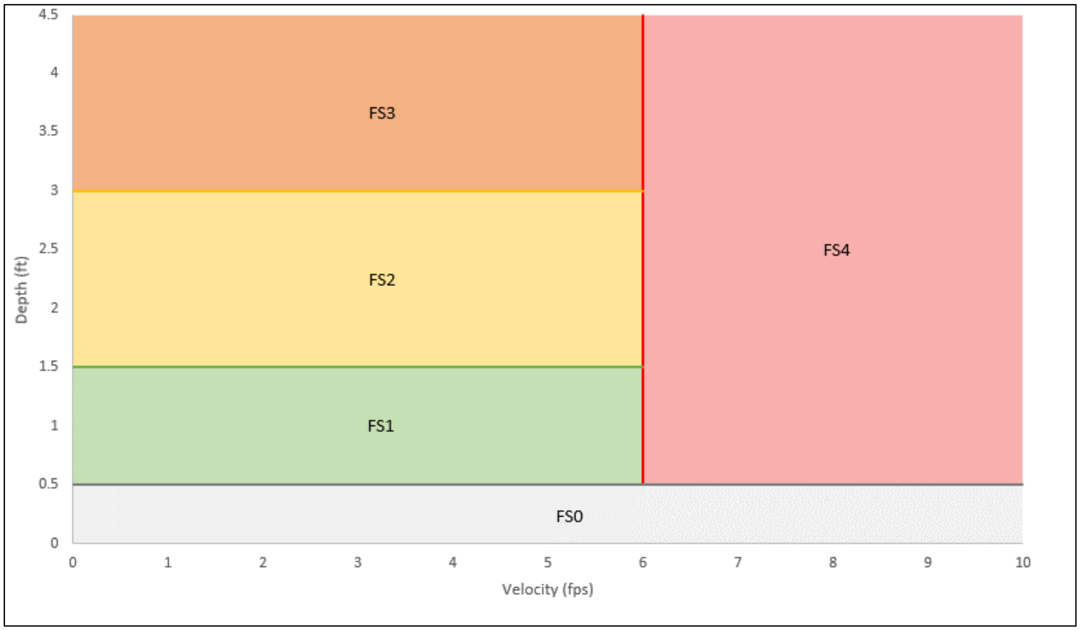


Figure 13. Flood Severity Index Graph

The flood severity for each basin was plotted for the 5-, 10-, 50-, and 100-year events. This allowed for severity to be plotted for more frequent events as well as the less frequent, larger storm events. The flood severity for the four analyzed events in the lower Hurricane Creek Basin are mapped in **Figure 14** through **Figure 17**. Because of the selected modeling boundary, Little Hurricane Creek Basin was modeled separately. The four analyst events for Little Hurricane Creek Basin are mapped in **Figure 18** through **Figure 21**. Crooked Creek Basin is mapped in **Figure 22** through **Figure 25**, and Owen Creek Basin in **Figure 26** through **Figure 29**.

FIGURE 14. HURRICANE CREEK BASIN 5-YEAR FLOOD SEVERITY INDEX

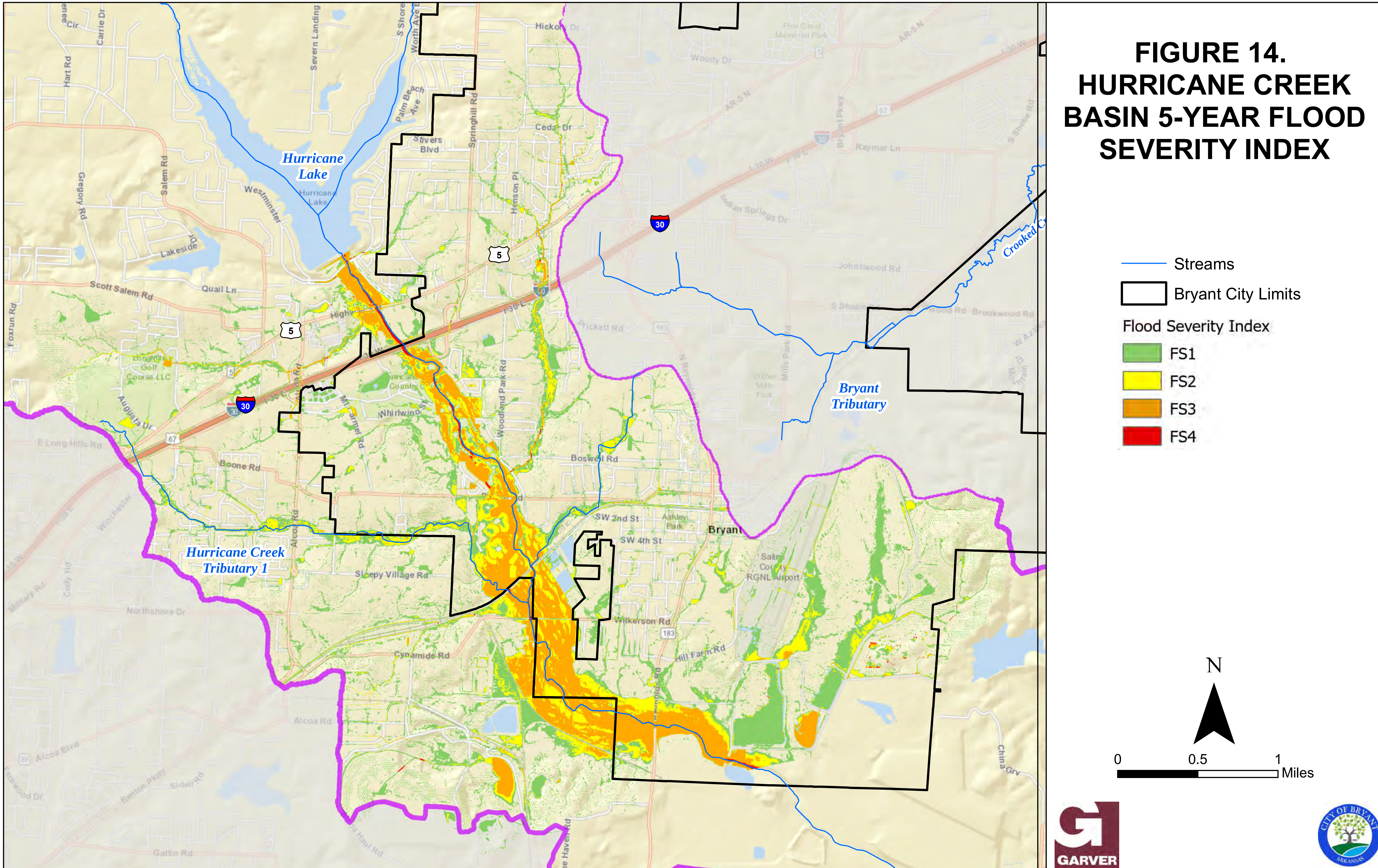
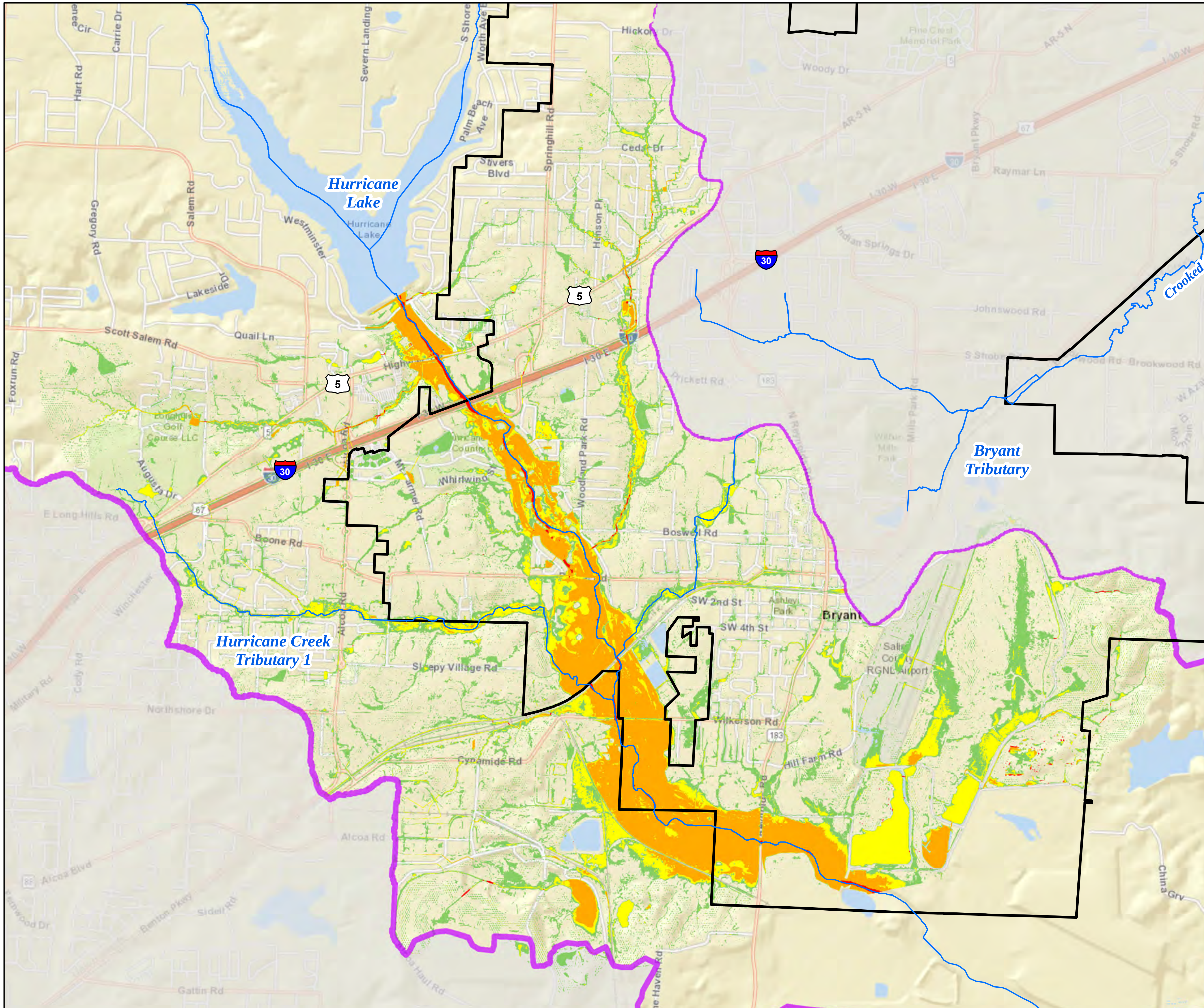


FIGURE 15. HURRICANE CREEK BASIN 10-YEAR FLOOD SEVERITY INDEX



- Streams
- Bryant City Limits

Flood Severity Index

- FS1
- FS2
- FS3
- FS4

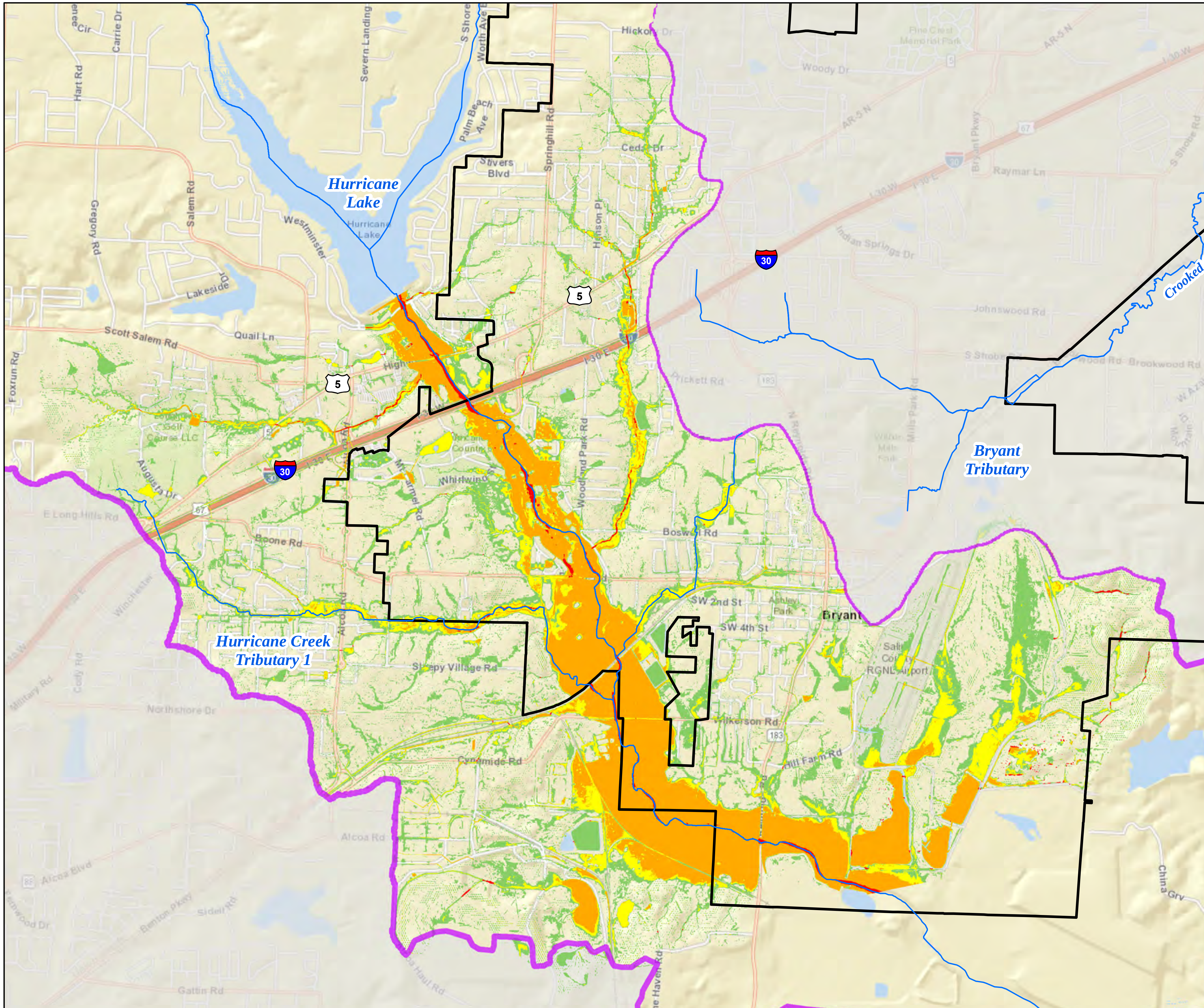
N

0 0.5 1 Miles

GARVER

CITY OF BRYANT ARKANSAS

FIGURE 16. HURRICANE CREEK BASIN 50-YEAR FLOOD SEVERITY INDEX



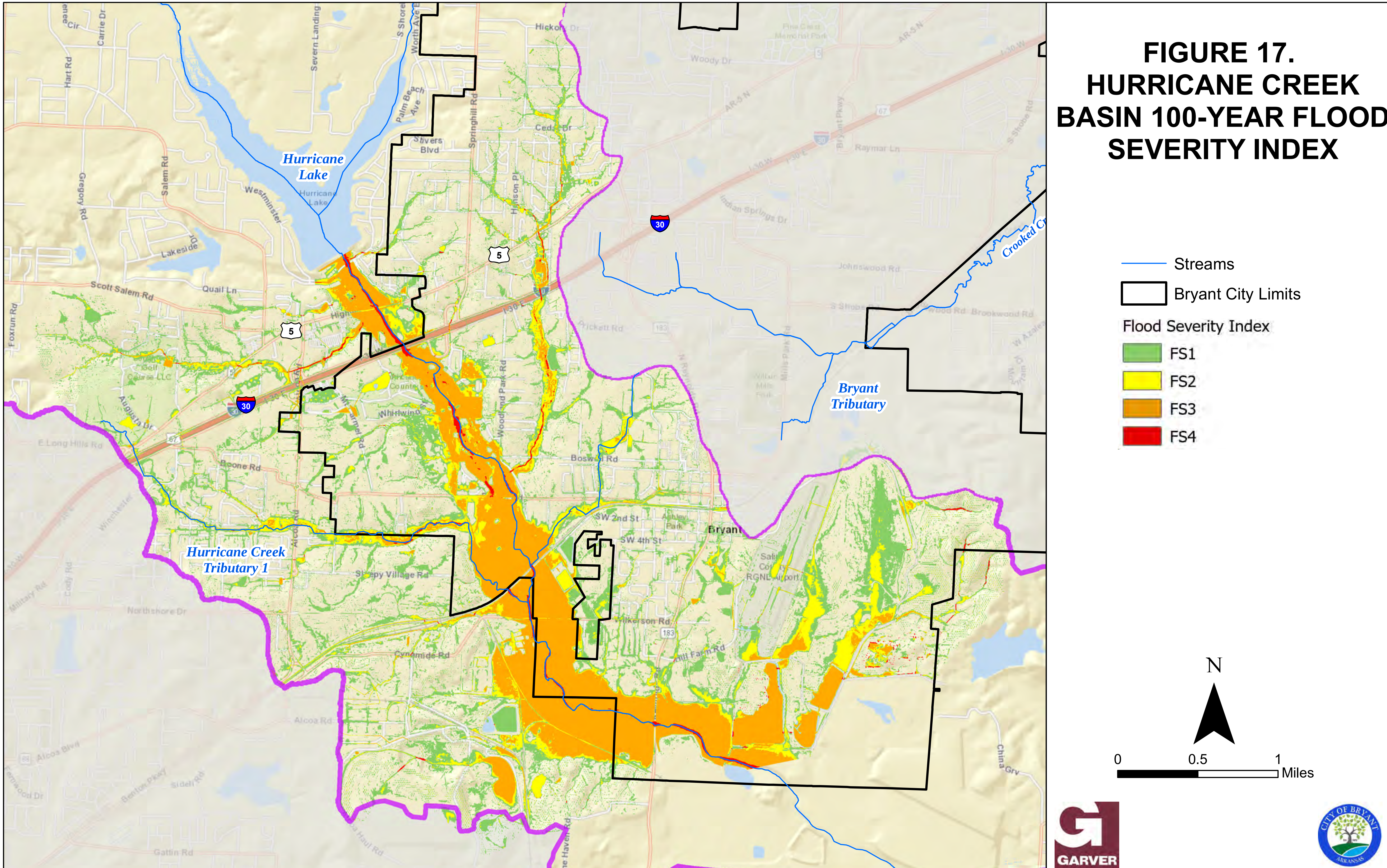


FIGURE 17. HURRICANE CREEK BASIN 100-YEAR FLOOD SEVERITY INDEX

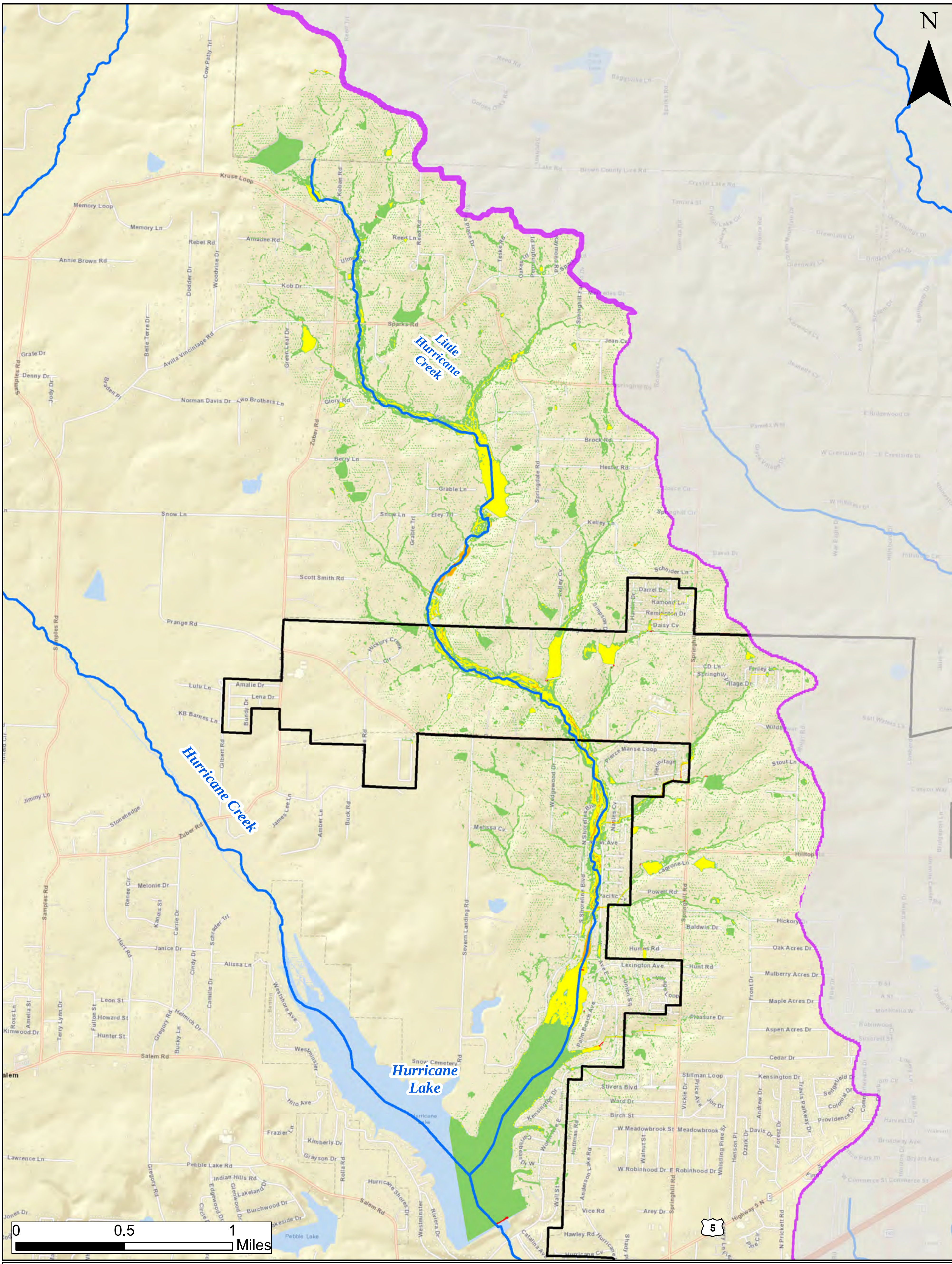


FIGURE 18.
LITTLE HURRICANE CREEK
BASIN 5-YEAR FLOOD SEVERITY INDEX

Flood Severity Index

- Streams
- Bryant City Limits
- FS1
- FS2
- FS3
- FS4

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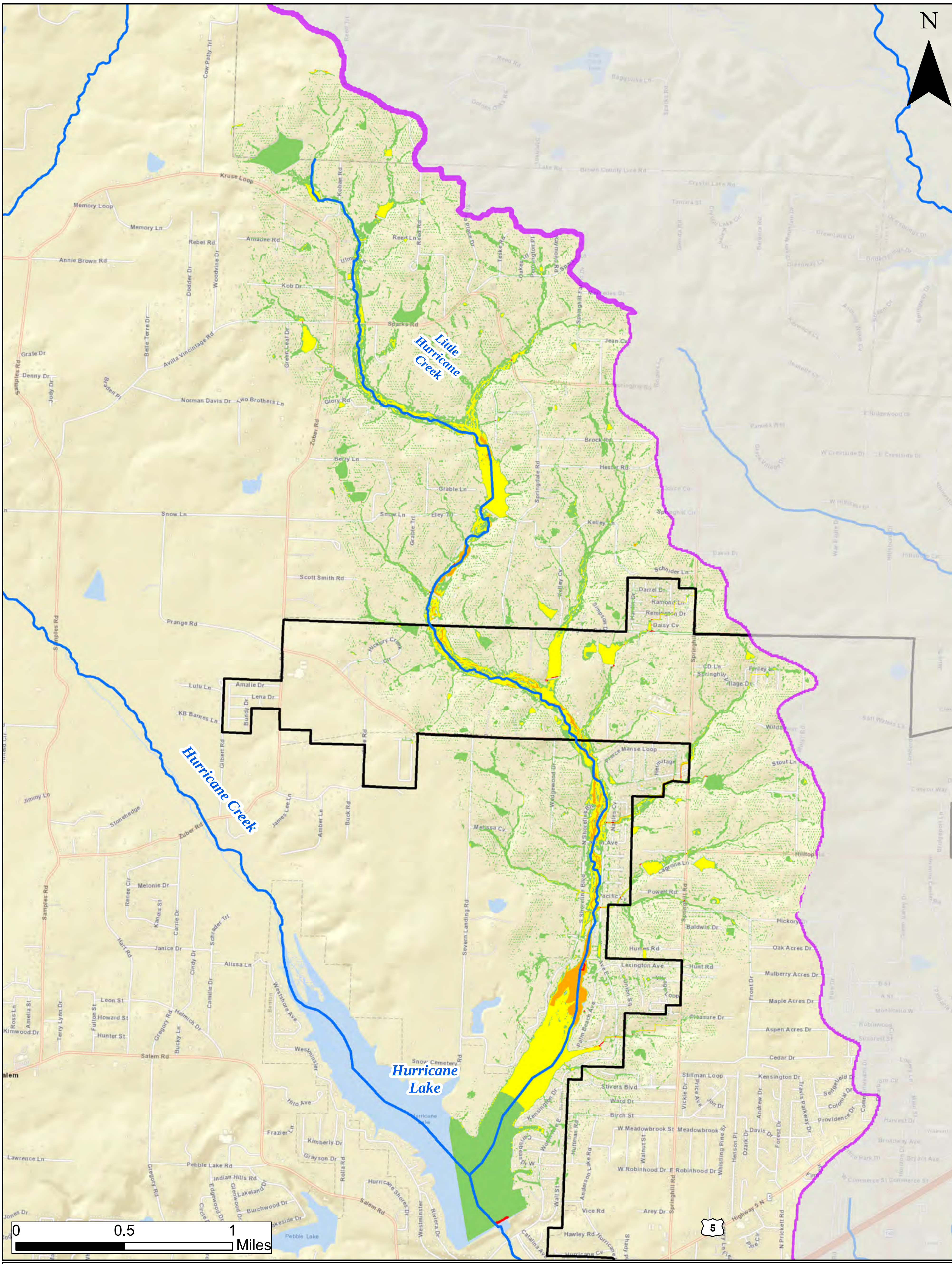

FIGURE 19.
LITTLE HURRICANE CREEK
BASIN 10-YEAR FLOOD SEVERITY INDEX

Flood Severity Index

Streams

Bryant City Limits

FS1

FS2

FS3

FS4

GARVER

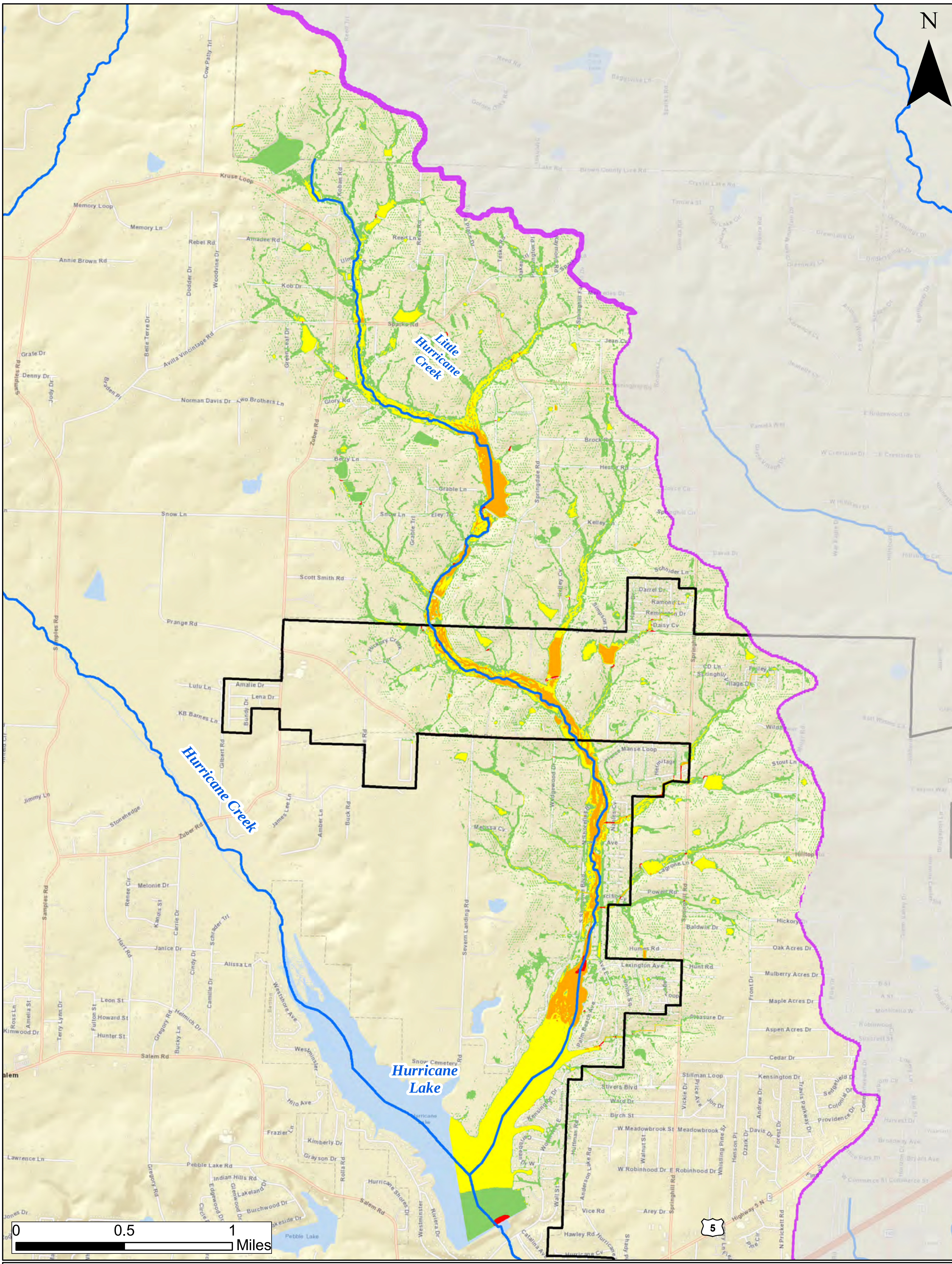

FIGURE 20.
LITTLE HURRICANE CREEK
BASIN 50-YEAR FLOOD SEVERITY INDEX

Flood Severity Index

Streams
Bryant City Limits
FS1
FS2
FS3
FS4

GARVER

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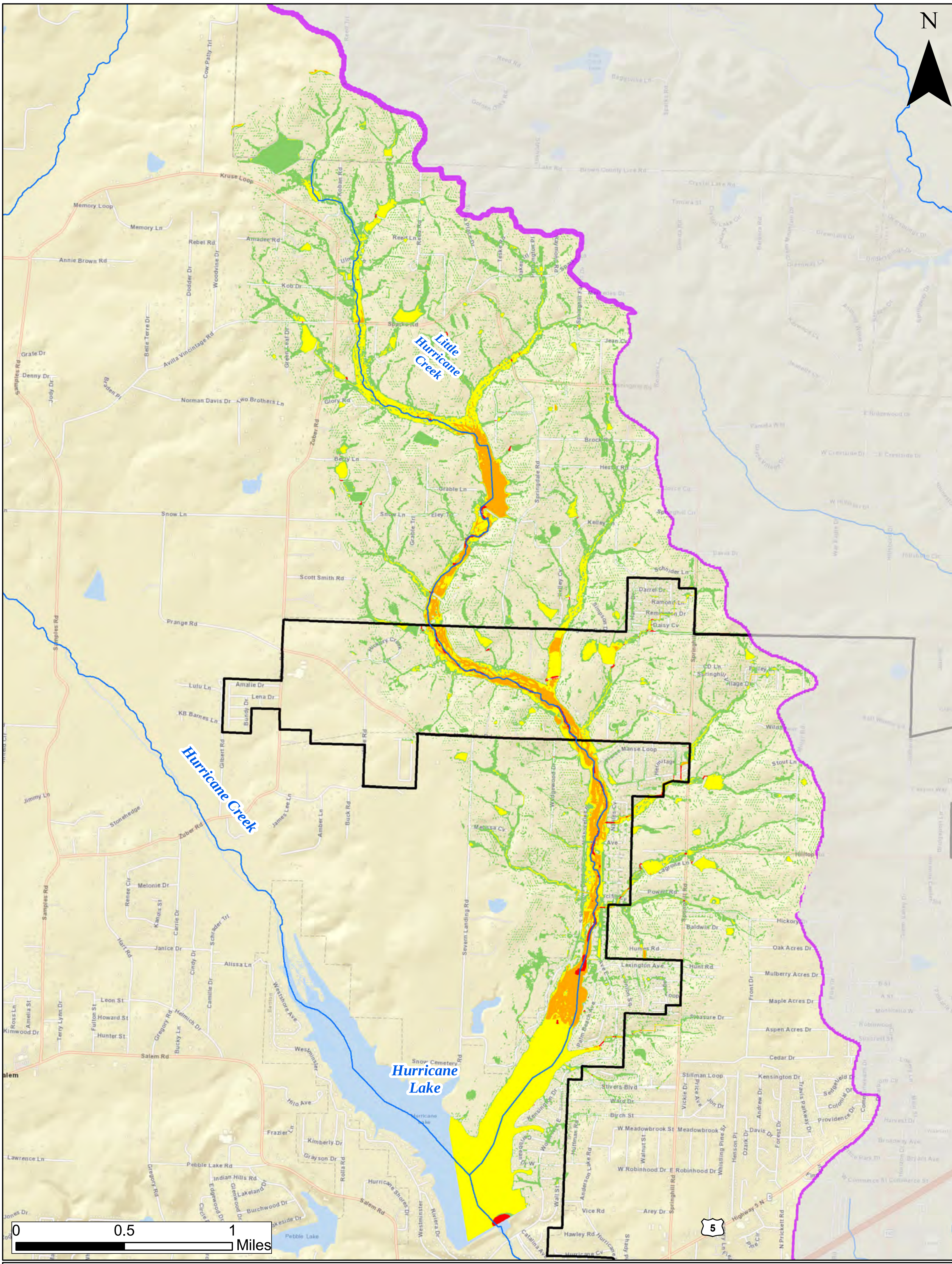


FIGURE 21.
LITTLE HURRICANE CREEK
BASIN 100-YEAR FLOOD SEVERITY INDEX

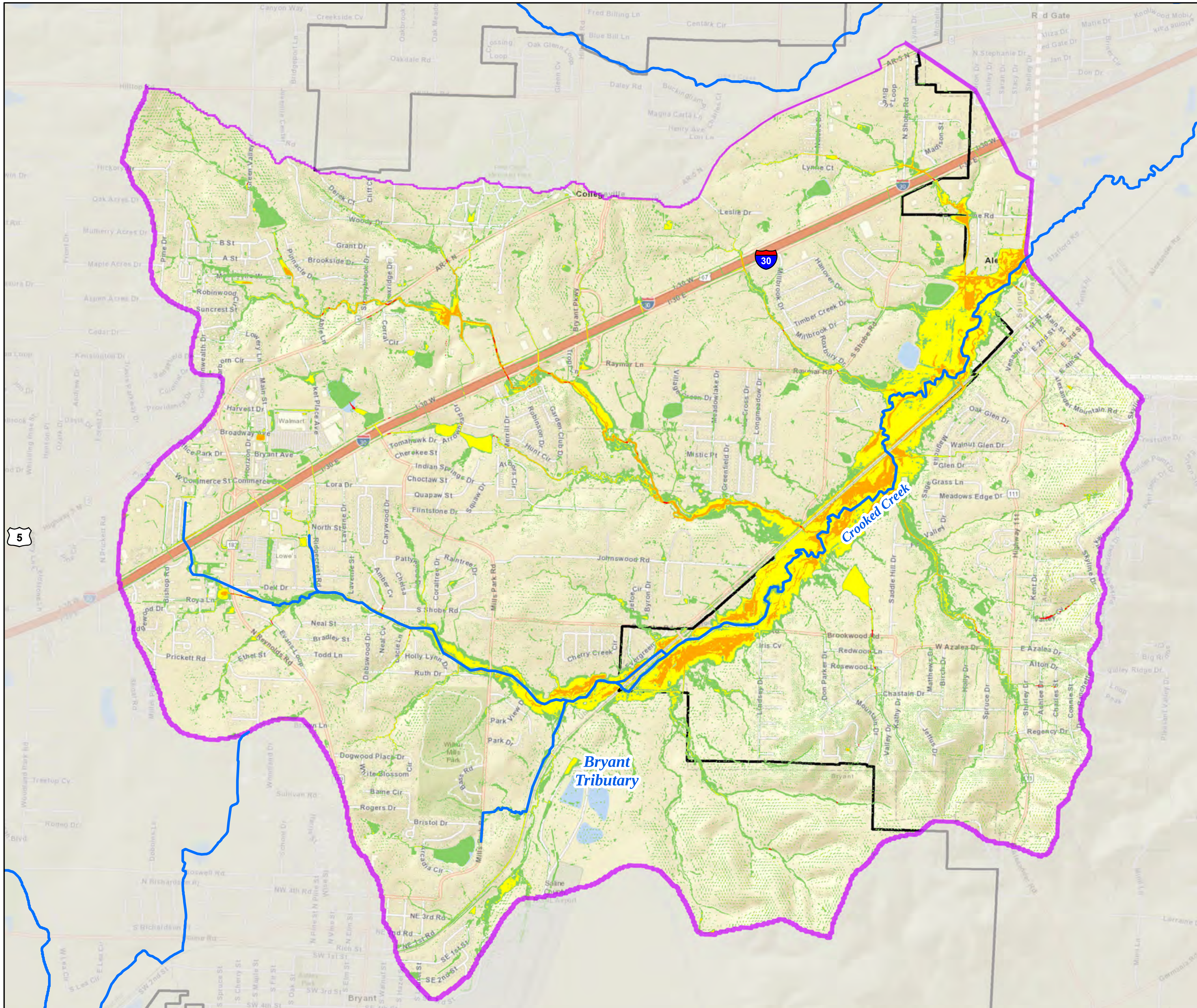
Flood Severity Index

Streams
Bryant City Limits
FS1
FS2
FS3
FS4

GARVER

CITY OF BRYANT ARKANSAS

FIGURE 22. CROOKED CREEK BASIN 5-YEAR FLOOD SEVERITY INDEX



Streams

Bryant City Limits

Flood Severity Index

FS1

FS2

FS3

FS4

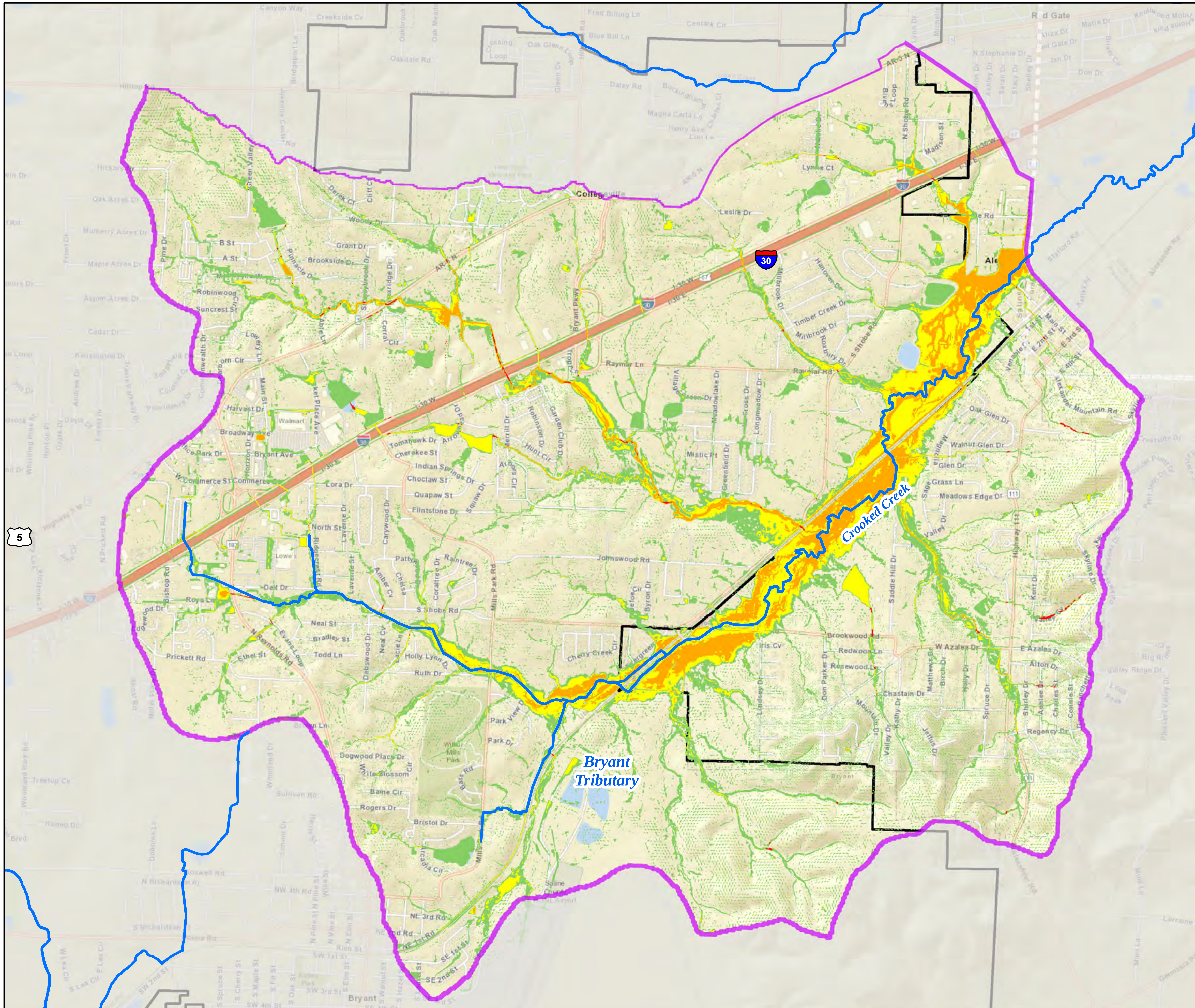
N

0 0.5 1 Miles

GARVER

CITY OF BRYANT ARKANSAS

FIGURE 23. CROOKED CREEK BASIN 10-YEAR FLOOD SEVERITY INDEX



Streams

Bryant City Limits

Flood Severity Index

FS1

FS2

FS3

FS4

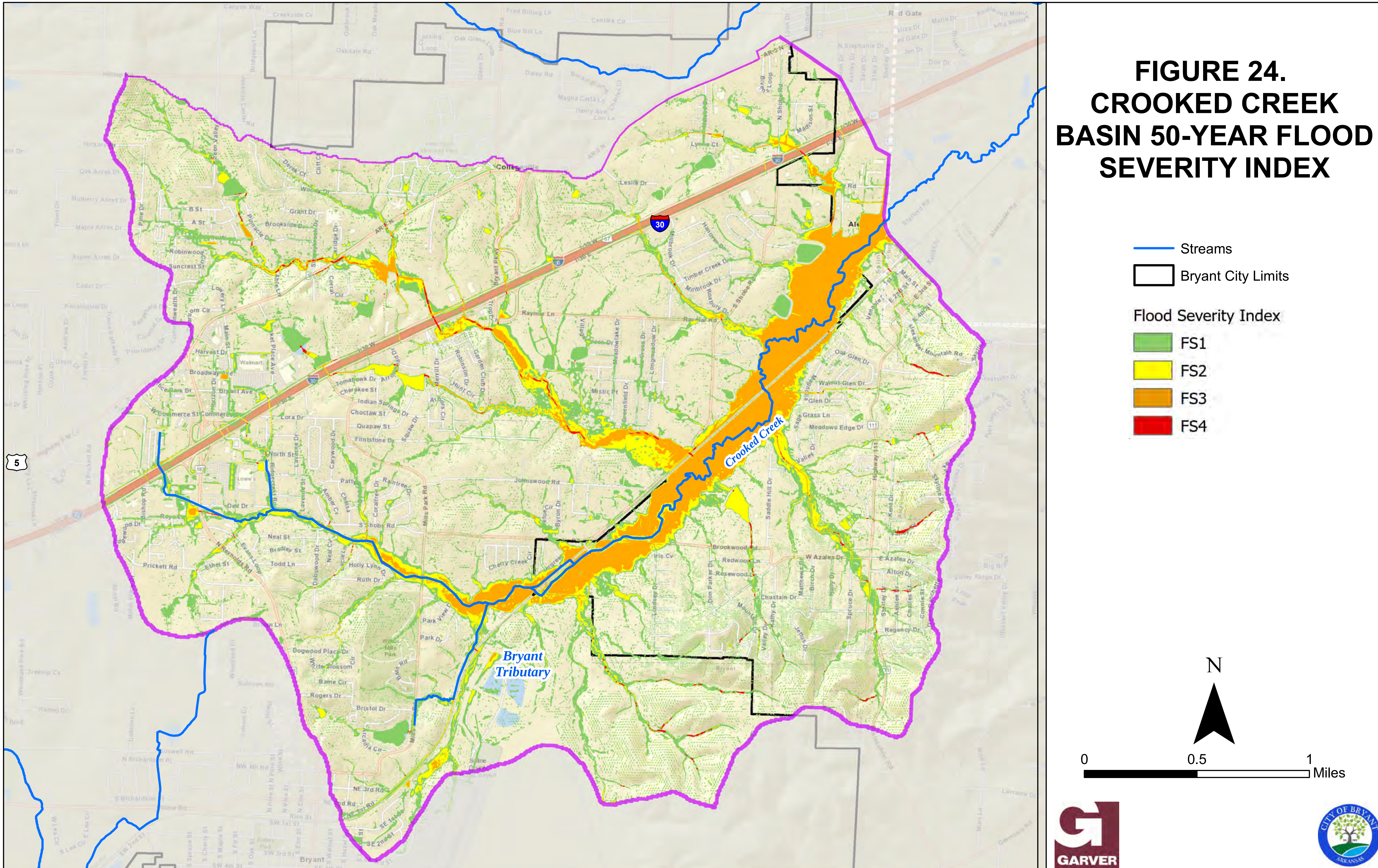
N

0 0.5 1 Miles

GARVER

CITY OF BRYANT ARKANSAS

FIGURE 24. CROOKED CREEK BASIN 50-YEAR FLOOD SEVERITY INDEX



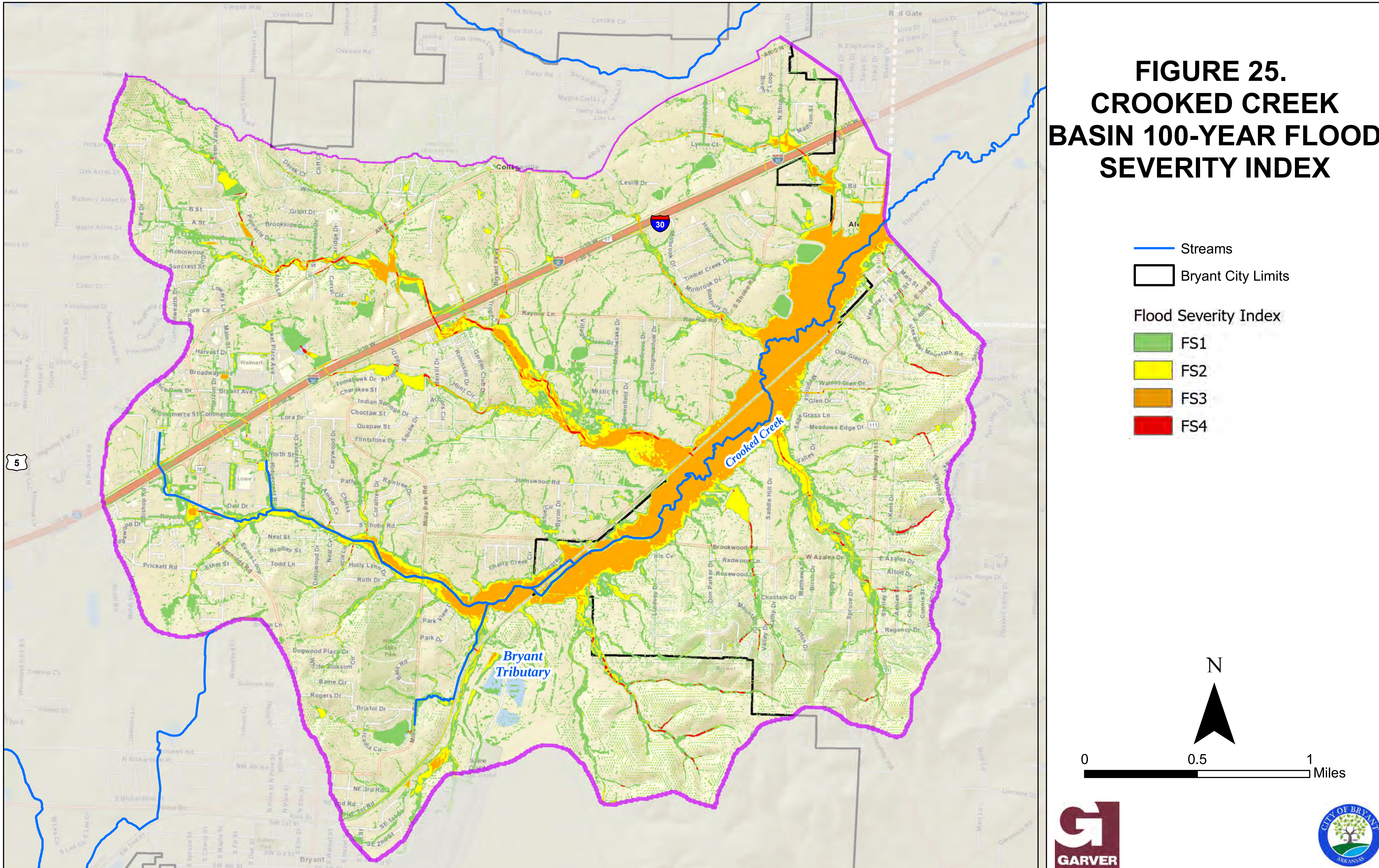


FIGURE 25. CROOKED CREEK BASIN 100-YEAR FLOOD SEVERITY INDEX

FIGURE 26. OWEN CREEK BASIN 5-YEAR FLOOD SEVERITY INDEX

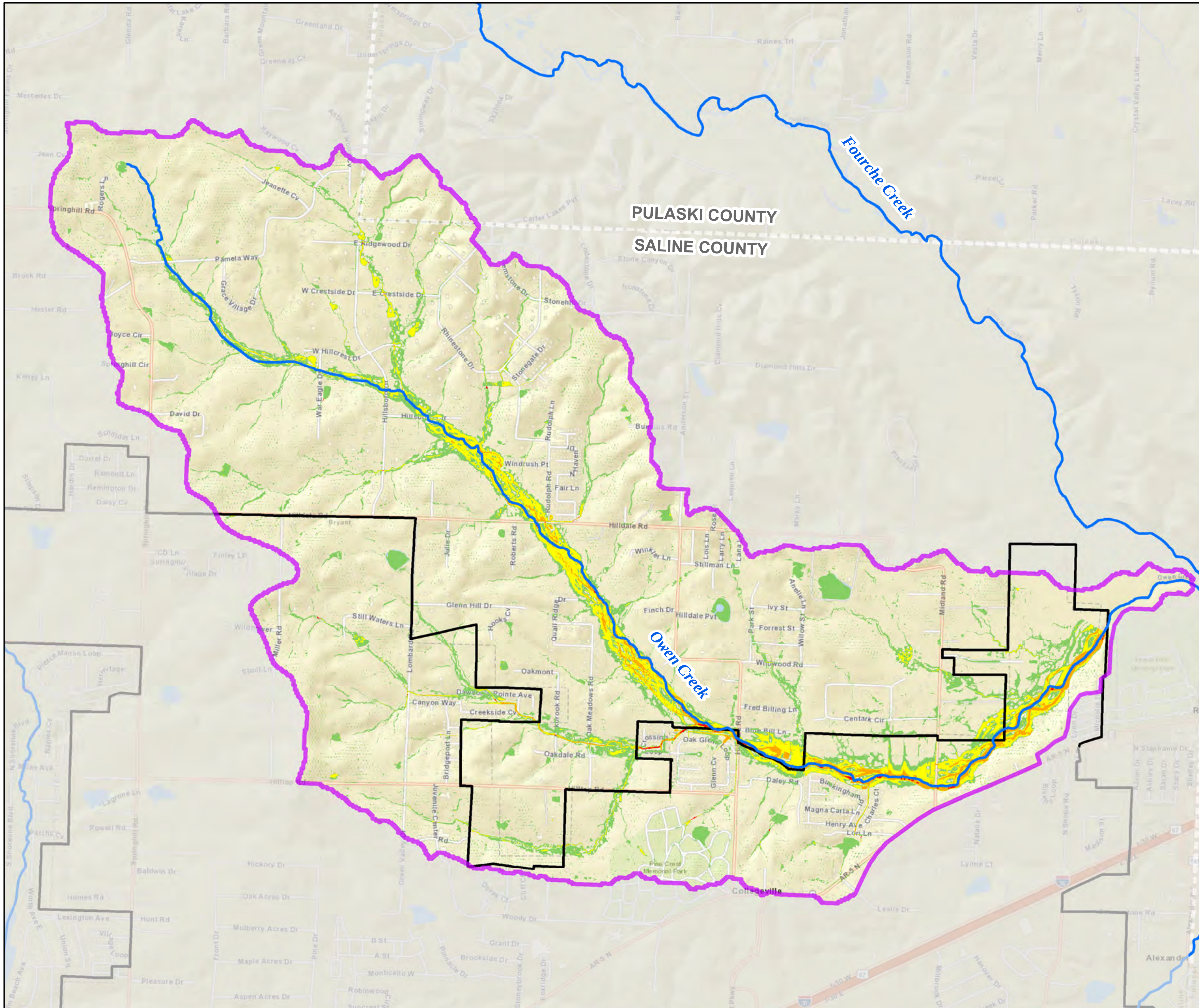
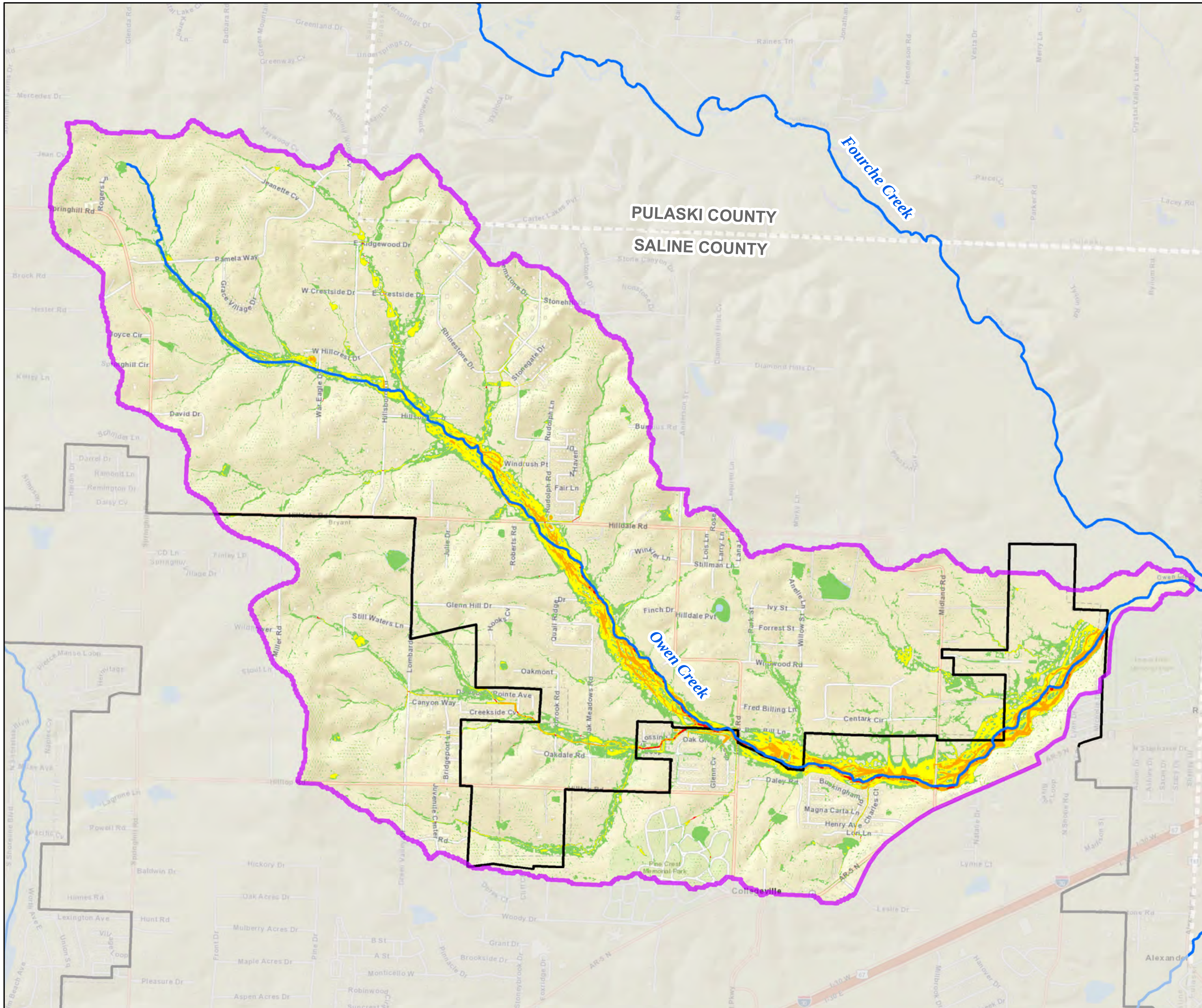


FIGURE 27.
OWEN CREEK BASIN 10-YEAR FLOOD SEVERITY INDEX



Streams
Bryant City Limits
Flood Severity Index
FS1
FS2
FS3
FS4

N

0 0.5 1 Miles

GARVER

CITY OF BRYANT ARKANSAS

FIGURE 28. OWEN CREEK BASIN 50-YEAR FLOOD SEVERITY INDEX

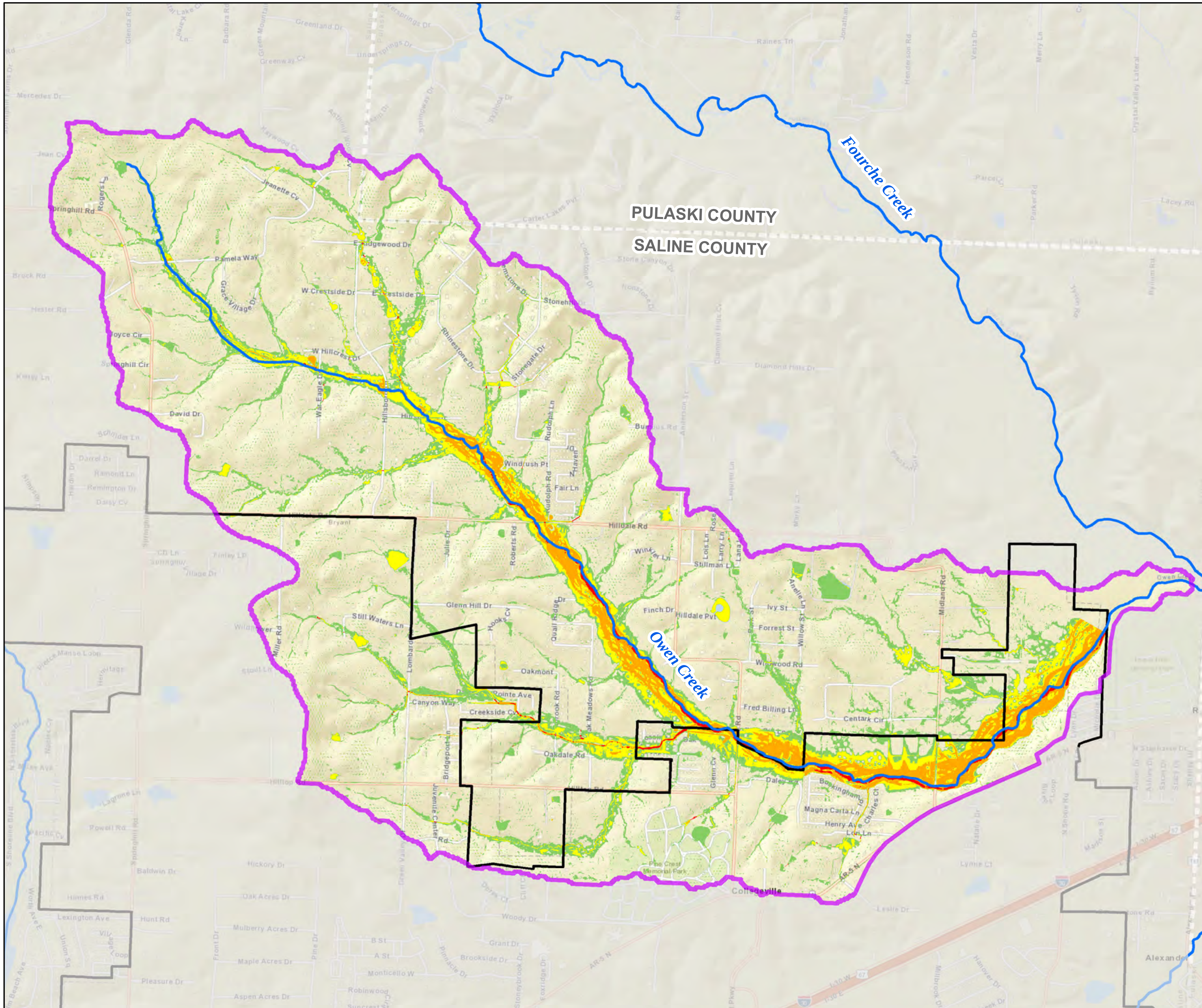
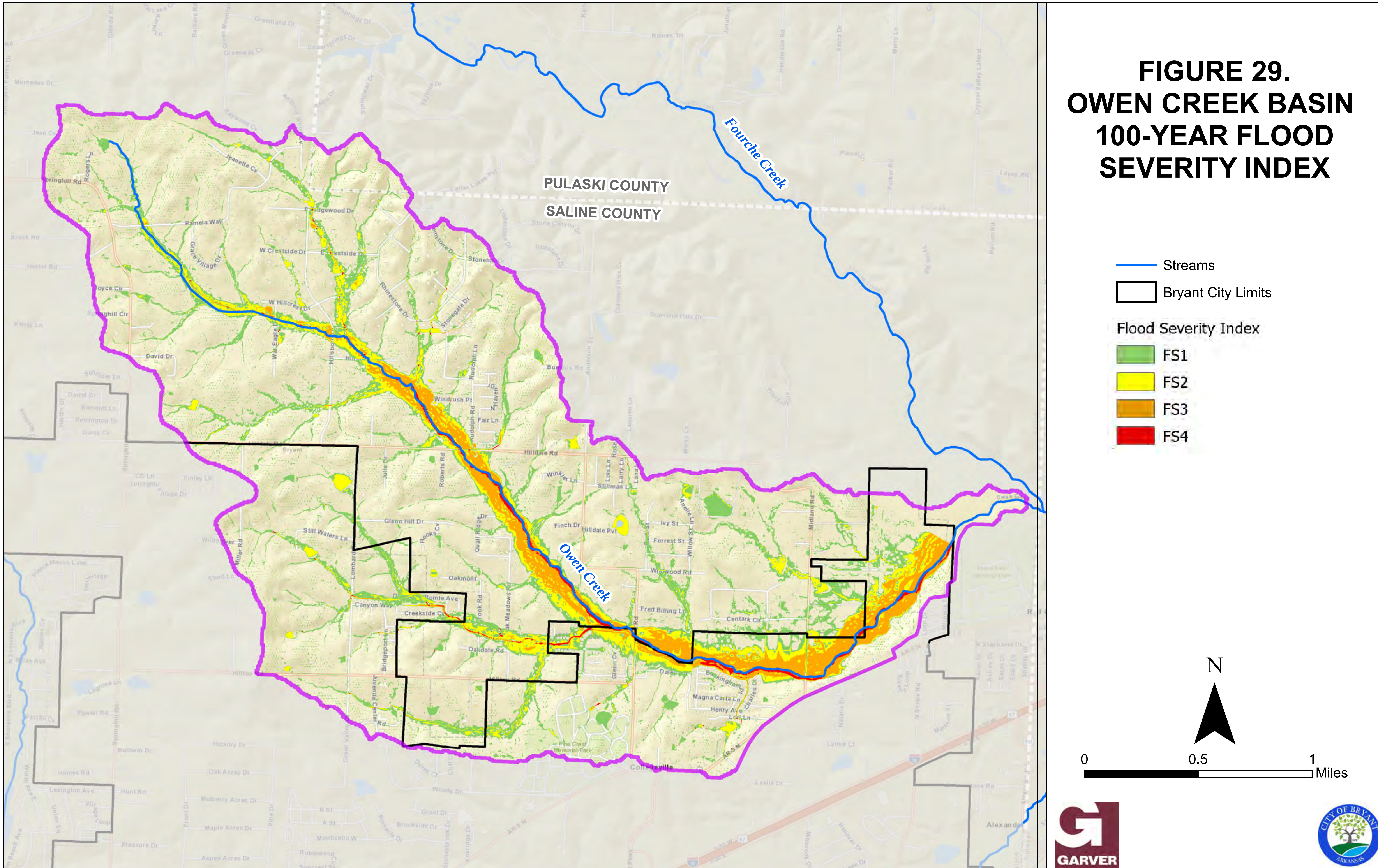


FIGURE 29. OWEN CREEK BASIN 100-YEAR FLOOD SEVERITY INDEX



5.3 Areas For Further Study

The mapping provided in the previous section was reviewed to identify areas of concern. Locations within the flood severity mapping for all modeled storm events were reviewed against aerial imagery and lidar data. Parameters considered during the problem area identification process included the following:

- Roadway overtopping by any storm event;
- Inundation of home or other building by any storm event;
- Identification of drainage issue by resident comment;
- Documentation of historic flooding, as discussed in Section 3.1.1 of this report;
- Roadway or home/building located within a FEMA flood hazard mapped area.

If a location was initially identified by one or more of the parameters listed above, the area was then reviewed further to determine if it warranted further study. Initially, 38 locations were identified. These locations were provided to the City for discussion, including verification of potential drainage problems. After City verification, the list was reduced to 16 locations for further study. These locations are listed in **Table 20.**

Table 20. Identified Potential Drainage Problem Locations

ID	Location	Stream Name	Basin	Potential Drainage Issue	Flood Severity Index				Resident Comments
					5 yr	10 yr	50 yr	100 yr	
5	Sherwood Estates/ Northridge Ph 2/Forest Cove/Springhill Manor	Unnamed Tributary to Shoal Creek	Hurricane Creek	Neighborhood flooding	1	1	1	2	7
6	Forest Cove/Sunset Meadows	Shoal Creek	Hurricane Creek	Neighborhood flooding	1	1	2	2	10
7	Hidden Creek Drive	Shoal Creek	Hurricane Creek	Roadway overtopping; home flooding	1	1	2	2	3
8	Rodeo Drive	Shoal Creek	Hurricane Creek	Home flooding	1	2	2	2	1
10	Boone Road	Hurricane Creek	Hurricane Creek	Roadway overtopping; home flooding	2	3	3	3	0
12	Boone Road (near Richardson Place)	Boswell Creek	Hurricane Creek	Roadway overtopping; home flooding	1	1	2	2	1
13	Lea Circle	Boswell Creek	Hurricane Creek	Roadway overtopping; home flooding	3	3	3	3	3
14	Cynamide Road	Hurricane Creek	Hurricane Creek	Roadway overtopping	0	2	2	3	0
18	Meadowlake	Unnamed Tributary to Crooked Creek	Crooked Creek	Neighborhood flooding	2	2	2	2	5

ID	Location	Stream Name	Basin	Potential Drainage Issue	Flood Severity Index				Resident Comments
					5 yr	10 yr	50 yr	100 yr	
19	Meadowlake	Unnamed Tributary to Crooked Creek	Crooked Creek	Neighborhood flooding	1	1	1	2	0
21	S. Shobe Road	Unnamed Tributary to Crooked Creek	Crooked Creek	Roadway overtopping	1	1	2	3	0
27	Hilldale Road N-S (near Hilltop)	Owen Creek	Owen Creek	Roadway overtopping; home flooding	1	2	2	2	2
28	Midland Road	Owen Creek	Owen Creek	Roadway overtopping	0	0	1	1	0
29	Oak Meadows\ Roman Heights\ Dawsons Pointe	Owen Creek Tributary	Owen Creek	Neighborhood flooding	1	2	3	4	2
30	Oak Glenn	Owen Creek Tributary	Owen Creek	Neighborhood flooding; home flooding	1	2	2	3	6
32	Richardson Place	Boswell Creek	Hurricane Creek	Roadway Overtopping	1	1	1	1	2

6.0 Phase 2 Recommendations

The following tasks will be performed in Phase 2 of the CDMP:

- Detailed existing conditions hydraulic analysis of selected study areas;
- Development of improvement alternatives for identified drainage issues;
- Hydraulic analysis of improvement alternatives;
- Development of Capital Improvement Plan with project prioritization and conceptual costs.

The locations identified in Table 20 were grouped as applicable for modeling purposes in Phase 2. Table 21 lists the recommended models to develop in Phase 2. Phase 2 deliverables will include drainage study reports for each model listed above, along with conceptual layouts of the selected mitigation alternatives and planning level opinions of project costs.

Table 21. Recommended Hydraulic Models for Phase 2

Stream/Location	Model Extents	Model Type
Shoal Creek	confluence with Hurricane Creek up to Kensington Drive	1D HEC-RAS
Shoal Creek Tributary	confluence with Shoal Creek up to Kensington Drive	1D HEC-RAS
Hurricane Creek	Highway 183 to Hurricane Lake	1D and 2D HEC-RAS (Boone Road portion performed during Phase 1)
Boswell Creek	Confluence with Hurricane Creek to Boswell Road	1D HEC-RAS
Meadowlake Subdivision	Meadowlake neighborhood	XPSWMM
Unnamed Tributary to Crooked Creek	Confluence with Crooked Creek to southwest corner of Meadowlake neighborhood	1D HEC-RAS
Owen Creek	Confluence with Fourche Creek to 1,000 ft upstream of Hilldale Road (East-West)	1D HEC-RAS
Owen Creek Tributary and Tributary A	Confluence with Owen Creek to upstream of Roman Heights Ave; Lombard Road	1D HEC-RAS (downstream reach performed in Phase 1)

Appendix A

Resident comments were collected through an online geoform from April 10 to May 22, 2022. The received comments are listed on the following pages.

ID	Name	Email Address	Drainage Issue	Issue Frequency	Phone Number	Contact Address	Preferred Method of Contact	Repetitive Loss or Insurance Claims	Photo Release	Description of Issue	x	y	Nearest Garver Problem Area (if applicable)	Neighborhood/Subdivision	Basin	5yr FSI	10yr FSI	50yr FSI	100yr FSI	5yrV	5yrD	10yrV	10yrD	50yrV	50yrD	100yrV	100yrD
170	Katherein Myres	bananion@gmail.com	Road	Every time it rains	8186249632	3412 Village Green Drive, Bryant, AR 72022	Email	No	Yes	We recently moved to Village Green Drive off Raymar Rd. The tw storm drains in front of the house next to ours and the house across the street from it do not drain, and the street floods there every time it rains, even a little bit. I have attached photos from today and from March 22nd	-92.46820552	34.62567698	18	Meadowlake	Crooked Creek	1	2	2	2	0.4	1.5	0.4	1.6	0.6	1.9	0.7	2.0
171	Kristin Higgins	khiggins@uada.edu	Yard	Every heavy rain	4797996058	406 Sanders Lane Bryant, AR 72022	Email	No	Yes	Water overtops storm ditch on Sanders Lane and flows west into our yard, submerging the southern half of our yard to the back of our property line during most heavy rains. Water has been as high as three inches along our privacy fence. I contacted the city the last time this happened this year. The city's stormwater employee said the culvert pipe under the neighbor's driveway is too small to handle the volume of stormwater. This causes water to dam up ar overtop the ditch.	-92.49537767	34.59106588	N/A	Bryant Meadows	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
172	Pris Sinclair	Sinclairpris@gmail.com	Yard	EveryMulti	501-912-8759	701 Ruth Drive, Bryant	Email	No		There is NO drainage on Ruth Drive so my yard and my neighbor gets flooded every time it rains. The road slopes down to our yard and the rain water floods our yards to the point that we cannot mo until it drys up. My neighbors installed a French drain but it doesn help.	-92.48497081	34.61045254	23	Park Hill	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
173	GAREY B SCOTT	topretired@gmail.com	Road	EveryMulti	8702675348	2124 Cherry Creek Circle, Bryant, AR 72022	Email	No		As I do my walking around Cherry Creek Circle, i've notice several drainage issues where the water seems to be running at all times. Some of this is drainage issues, but i believe the city has several water leaks in the street	-92.47540672	34.61086703	N/A	Cherry Creek neighborhood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
174	Amy Zorn	Amsmall2002@yahoo.com	HouseBusiness	EveryMulti	501-519-2177	2403 Carywood Dr Bryant 72022	Email	No		My property & home is inundated with storm water drainage from Richland Park in the front & from Richland Park & Laverne from the back. My entire property is wet year round. My home has flooded more times than we can count now. The last time, there was knee deep water IN MY HOUSE. There is a permanent ditch cutting across the entire middle of my yard running into the neighbor's yard where it stays blocked...so there's always stagnant water in my yard. The water is toxic & always has an oil sheen even when flowing. The ground is toxic from all the runoff just over the last 20 years that I've lived here. All of my food gardening has to be done in raised beds as to avoid the toxic soil. We constantly fill sinkholes & now there's an 8' deep pit in my yard that's starting to sink the ground around it. The city has already destroyed my curbside lawn. I'll NEVER be able to mow it again because it's full of #2 gravel! They dug this hole 2 weeks ago & haven't been back I have no faith in you.	-92.48905948	34.61624435	37	Carywood/Raintree Acres area	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
175	Thelma P. Poole	thelmapoole@gmail.com	HouseBusiness	Every5	5018375115	1721 Augusta Cove	Email	Yes		I see a lot of infrastructure for storm water drainage put in place in the form of underground pipes. The ditches and holding areas that storm water spills out into are often ignored for long periods of time allowing weeds and trees to grow and prohibit flow thus backing up the water. A prime example is between Augusta Cove and Hwy 5. Also, a few years ago, the ditches behind the Hidden Creek area were not kept cleared and it caused the water to build up in the deep cemented bridges and even knock the railing over. Several houses were flooded.	-92.50846226	34.62062234	5	Forest Cove	Hurricane Creek	2	2	4	4	4.8	2.4	5.2	2.6	6.1	3.0	6.4	3.1
176	Chalsie Sublett	Thesubletts@yahoo.com	Yard	EveryMulti	501-529-2169	807 Allyson Avenue Bryant Ar 72022	Email	No		We were told our neighbors have a city drain in their back yard. our yard is supposed to slope and drain into that... but it floods our side yard and back yard every time it rains. There is a drainage issue here for sure	-92.49565745	34.58764024	N/A	Bryant Meadows	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
177	Paula Power	Paulajpower56@gmail.com	Yard	EveryMulti	903-497-6083	2313 Carywood Bryant AR 72022	Email	No		Storm water comes over curb into yard causing the yard and curb to continue to sink. Storm drain is close but most water doesn't get there because it collects and flows over sunken curb	-92.48930174	34.61599038	37	Carywood/Raintree Acres area	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
178	Linda Zehner	lady.lz@att.net	Yard	EveryMulti			Email			West & South Lea Circle property and street drainage & flooding issues	-92.5098941	34.59332609	13	Near Boone Road	Hurricane Creek	3	3	3	3	0.6	3.7	0.6	4.3	0.7	5.6	0.7	6.2
179	Alindria Jordan	adcarroll1908@gmail.com	HouseBusiness	Every2	501-454-2523	1300 Crossing Loop, Bryant AR 72022	Email	No	Yes	We purchased a new construction home Oct 2016 (1300 Crossing Loop). Approx 6mths later, April 29, 2017, we experienced major flooding in our yard and home. Bryant Fire/Rescue were called to the scene that night. We were displaced for 3 days. We were told this was a 100 year flood and debris clogged the creek. Residents in the older phase mentioned knowing of flooding issues. One went to the City about concerns when they learned houses would be built. April 17, 2019 our home flooded again. We repaired the fence that was knocked down and cleaned the floors again. May 8 backyard flooded/fence repaired a second time. We built a breakaway on one side and an extra opening on the other to release water into the creek. May 29 backyard flooded. On May 18, 2021 backyard and home flooded Each time we estimate at lease 2ft in yard. Water was come above my knee. KTHV measured approx 2-3ft rushing water in the backyard based off waterline on fence in 2021. I've been in contact with CorpEng & City.	-92.48138268	34.64454479	30	Oak Glenn	Owen Creek	0	1	2	2	0.0	0.0	1.7	0.6	2.9	1.5	3.3	1.8
180	Stephanie Guzman	stephbrisa12@gmail.com	Yard	EveryMulti	5014721736	1316 Crossing Loop, Bryant, AR 72022	Phone	No	No	Our neighborhood has unfortunately been the victim of severa flood events within the 2 years of owning this home. The creek tha runs directly through the neighborhood has flooded or nearly flood every time there is more than just a few inches of rain. The houses in the back half of our neighborhood closest to the creek flood severely, while the waters have neared our home up to the garage door.	-92.48078186	34.64481951	30	Oak Glenn	Owen Creek	0	1	2	2	0.0	0.0	1.7	0.8	2.8	1.5	3.1	1.8
181	Felicia Hayes	mizhayes1@yahoo.com	HouseBusiness	EveryMulti	5019525088	1407 Oak Glenn Court Bryant, AR 72022	Email	Yes	No	Flooding almost every time it is heavy rain in Oak Glenn neighborhood. Especially in the crossings area. The mayor, and even local news reporters have been out several times. This hasn damaged our property but it has our neighbors a few times.	-92.4806359	34.64506317	30	Oak Glenn	Owen Creek	0	0	0	1	0.0	0.0	0.0	0.0	1.0	0.8	1.1	1.1
182	Lisa Kennedy	lme1977@hotmail.com	Road	EveryMulti	5735291962	5860 Pierce Manse Loop, Benton 72019	Phone	No	No	There are a few spots on Springhill Road that always collect wate during heavy rains. The road is so busy, it is dangerous to drive into the other lane to avoid the water but it can be dangerous to drive into the water. One spot is on the northbound lane of Springhill between the storage unit complex and the side entrance to Hurricane Lake Estates. Sorry I don't remember the precise location; I drive the road so often it becomes a blur. The second area is the dip on northbound Springhill near the Northlake intersection. That often is so bad that safety cones/signs have to be put out.	-92.51502831	34.63404162	N/A	Springhill Acres	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
183	Jared Butler	Jbutler1975@yahoo.com	HouseBusiness	EveryMulti	5015803483	49 Neal Cove	Phone	No	Yes	These photos were taken on April 12, 2022, one day after a thunderstorm passed through on 4/11/22. The interior pictures ar from our basement, a small amount of water after a night of running fans and de-humidifier. The discoloration of the basement floor is a result of a lot more rain and water intrusion after lengthy amounts of rain. We put in a French drain to alleviate this about 6 years ago, but I suspect is clogged at this point. One of the bigger problems as we see it is the busted up concrete in the middle of th street on Neal Cove and in front of our house, see attached photo of busted concrete on storm drain in front of 49 & 51 Neal Cove. This causes excess water to run beneath our foundation where water can be seen (attached photos) draining under our back patio. I'll be happy to submit additional ones following heavier rain, expected to occur 4/12-4/13	-92.48795066	34.61119719	N/A	Bryant Oaks	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

184	Lisa Mundy	danzrs3@att.net	HouseBusiness	Every5	501-786-4130	4 Arcadia Circle, Bryant, 72022	Email	Yes	No	When the city laid new asphalt on the road, the asphalt now butts up to my driveway. My neighbor noticed they had also blocked the street drain. They came back to cut away from the drain. With the culvert now under asphalt, water runs down my driveway instead of to the drain. The first major event of flooding was May 2017. Water built up at our garage door and was also along the side of the house. Since then, we had a drain put in at the bottom of the driveway that connects to the small concrete runoff my dad built many years ago. Since 2017, we had a major issue in May 2021. A true flash flood that came in from the side of the house where the addition of the downstairs bedroom meets the original footing (water coming in from under a tub). Water also was able to come in under the garage door. We had at least 2 inches of water downstairs. (I can send photos later if needed. I do not have any of the water run-off as it has been at night.)	-92.48364806	34.59945363	35	Bloomfield Hills	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
185	Casey Callahan-Jarvis	caseyscrap@hotmail.com	Yard	EveryMulti	3105254063	1302 pleasant pointe Cir	Email	No		Any time it rains the backyard floods. It takes days to dry up. It's basically a small river in the yard that ends on a giant puddle at one end of the yard. Neighbors are having the same issues with the ones at the back of the road having to open up their backyard gates so theirs houses don't flood.	-92.49724124	34.58339329	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
187	Angela and John Hall	ar_lowery@yahoo.com	HouseBusiness	EveryMulti	5019026615	1809 Pleasant Pointe Crl. Bryant Ar 7202	Phone	No	Yes	, My name is John Hall, I live at 1809 Pleasant Point in the Pleasant Point subdivision in Bryant At. My wife and I moved in our resident Dec of 2015 , since moving in our residence we have experienced extensive drainage issues in our back yard along with several other neighbors. We had a French drain installed hoping to eleveate this issue, but was advised that we needed to contact a city official in hopes that we can come up with a resolution to this problem.Since moving in we have experienced major problems with flooding which has damaged our storage unit, mosquitoes, having to treat one of our dogs for heart worms and with vet bills in the thousand of dollars. I'm contacting you to see if there is anyway we can please receive help on resolving this problem. We look forward to hearing from you. I can be reached any time at 501-902-6615.	-92.4985	34.58152	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
188	Jacob Brady	Jacobbrady027@gmail.com	Yard	EveryMulti	5012139928	705 Bryant Meadows Dr. Bryant, AR 72022	Phone	No		Several inches of standing water in backyard after any amount of rain. Water flowing into streets contains in large puddles at entrance to Bryant Meadows and Martin streets off Griffith.	-92.49424538	34.58868097	N/A	Bryant Meadows	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
189	Lance N Bonvillain	bovie2002@yahoo.com	Yard	EveryMulti	5013267814	1520 Pleasant Pointe Circle	Email	No	Yes	Every year when we get a heavy rain the road and our yard (neighbors yards) floods. You can see an example on this facebook link https://www.facebook.com/karen.bonvillain/videos/10157406170442478 This has occurred multiple time a year over the past 12 years of us living here. There are time that I feel that IF we do not take action to open our privacy fence gate and clear the debris from the chain link fence in the back yard that the water will raise high enough to get into the house. I spoke several years ago with the city engineer. He indicated (and had a crew come out) that the outlet (which is NOT on city land) needed to be cleaned out. The past two years that I have reported this to the current administration the only response that I received was that they could NOT GO ON TO private land to clear the debris from the outlet.	-92.49757627	34.58106618	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
190	Lance N Bonvillain	bovie2002@yahoo.com	Yard	EveryMulti	5013267814	1520 Pleasant Pointe Circle	Email	No	Yes	additional information.....from todays rain... 4-13-2022; I have a video of it but it will not load..	-92.49757627	34.58106618	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
191	Herbert and Shirley Keller	shirley_105@hotmail.com	Road	EveryMulti	501-607-8996	3502 Village Green Drive Bryant, AR 72022	Phone	No	Yes	Water is flowing from Raymar Rd to Village Green Drive through a neighboring property. Our yard as well as both neighbors yard on each side experience water flow and backup water from this issue, the water continues to flow to the street of Village Green Drive where it floods the street as the street drains are not working properly. The flood water then flows over the sidewalk to a pond located approximately 200 feet from the street. The water has caused the concrete of the street to buckle and crack.	-92.4682382	34.62570234	18	Meadowlake	Crooked Creek	1	1	2	2	0.3	1.2	0.4	1.4	0.6	1.7	0.6	1.8
192	Nate Martin	nmartin@wddarchitects.com	Road	EveryMulti	5013766681	1509 Quail Ridge Dr Alexander AR, 72002	Phone	No	Yes	The entrance to the Oak Meadows subdivision is blocked by floodwaters after 3" of rain on 4/13/22. Regular flooding is also destroying the existing culverts at Oak Meadows Rd crossing. Increased stormwater appears to be coming from the recent phases of Magnolia Village Subdivision to the west, and has made this problem worse in the past several months.	-92.48479445	34.64463305	29	Oak Meadows	Owen Creek	1	1	2	2	0.7	0.6	1.0	0.9	1.4	1.6	1.6	1.9
193	Caroline Robertson	Cianna4hym@att.net	Yard	EveryMulti	5018374755	719 Pattywood Dr. Bryant	Email	No	Yes	When we get a fair amount of rain. Mainly my backyard runs like a fast moving creek. It has washed the topsoil up to the foundation on one side of the house while on the other the topsoil has washed out and my foundation is uncovered. Water gets in my garage and I am praying it doesn't start coming through the top of my foundation. I can not put up a new privacy fence because of the water issues.	-92.4864425	34.61679471	36	Carywood/Raintree Acres	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
194	Jan Butram	janteachu@msn.com	Yard	EveryMulti	5014089786	1004 Silktree Dr	Email	No	Yes	Creek/drainage line that runs through the back of our property overflows into our yard with each heavy rai	-92.48295429	34.61594659	36	Carywood/Raintree Acres	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
195	Steven Long	Long.stevene@outlook.com	Yard	EveryMulti	5012496905	3024 Cedar Park St	Email	No	Yes	Stormwater drain ditch on the south side of the property does not properly distribute rainwater, leading to flooding of the entire road, obscuring it from view, as well as serious flooding of the front and backyard. Poses a major threat to homes foundation	-92.51958538	34.6230372	4	Sherwood Park/Sherwood Estates	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
196	Youngbeom Ahn	Youngbeom.ahn@gmail.com	Yard	EveryMulti	9086162135	Youngbeom.ahn@gmail.com Heoma6602@gmail.com	Email	No	Yes	Yard	-92.48153741	34.64488691	30	Oak Glenn	Owen Creek	0	0	0	1	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.7
197	Brandy Nickolson	brandyhelton9@icloud.com	Yard	EveryMulti	(870) 904-2908	2400 east meadowbrook street Bryant ar 72022	Email	No	Yes	The creek that runs beside my house over flows and causes flooding in my yard/driveway/ stree	-92.51449036	34.62445996	5	Sherwood Park/Sherwood Estates	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
198	Joyce Koozer	harp4711@gmail.com	Yard	EveryMulti	469-471-5608	2805 Barbara Court Bryant, Ar. 72022	Email	No		Following the rains of 4-11 through 4-13, large amounts of runoff from the vacant property that borders the backyard of my house came through and left standing water in my yard for days. This is an ongoing problem. I walked the area with a neighbor and there a ditch that appears to drain some of the runoff, but not nearly all of it. This standing water, both in the ditch and my yard, is a haven for mosquitoes at the least. Is there something the city can do that will help this problem?	-92.46060805	34.63959727	39	East Ridge	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
199	Lisa Roberts	Lisafrognurse@yahoo.com	Road	EveryMulti	501-786-8425	6118 Oak Meadows Rd , Alexander, AR	Email	No	Yes	Hilltop Rd between Bryant Parkway and Oak Meadows Rd gets rushing water over the roadway in 2 separate places with heavy rainfall making it dangerous for traffic to cross. Also, our road had a drainage ditch dug, but it still overflows at this area making the road impassible. As noted on 4/13/22.	-92.48234827	34.64253341	31	Hilltop Rd	Owen Creek	0	0	1	1	0.0	0.0	0.0	0.0	0.4	0.6	0.4	0.8
200	Langdon Jones	Buhjonesband@gmail.com	Yard	EveryMulti	903 286 5117		Email	No	Yes	When a big rain comes, my back yard (3508 Village Green) flood all the way up to the back porch. My next door neighbors have a river through their yard. My street and sidewalk are entirely under water every time it rains heavy just one house over. Please come check out!	-92.46816793	34.62569429	18	Meadowlake	Crooked Creek	2	2	2	2	0.4	1.5	0.4	1.7	0.6	1.9	0.7	2.0
201	Tracy kirby	Kirbybills@att.net	Yard	EveryMulti	5012136874	812 hilldale rd Alexander ar72002	Email	No	Yes	Covert running from the roundabout to the creek is overflowin with heavy rainfall's because of the debris inside of it it needs to be cleaned out	-92.4752022	34.64428088	27	Hilldale Road	Owen Creek	0	0	1	2	0.0	0.0	0.0	0.0	2.1	1.2	2.6	1.5
202	Dianne Falls	Fallsd47@sbcglobal.net	Yard	EveryMulti	5015390183	3858 Patriot Cove Benton Ar 72015	Email	No		Flooding in my backyard. Paying someone to fix the flooding will not help. The ditch on Boone road next the Legacy Village need to be deeper for the runoff from the yard	-92.54062379	34.59828448	N/A	Outside City Limits	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
203	Judy Parson	Judyp.tab2@gmail.com	Yard	EveryMulti	501 681-5839	3823 Commonwealth Drive Bryant	Mail	No		The water drains straight into my front yard which faces Commonwealth (3823) and flows into the back so there's barely any real plantable soil back there. It seems to pool in front and I've added a French drain but I don't think it helps much either. The front yard stays constantly mushy & soggy. I'm 75 yrs. old, been here 4 yrs. Every year I try to dig out thatch to help drainage. This year I bought a dethatcher but practically kill myself trying to use it! It's also severe drainage between the houses facing Commonwealth & the houses facing Robinwood. There's is a manhole across Commonwealth at 3820 with no culvert and there is a culvert on Robinwood but apparently none of that relieves the problems. The sidewalks along Robinwood are constantly wet and the runoff from yards look like there's iron in it. I can and will take photos to send. It happens everytime ít rains an appreciable amount.	-92.50092341	34.62993024	N/A	West Pointe	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

204	Lorraine Pope	Lpope0222@gmail.com	Yard	EveryMulti	501-837-8522	1313 Ruth Belle Court Bryant	Phone	No	Yes		-92.50440157	34.60943339	8	Miller Place	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
205	Bart Walker	bartjwalker@yahoo.com	Yard	EveryMulti	5013373998	2802 Barbara Ct Bryant AR	Phone	No		The drainage culver is not large enough to handle all of the water. There is a large empty field that the water runs off as well. It come in and gets out of the banks floods my yard and between two houses it has been more than a knee deep. Plus the neighbor on the opposite side drains across my back yard as well. A church owns the property behind us and they would let the city do something to help us. We should not be forced to leave like this every time it rains. Please help do something so it is not a concer every time it rains. We should have to worry about damage to our property. I have see it very high. There are some things that the city could do to help with this concern and then put it on the maste improvement plan. I have some photos that I could share but they are on my camera and it was dark and didn't show up the best.	-92.46033002	34.63920074	39	East Ridge	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
206	Robyn Davis	Jrobyndavis@gmail.com	Yard	EveryMulti	501-749-7142	905 Woodside Cove	Email	No	Yes	There is almost always water flowing across the cul-de-sac of Woodside Cove. It begins between 904 Woodside Cove and 1004 Woodside Cove then flows across to a drain located between 905 Woodside Cove and 903 Woodside Cove. Also, in the most eastern part of the backyard of 905 Woodside Cove, there is always a lot of standing water after a heavy rain. Heavy rain will cause water to build up in my front yard which sometimes goes in my garage. I don't know how deep the water gets in my garage, b it comes about two feet inside.	-92.50339422	34.61290548	N/A	Edgewood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
207	JESSICA	Jessica.scott61310@gmail.com	Yard	EveryMulti	501-909-4814	1412 Katrina Drive	Email	No		The drainage ditch that runs between the houses and the Valero across from the Jr high. Everytime it rains the ditch overflows and it's like a river running through the backyards of those houses.	-92.49487866	34.58105723	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209	Yesenia Solis	Yeseniasalazar731@gmail.com	Yard	EveryMulti	5016127502	1716 Augusta Cv Bryant AR 72022	Phone	No	Yes	Entrance to the drain needs to be cleaned out. There is a lot yard debris and it prevents the water from flowing out of my yard.	-92.50958276	34.62164666	5	Forest Cove	Hurricane Creek	3	3	3	3	3.4	3.7	3.8	3.9	4.6	4.2	5.0	4.4
210	Erick Martin	eamartin304@gmail.com	Yard	EveryMulti	501-353-5420	1406 Katrina Dr. Bryant, AR, 72022	Email	No	Yes	All the backyards that face the Dollar general and Valero ga station flood whenever there is rain, due to when the sewer was installed in the easement behind the business and our homes, the ditch was dug up and was not properly created again, it's one huge flat surface so the water that is supposed to be in the drain connects with out yard and creates a huge river in all of our backyards.	-92.49584503	34.58253888	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
211	Sherry Williamson	sherrywilliamson.106@comcast.net	Yard	EveryMulti	(501) 831-3896	106 Cedar Drive Bryant, Ar 72022	Email	No	Yes	My backyard stays horribly wet until July every year. We have added trees and a French drain. But it has not helped since flood waters go right through our yard	-92.49676934	34.62829155	17	West Pointe	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
212	Jack Pritchett	jpritch2@sbcglobal.net	Yard	EveryMulti	5012312338	208 N. Hazel St.	Email	No	No	Our neighbor hood has no gutters on the streets. When it rains m property becomes basically a lake. Same for many of my neighbors. Some of the culverts are completely clogged. Some were skipped last time they cleaned them out about a year ago.	-92.48654325	34.59655748	N/A	Original Town	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
213	CHRISTY M SIMONS	irisofmyeye@yahoo.com	Yard		5019123518	2223 Defoe Cir Bryant, AR 72022	Phone	No		My backyard floods when it rains hard. There is a drain in m neighbor to the South's back yard, but it is not sufficient to accommodate the amount of rain that falls	-92.4719413	34.61437896	22	Cambridge Place	Crooked Creek	1	1	0	0	2.0	0.5	2.2	0.6	0.0	0.0	0.0	0.0
214	Howard Tucker	tuckertsr@yahoo.com	Road	EveryMulti	501-940-4365	2412 Raintree Dr., Bryant, AR 72022	Phone	No	Yes	Water constantly stands at the end of our driveway and does not ever drain. We have a pool of water with leaves and debris constantly. We have trouble checking our mail because of the water always in front of our mailbox. During winter months, snow and ice become a hazard when freezing. We have contacted the city to help us with this, to no avail.	-92.48408308	34.61695916	36	Carywood/Raintree Acres	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
215	Robert Shaw	reneeshaw@earthlink.net	Yard	EveryMulti	5019200876	4206 Pine Drive Bryant. AR. 72019	Email	No		2 big culverts drain into our property combine in our backyard can get to 10 to 15 ft wide then flows into courtyard cottages and flood them. We have been here for over 30 years and the years of flooding has eroded our property.	-92.50269014	34.63296464	16	Stoneybrook/Springhill Acres	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
216	Bob McKeon	salinecoww@sbcglobal.net	Road	EveryMulti	15019444528	15250 Hwy111, P.O. Box 390	Email	No		Anytime it rains water from Bryant flows into Crooked Creek an FLOODS out Brookwood Road and our Sewer plant. The BIG ditch that flows across Shobe Road from Bryant's Housing Developments under the Railroad Tracks backs up Crooked Creek. 4 to 6 ft. DEEP	-92.4663666	34.61348737	N/A	WWTP - Outside City Limits	Crooked Creek	0	1	2	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
217	Lloyd Kassler	lloyd.kassler@dillards.com	Yard	EveryMulti	501-580-2217	804 Shobe Rd, Bryant, AR 72022	Phone	No		The ditch between my home and 808 Shobe Rd was repaired/filled with a concrete pipe approx early 2000s to keep my house from falling into the open ditch at that time. During the last big storm a few years ago that caused all of the flood issues, it washed out where the pipe opens to a ditch and has left a huge hole/open pit. When there is a big rain, the water washes over the ground, as we as through the pipe. It has washed away all of the topsoil through this area over time. The road also floods briefly during the runoff. There appears to be a sewer pipe across the ditch in this area, and that creates obstruction to the flow also.	-92.48530675	34.6136196	36	Carywood/Raintree Acres	Crooked Creek	2	2	2	2	3.6	1.7	3.8	2.0	4.5	2.6	4.8	2.8
218	Andrea Clark	andrea@andreasschoolofdance.net	HouseBusiness	EveryMulti	5012311383	211 NE 2nd St Bryant, AR 72022	Email	No		For the past 15 years our building has flooded at least 3x per year. Pretty much every time there is a Flash Flood warning issued. Our road level is higher than our gravel parking lot so water from the road flows directly around our building. We also have water comir from the roof with nowhere to go. We've had to install new gutter systems on the building as well as a sump pump to pump water further down the lot. We've also just had $10,000 worth of termite damage to fix, in part because there is just so much water in their swarming season. When we flood it has risen to a max of an inch or so. Sometimes making it throughout the whole slab portion of the building to the crawl space. We have spent countless hours and even had to close our business for the day to shop vac all the water up. And our clients have to walk through standing water to get to our door, sometimes up to 3 or 4 inches.	-92.48692622	34.59606362	N/A	Original Town	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
219	Debbie Fannon	Fannondebb@yahoo.com	Yard	EveryMulti	501-366-3111	1723 Kensington Dr Bryant At 72022	Phone	No		Serious erosion problem due to no culvert installed on my end (the street. All storm water drains into my hard. Paid thousands of dollars to fix problem. Still has flooding	-92.51006966	34.62763746	6	Forest Cove	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
220	Nan Ring	Nanettering@gmail.com	Yard	EveryMulti	5018403987	1415 Katrina Dr, Bryant	Phone	No	Yes	The back yard floods within 1/4' of getting in our shed. It takes WEEKS to dry out to be usable and then muck boots are required.	-92.49677253	34.58205059	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
221	John williams	jp4williams@gmail.com	Yard	EveryMulti	5014828836	1300 Katrina dr	Email	No		Most of the houses on the east side of Katrina get flooded back yards when it rains a lot from the run off of the property behind the privacy fences. I think that land belongs to the school. If a small ditch was cut 15 foot from the property line all that water would drain south to the detention area behind dollar general and big red instead of washing through the yards . It gets pretty bad when there is a big rain. Thank you	-92.49606643	34.58335553	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
222	Zetha Bone	z.bone@yahoo.com	Road	EveryMulti	5015190810	3405 Stillman Loop Bryant	Email	No	Yes	The street in front of my house retains water after rains- near the corner of Stillman and Vickie Dr	-92.51484064	34.62506654	5	Springhill Manor	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
223	jeffrey neel	neelworld2001@yahoo.com	Yard	EveryMulti	501-416-5172	1403 Katrina dr Bryant, AR 72022	Email	No	Yes	Back yard standing water over 1 foot	-92.496	34.5823	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	1	1	0.0	0.0	0.0	0.0	1.0	0.5	1.1	0.6
224	Shannon Sims	Smsims76@yahoo.com	Yard	EveryMulti	5015173371	2719 Johnswood Village Bryant Arkansas It floods behind all houses on this row behind fence into the yards. The yard stays wet almost all year unless it hasn't rained in a while. See below	Email	No	Yes	Behind my home is a area that needs attention, they need some type of a large pipe for the water to drain into and take the water to the retaining pond behind the mailboxes. The water does not drain correctly and Landers builder was supposed to address it years ago. When we have lots of rain you can see water sitting on top of the ground all the way to the tree in the yard behind me. My yard will stay wet almost halfway up my backyard causing a huge muddy mess for my dog. Please look into putting drainage pipes all the way behind the subdivision this has been a major complaint for everyone in this subdivision for as long as I have been here. I have taken photos in the past I will have to find them on a hard drive if you actually need them let me know I will look for them.	-92.469185	34.61425876	22	Johnswood Village	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
225	Matt cochran	Jm_cochran@yahoo.com	Yard	EveryMulti	5019401371	2620 johnswood village drive	Email	No	Yes	The houses in back of subdivision yards flood when it rains and so do the street	-92.46900119	34.61475908	22	Johnswood Village	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
226	Roger Poole	rogerover3dot@gmail.com	HouseBusiness	EveryMulti	5018375116	1721 Augusta Cove Bryant, AR 72022	Email	No		Drainage ditch that runs across Augusta Cove has had an upgrad recently but the down stream ditch that it feeds into is choked with thick vegetation including what some would call small trees. It needs a clean up	-92.50796873	34.62116988	6	Forest Cove	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
227	Rosie Norman	Rosienorman@hotmail.com	HouseBusiness	EveryMulti	661-221-3978	3201 Independence Circle Bryant AR. 72022	Phone	No	No	Every time it rains a corner of our backyard floods	-92.48588949	34.62704709	6	West Pointe	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

228	Brooks Channell	Brooks.channell@yahoo.com	Yard	EveryMulti	5012135191	3413 LaCross Drive Bryant, AR 72022	Phone	No	No	This entire neighborhood is suffering from extreme standing water and saturated lots after rain. I know that my house has standing water that pools against my foundation and is slowly eroding the land. I have talked to many of the residents on my street and also with the family who owns the large plot of land behind us and they all agree that the city needs to do something about the water issue or this neighborhood is going to go downhill structurally fast. There needs to be a drainage system that runs down from Raymar road, all the way down to the back of the neighborhood running behind our fence line to drain this water and it should be put as a high priority project. I urge someone involved with this project to visit my house after a rain and see the amount of water that these areas hold. Please contact me for more information. Email me with an email address I can send pictures to. I will start getting them.	-92.46421956	34.62490475	19	Meadowlake	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
229	Donna Rice	donna.rice1937@sbcglobal.net	Other	EveryMulti	501-580-3957	518 Lora Dr Bryant, AR	Phone	No	Yes	Almost all of the culver's ohn my side of the street, even number houses, are blocked and the ditch isn't deep enough for the rain run off, with power poles, (one is leaning), and water meters in the ditch it can't be dug deeper, this causes yards, carports, my garag and the street in front of the old Fire Station to flood. Answered "other" in below question didn't give all the above option. I haven't made an insurance claim, paid out of pocket for repairs, do not know if neighbors have filed claims. Have sent pictures to Street Department.	-92.49336989	34.62074005	N/A	Pikewood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
230	Jeffrey Hartsell	jhart2399@gmail.com	Yard	EveryMulti	5014252137	3820 Robinwood Circle Bryant, AR 72022	Phone	No	Yes	The end of the storm drains in our neighborhood terminate in our backyard. The storm drain has began to erode the ground in my backyard. In periods of heavy rain my entire backyard floods out to 30-40 feet. Also in periods of heavy rain, the storm drain system does not carry the entire load and overflows through my driveway and my fence gate between mine and my neighbors house. This has caused several thousand dollars worth of damage from a storm on April 30, 2017. I am attending a video from a storm on May 18, 2021.	-92.49789167	34.62974188	17	West Pointe	Crooked Creek	1	1	2	2	2.4	1.3	2.6	1.5	3.4	1.8	3.6	1.9
231	Kenneth Bunn	kbunn1950@yahoo.com	Yard	Every	15019437098	1813 Pine Circle	Email	No	Yes	Watershed (I think) located at I30 Frontage and N. Prickett Rd overflows and is constantly flooding back yards that back to the watershed	-92.50819404	34.61620312	7	Hidden Creek	Hurricane Creek	2	3	3	3	1.1	2.3	1.1	3.1	0.8	4.3	0.8	4.6
232	Katherine Roberts	Krob467@yahoo.com	Yard	EveryMulti	5014137791	2301 Chelsea dr Bryant, AR 72022	Phone	Yes	Yes	During a regular rain water accumulates in back and front yard causing mosquito problem and yard stays wet and soft almost all year long. Water has come into the house on several occasions:	-92.48727843	34.6153653	37	Carywood/Raintree Acres area	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
233	Erick Martin	eamartin304@gmail.com	Yard	EveryMulti	5013535420	1406 Katrina Dr. Bryant, AR, 72022	Email	No	Yes	When the sewer was installed for the new dollar general an Valero, the ditch in the easement was never fixed so there is a ton of standing water that it's black and creating a mosquito breeding ground.	-92.49585379	34.58266941	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
234	Brenda Gregory	Jbgreg@aol.com	Yard		501 847 1513	1312 Ruth Belle Ct Bryant,AR 72022	Email	No	Yes	Backyard has a huge hole due to run-off from streets behind me also yard fills with water and dead grass from streets behind me	-92.4759968	34.59421926	N/A	Miller Place	Hurricane Creek	1	1	1	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
235	Traci Baker	Supermom2two14@yahoo.com	Yard	EveryMulti	5015807441	1001 Edgewood Dr Bryant, AR 72022	Email	No	Yes	Whenever it rains my side yard floods which moves into my garage.	-92.50400477	34.61346914	N/A	Edgewood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
236	Ronnie E Kettles	r.kettles@yahoo.com	Yard	EveryMulti	501-680-4288	2754 Mountain View Road Benton, AR 72019	Email	No		Drainage ditch between house and street overflows every time it rains. Ditch has standing water most of the time	-92.49089488	34.61577178	37	Carywood/Raintree Acres area	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
237	Jay Sweningson	Speedwagonj@yahoo.com	HouseBusiness	Every	5016265111	300 Crossing Court Bryant, AR 72022	Email	Yes	Yes	It is a well known issue. The creek in The Crossings at Oak Hill (within the Oak Glenn subdivision area) has flooded 2-3 homes in out neighborhood since the community was built. The creek needs to be cleaned out and restructured. The first big storm we had, a adjoining property had cut trees, but didn't remove them, they washed into one of our bridges and dammed it up. Resulting in massive erosion and washing away of protective rocks and such. Since then we have had beavers dam further down creek on another person's property as well. And growth needs to be removed as well so flow can be smooth.	-92.48138184	34.64461806	30	Oak Glenn	Owen Creek	3	3	3	3	4.0	4.6	4.6	5.1	5.4	5.9	5.6	6.2
238	Carol Alkire	calkire2@sbcglobal.net	Road	Every10	501-847-3434	1014 Cedar Dr. (Springhill Acres)	Email	No	No	The creek can overflow onto the roadway during heavy rain events.	-92.50630502	34.62959256	6	Springhill Acres	Hurricane Creek	2	2	3	3	3.2	2.4	3.5	2.7	4.1	3.2	4.4	3.4
239	DANIEL DELLORTO	dangaild@att.net			501-352-8200	301 DOGWOOD PLACE DR	Email		Yes	This is an erosion issue from the storm drain/ditch between 301 and 305 Dogwood Place Dr. We have live here for 20 years and the ditch has eroded several feet on both sides. A sewage manho separated due to erosion in Oct. 2013 (see pictures) and was taken out. There is also a lift station at the back of the lots. Rocks and some concrete has been put down but the ditch sides are still slowing eroding. We were told when we moved in 20 years ago that the city plan was to put in a large culvert pipe from the street the lift station and cover it level with dirt and grass. This erosion w eventually encroach the fences on both sides of the ditch.	-92.48745788	34.60581511	38	Dogwood Place	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
240	Casey McCarthy	caseymc2011@gmail.com	Yard	EveryMulti	5015907880	2807 Johnawood Village Drive	Email	No		The South side of our neighborhood floods horribly when it rains and remains wet for days afterwards. There is a shallow creek bed behind our fence that does nothing to help move the water. I've seen the water stand there for many days so it doesn't even get soaked up by the ground. My backyard is mostly unusable for many months during the year.	-92.46867848	34.61425491	22	Johnswood Village	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
241	Mary Beth Brewer	beth.brewer@sbcglobal.net	HouseBusiness	EveryMulti	2143540657	17 Eastwood Dr	Email	Yes		Development of new housing on off Mills Park Road increased runoff during mid to heavy rains; resulting in flooding on Eastwood Dr, specifically in front of 16 Eastwood. Bryant widened the drainage ditch between Mills Park Rd and Eastwood Dr.; however they did not install drain all the way to the creek behind subdivisio, nor did they replace/enlarge the drain going under the street in front of 16 Eastwood Dr. Because there is so much water coming into the ditch now that the underground drain cannot handle the volume and overfows into the street and into the house at 16 Eastwood. This house has flooded several times over the past few years due to this issue.	-92.47991568	34.6091181	23	Eastwood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
242	William Brent Jones	wbjones1@gmail.com	Yard	EveryMulti	5014254290	212 Dogwood Place Dr	Email	No	Yes	I've lived at this address since 2006 and the backyard on my sid of the street all the way down to the bottom of the hill is a lake when we have heavy rain. It pools up at each privacy fence. I am attaching a photo from April 13 and still have some standing water today the 24th.	-92.48841636	34.60541426	38	Dogwood Place	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
243	Courtney Johnson	Crjohnson@uams.edu	Yard	EveryMulti	501-909-3225	305 Dogwood Place Dr	Phone	No	Yes	Ever time there is heavy rainfall or extended days of rainfall the ci owned ditch floods our yard	-92.48725764	34.60582431	38	Dogwood Place	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
244	Steven Wise	steven.wise@lrsd.org	Other	EveryMulti	5013501410	104 RICH ST	Email	No	No	Storm water in this part of Bryant drains to the railroad tracks and that is where it stays. These areas near the railroad do not drain and produce millions of mosquitoes during the summer months. The railroad property is not maintained at all by anyone. The last time the area was cleared and dredged was over 40 years ago. The railroad has been uncooperative in keeping the area maintained. Previous mayors have also been unable to address the issues blaming the railroad instead. Surely the city and our attorney can get the railroad to comply with this maintenance issue.	-92.49470789	34.59499205	11	Railroad	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
245	Olga Williams	olga@markpettersen.com	Yard	EveryMulti	501-847-4857	718 Elkhart Loop Bryant, AR 72022-3956	Email	No	Yes	Small river flows through this section of the Bryant Meadows neighborhood during heavy rains, most recently was 2022-04-13. Flooding of one or more homes over the years has occurred here.	-92.49685953	34.58535288	N/A	Bryant Meadows	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
246	Rosalyn Poole	rosalyn0430@gmail.com	Yard	EveryMulti	501-428-8778	19 Arcadia Circle Bryant AR 72022	Email	No	Yes	Along our property line in the backyard there is standing water yea round. It is worse when it rains. It keeps the neighboring yard wet and boggy. It is wet enough to constantly rot our fence boards. A tree with rotten roots fell into our backyard destroying the fence in 2019 When it is warm, the mosquitoes are awfu	-92.48606481	34.60042383	35	Bloomfield Hills	Crooked Creek	1	1	1	2	0.8	0.9	0.8	1.0	0.8	1.5	0.8	1.7
247	Charisma Keith	charismakeith@icloud.com	Yard	EveryMulti	5012135112	505 Martin Ln Bryant, AR 72022	Email	No		I live in Bryant Meadows. Every time it rains our street (Martin) floods where there is a drainage ditch. My backyard and front yard flood every time it rains to the point that you cannot walk on it for days after the rain and is almost always soft/wet when it doesn't rain. In the street the water can be several inches deep. My water meter stays under water most of the time. I have contacted the city and they will not fix the issue. I know my yard is not the only one flooding. I see neighbors that have standing water in their front yards every time it rains. I can only imagine the back is the same.	-92.49302548	34.59033279	N/A	Bryant Meadows	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

248	Courtney Johnson	courtney3980@gmail.com	Yard	EveryMulti	5019093225	305 Dogwood Place Dr.	Phone	No	Yes	1. The run-off is full of weeds, some growing as tall as our house. think this is a safety concern because it very well could be bedding snakes. 2. This run-off is causing land erosion to my property	-92.48725764	34.60582431	38	Dogwood Place	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
249	Gunner Miller	gunnermiller9@gmail.com	Yard	EveryMulti	4798835836	3309 Longmeadow Drive Bryant, AR, 72022	Email	No	Yes	I have nearly continual standing water in my yard except for in th hottest of summer months. The sub division was barely built up when it was constructed and is at a lower elevation then the road leading in. Anytime it rains, all runoff flows from the top of the road through all of the streets and yards in the neighborhood. Everyone has the same issue	-92.46345245	34.62364448	19	Meadowlake	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
250	Branon Fryar	fryarfamily@yahoo.com	HouseBusiness	EveryMulti	5016900368	4 Huntington Estates Bryant AR 72022	Phone	Yes	Yes	Drainage issue I would like to submit is for Crooked Creek flash flooding. I live at 4 Huntington Estates and the creek flash floods very rapidly and becomes dangerous multiple times a year. Water can be seen several feet high into Parkview cul de sac as well into my property bordering both sides of Crooked creek. Plans for Bryant Parkway and a walking trail are to cross crooked creek in the area I am reporting. This is a major public safety issue with all the planned development. I know houses on Eastwood flood during major rain events due to tributary drainage issues into crooked creek.	-92.47706759	34.6087106	23	Eastwood	Crooked Creek	3	3	3	3	3.3	4.5	3.5	4.9	3.9	6.0	4.1	6.5
251	Kelly McLarty	kellymclarty@ymail.com	Yard	EveryMulti	501-425-7081	1609 Davis Dr. Bryant, AR 72022	Email	No	No	The drainage creek behind my house continues to plug up. This is the drainage section from Andrew Dr. to Forest Dr. The backyard of 3017 Forest Dr. gets flooded during hard rains.	-92.50777561	34.62299747	6	Forest Cove	Hurricane Creek	1	1	1	1	2.6	0.8	2.8	0.9	3.2	1.1	3.4	1.2
252	Sandra Powell	sandi_1212@sbcglobal.net	Yard	EveryMulti	5015531011	3349 Garden Club Drive Bryant, AR 72023	Phone	No	Yes	When raining a flow of water travels down my back yard with about 3" of water in yard	-92.47718435	34.62585073	N/A	Andres Place	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
253	carolann boone	kjboone1@gmail.com	Road	EveryMulti	5016802335	24 tanglewood	Email	No		with the extended building of the school there is an ever increasing amount of water run off when there is a heavy rainfall- there is now standing water on the road in front of 24 tanglewood- it is suspected that future development (denouement of vegetation , th addition of concrete and leveling of ground) will exacerbate the problem. thanks kathy boone	-92.49522539	34.59787885	11	Tanglewood Acres	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
254	Jessica Ross		Yard	EveryMulti	4799700174	3009 Andrew Dr. Bryant, AR 72022	Email	No		The back yards in my neighborhood (Forest Cove) flood horribly. river literally runs through the middle of my yard and just stays wet. Same with the side yard of my house. Having bought my house at the end of winter, the flooding issue wasn't evident until spring. It's so frustrating when it comes to mowing and just walking around in my yard not to mention the mosquito problem it creates.	-92.50935779	34.62293596	5	Forest Cove	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
255	Joanne Griggs	jwgriggs56@gmail.com	Yard	EveryMulti	5015293009 or 501 672-9714 (Terry Griggs)	814 - 811 Lindy Cove	Email	No		The cul de sac has no storm drain. It ponds up on east side (se addresses above). The water runs through the back yard like a river.	-92.49299128	34.58706069	N/A	Bryant Meadows	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
256	William Pennington	Cliffandjessp@yahoo.com	Yard	EveryMulti	8708185719	2312 Richland Prak Dr	Email	No	Yes	I li e on the west side of Richland Park and several home including mine have spots in our back yards that retain water. The do not drain properly at all. It stays so wet that you can't cut the grass... not even get close with a weedeater without si king into the ground	-92.4902894	34.61792588	37	Carywood/Raintree Acres	Crooked Creek	0	0	1	1	0.0	0.0	0.0	0.0	1.8	0.6	2.0	0.7
257	Kristan Hendricks	krhendricks4546@gmail.com	Yard	EveryMulti	5015078318	13 Parkview Dr Bryant,AR 72022	Email	Yes	Yes	2017-in garage about 1.5 ft of water Yard has flooding multiple times every yea	-92.47901492	34.60878378	23	Eastwood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
258	Doris Sloan	dorisloanj@gmail.com			5015168152	300 Dogwood Place Drive, Bryant.	Email	No		At this address more than 20 years and have had on-going issue with sinkholes at the drain at the SE corner of our back yard. There is one forming now, about 3' x 3' across	-92.48780657	34.60534511	38	Dogwood Place	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
259	Marshall Peters	marshall@mpire.biz	Other	EveryMulti	5014148340	Marshall Peters & Associates 2020 W 3rd St, Suite 201 Little Rock, AR 72205-4463	Email	No	Yes	Water comes from north of the interstate, under I-30 and the access roads and is flooding the back of World Wide Weapons and the parking lot of Bryant Plaza. With each moderately heavy rain, this is causing exponentially more erosion of the land on both sides of the ditch. In the fifteen years of my association with these properties, water has never once stopped flowing!	-92.49474866	34.62023874	N/A	Interstate service road	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
260	Tim and Lesa Vandiver	tlvandiver1983@gmail.com			501.554.1511	3816 Logan Ridge Dr. Bryant AR 702222	Email			No damage. I just understood from the card in the mail that this was where poor drainage issues could be discussed to improve drainage: There is a retention pond at the end of the street (Logan Ridge Dr.) next to Hwy 5. We were told that this was a retention pond to hold water to slow drainage before emptying into the ditch alongside Hwy 5. It is nothing but a frog and snake reservoir. During the new construction of Hwy 5 could this pond be eliminated? Simply connecting the intake from the street drainage to the exit spillway with a large pipe and then filling in the pond and covering the pipe with dirt would solve the problem. Then the homeowners could just mow that area instead of dealing with the hazard. Come look at it. thanks. Tim	-92.48946552	34.62990826	N/A	Hunter Crossing	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
261	Jeannie Telford	Telfordjeannie@gmail.com	Road	EveryMulti	501-773-9178	812 Providence Drive Bryant 72022	Phone	No	Yes		-92.50393612	34.62767942	6	West Pointe	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
262	Jason Baertlein	Jasonbaer79@gmail.com	Yard	EveryMulti	414-379-0655	1300 Johnswood rd Bryant AR 72022	Phone	No		Would be great to have better drainage on mills park rd and shob rd, being how much tax revenue will be coming from the new development of Bryant Parkway and the future expansion it would be great to get a jump start to keep this area expanding and generating more revenue for the city	-92.48080995	34.61326006	N/A	Mills Park/Shobe Road	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
263	Peggy Wilson	pegofmyheart99@gmail.com	Yard	EveryMulti	501-231-2206	210 SE Second Street Bryant AR 72022	Email	No		Whenever it rains a few inches the ditches in front of my house and across the street from my house stay full of water for weeks. When it rains a lot the ditch across the road from my house will flood and cover the road and flood my front yard. The flood water does not reach the house, but has come close a couple of times. The city has dug out the ditches, but that has not seemed to help the problem	-92.4871563	34.59318553	N/A	Original Town	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
264	Gail Cliff	gmcliff52@aol.com	Yard	EveryMulti	15015800061	802 Boone Road Bryant	Phone	No	No	Ditch stays full of water since the City dug around in it several years ago. the water level is below the culvert to drain. The city w not keep it mowed and it is too boggy for us to mow. This had been going on and complaints have been made since Dabbs was mayor. We have lived here 46 years and have always been able to keep it clean. Please again it needs to be looked at.	-92.49833634	34.59542797	11	Boone Road	Hurricane Creek	0	0	0	1	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.5
265	Ashley Copple	Ancopple@gmail.com	Yard	EveryMulti	5012099795	1804 Briarwood Cove Bryant, AR 72022	Email	No	Yes	Back and front yard floods up to 3-4 inches when it rains. Never in garage or home. The backyard sees more flooding and it seems flow like a very small creek from 1802 to 1806 which has caused damage to my wooden privacy fence.	-92.50327537	34.61153993	N/A	Edgewood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
266	Johnny Bragg	Jbragg4@aol.com	Road	EveryMulti	501-690-0175	1 Parkview Dr Bryant, AR. 72022	Email	No		Parkview Dr connects with Mills Park Rd. The southeast corner at this connection holds water. The original street was concrete and it had a "drainage channel" there to allow all the water coming down the hill on Mills Park Rd to continue down to the creek. Several years ago the city paved Parkview Dr with asphalt and covered the draining channel. Then last year Mills Park Rd was redone with a new layer of asphalt and it is even worse. There is no way for all the water to drain. A depressed area if you will, or area lower that the asphalt road exists and remains filled with water long after rain has gone, days. Even in winter it remains a thin sheet of ice there Over the years I have talked to so many different people with the city about it, even shown some of them in person. All said they would get that remedied, that it was bad. To this date nothing don The area catches leaves, trash, twigs, cans, and they stay there until I go clean it up. The city never even does that.	-92.48090667	34.6073973	N/A	Eastwood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
267	David Skinner	sharking41@hotmail.com	Yard	EveryMulti	15018471031	2410 Cherry Creek Circle	Email	No	Yes	Cherry Creek Circle sub-division has major drainage issues that's been overlooked ever since it was developed. Water backups in the road, in individual lots, and is a health issue with all the mosquitos it brings to the neighborhood. I live in the corner lot ne to Shobe and Bryant Parkway. Rainwater from every backyard, east of my lot, flows around all sides of my house and has made my yard a total swamp. The rainwater from all the other backyards can't drain to the ditch along Shobe road because of the long brick wall. There needs to be drainage ditches between each lot so the water will run to the road. The entire northside of Cherry Creek Circle has no storm drains, so the water backs-up in numerous yards an in the street. Storm drains are needed to allow proper drainage and prevent so many yards from being saturated with water/swampy/boggy mushy messes. This issue happens every time it rains, but especially bad in the spring and early summer.	-92.47609448	34.61258164	N/A	Cherry Creek neighborhood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

268	Larry Edwards	ldonedwards@gmail.com	Yard		918-853-2266	2405 Cherry Creek Circle	Mail	No	Yes	Rainwater backs up into the south side of my yard creating a swampy area and causes a mosquito problem. The water runs from neighboring backyards and from the road. The area is so swampy it can not be mowed during the spring and early summe This is a problem at least 4 months out of the year.	-92.47581425	34.61228223	N/A	Cherry Creek neighborhood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
269	James Fowler	jamesfowler@hotmail.com	Road	EveryMulti	5019090997	3413 Village Green Drive Bryant, AR 72022	Email	No	Yes	The storm drain on Village Green Dr, that is meant to drain int Meadowlake pond, sits below water line at times and is filled with sand and gravel that has been transported by stormwater. The street & neighboring yards flood ever time it rains. There is a sinkhole forming in street and shoreline erosion continues to worsen. I've already repaired one dangerous hole near the pond after witnessing three different children and two dogs fall in on separate occasions	-92.46807219	34.62562138	18	Meadowlake	Crooked Creek	1	2	2	2	0.4	1.4	0.5	1.5	0.7	1.8	0.7	1.9
270	Bill james	Bill.d.james@gmail.com	Yard	EveryMulti	5012090286	2115 Hickory Drive	Email	No	Yes	Flooding in back yard and side do to water drainage issue.	-92.51285815	34.63855011	N/A	Hickory Hill	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
271	Greg Bowman	Budlers@att.net	Yard	EveryMulti	5015170486	3309 Henson Pl.	Email	No	Yes	A contractor re-poured the curbs in front of my house. These curb are higher than the ones that were replaced. I was talking to the contractor and he told me that the necessary dirt work would be done to bring my yard back up to curb level and re-sod the fresh dirt. Also, on the south side of my house, I get all of the back neighbors water. There was a hole in the original curb to drain this water. I asked for a hole for drainage and he said he would try to something. This water backup, floods my water meter box and keeps this area very muddy. This curb actually serves as a dam to hold the water back. It appears that all of the utility work has been done, and I have been looking for the contractor to come back. This has been quite awhile and I'm sure it has slipped his mind. During all of the utility work, my electric service has been interrupted several times. Since the last time, my lights flicker. I have been unsuccessful get them out to look at it.	-92.51105671	34.62485366	6	Springhill Manor	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
272	Brent Coney	brentconey@gmail.com	Yard	EveryMulti	5016905877	2616 Finley Loop Bryant, AR 72022	Phone	No	Yes	Between my house and my neighbors house has pooling water that was originally supposed to drain behind our houses into the culvert, however now the water is flowing to the front of my house that is at the very "bottom" of the hill and the drain is more up the hill so the water never gets to drain. When we get a really bad rain there will be 6 inches to a foot of ra standing still between mine and my neighbors house. If we could get water to drain out the back of the property like it originally did, I think the issue would be resolved.	-92.50952199	34.65540387	2	Springhill Village	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
273	Carolyn Geffken	c.geffken@sbcglobal.net	Road	Every	(501) 749-5234	3003 Chapman Ct	Email	No	Yes	During flash floods of 3-4 inches , the sewer drains in front of my house can not drain. It is at a base of hills. Water at top of Finley Loop near Chapman Ct also covers the road. Excess water circles my house, draining down my side into the back yard to exit to Roset Ln, on the way to the drainage into the creek. This occurred in Spring 2018, twice 2019, April 4, 2020, May 19, 2021. In 2019, stood in the back yard to have water up to my hips. I put in retaining walls, nativerain garden, French drains. The water marks can be seen on front mailboxes, along fence, and debris on driveways. I noticed Chapman Ct road pavement is cracking more each year. It fills with grasses which I try to pull out. During these flooding events, the road becomes a bowl of water, goes up driveways(mine and neighbor across street) but never entered the house, but close to. Excess water escapes to my back yard. When it recedes, it does so quickly. Depth of water… in back fence it has been between 1-2 feet.	-92.508647	34.65465761	2	Springhill Village	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
274	James Easterling	jameseasterling83@gmail.com	Road	EveryMulti		2306 Cherry Creek Cir	Email	No	Yes	There are no culverts so water goes everywhere instead of th drains.Also this causes the asphalt to constantly be destroyed and never gets fixed,can you please look into this,thank you,some of the yards look like a swam	-92.4759906	34.6119214	N/A	Cherry Creek neighborhood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
276	Mark Mathis	Mwm1904@sbcglobal.net	Yard	EveryMulti	501-350-7227	1409 Katrina Dr Bryant At, 72022	Phone	No	Yes	The back yard floods every time it rains. Always standing water. It is rotting all our fencing	-92.49676942	34.58227556	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
277	Brigham Barefoot	lr_barefoot@yahoo.com	Yard	EveryMulti	5012912850	3204 Independence Circle Bryant, AR 72022	Email	No	Yes	Almost each and every rain, flooding occurs in backyard of 320 Independence Circle due to runoff from shopping center on Hwy and water runoff from Independence Circle between 3204 and 3210. Drainage fills detention pond behind 3204 Independence Circle. During heavy rains, detention pond gets 3-5 feet deep. Culverts are not large enough and Detention pond does not dry out until June thru September and only is dry if there is approximately 7 straight days of sunshine. Detention pond stays saturated from October till May	-92.5029691	34.62410638	6	West Pointe	Hurricane Creek	0	0	1	1	0.0	0.0	0.0	0.0	1.3	0.7	1.3	0.8
278	Jesse	Tahoehenson@yahoo.com	Yard	EveryMulti	Henson	608 shobe road Bryant Arkansas 72022	Email	No	Yes	April 13th 2022 rainfall caused the "drainage ditch" behind our house to flood and rage extremely fast. This "ditch" is somewhere around 10ft deep and is dangerous, causing our home and yard to be pulled towards this now creek. I have a video of before and aft the rainfall as comparison that I will be happy to provide.	-92.48750692	34.61357501	N/A	Carywood/Raintree Acres - on Crooked Creek	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
279	Dan Wright	wright_dan@sbcglobal.net	Yard	EveryMulti	(501) 249-7067	2313 chelsea dr Bryant Arkansas 72022	Phone	No	Yes	I have had standing water in my backyard and on the south side my house. Its been there since the beginning of march. It sometimes covers about half my yard. It's s about 3 to 4 inches deep and runs along my back fence. Grass has never grown there since i bought the home in 2013. My metal storage buildings are on blocks to keep the floors from rotting out. Mosquitoes are terrible!	-92.48790185	34.61577322	37	Carywood/Raintree Acres	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
280	Jean Martin	smartin8234@yahoo.com	Yard	EveryMulti	501 786-7669	608 SE 1st St	Email	No	Yes	I bought my house 6 years ago. My back yard floods every time it rains. It holds at least inch to two inches of water. My neighbor pa for contractor to look at issue. They said french drains with pump. They said drainage the city has implemented behind house that th pipe is out of ground. I have emailed my alderman and he responded with neighborhood is on the list for help. The water has never entered my house but has been very close.	-92.48360986	34.59450983	33	Hidden Forest	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
281	Darby Jackson	jacksondarby@yahoo.com	Yard	EveryMulti	501-766-5516	2808 Carywood Drive Bryant, AR 72022	Phone	No		Our entire Carywood/Raintree Acres Neighborhood. We live very near the Lora/Carywood Drive intersection. There is one house on Lora that is uphill from us. The rainwater rolls off their property down a slope into our yard. Our garage has flooded at least 2x/ye since we moved here in Fall 2012. Usually once in the Spring and once in the Fall. Water of about 1-2 inches seeps in and stands in the garage for 24-48 hours. Our front and back yards both have low spots where the water drains and stands. The water runoff from our upper neighbor is eroding our yard on that side becoming a steep slope. More than ourselves, everyone downhill from us ha major flooding issues which have led to foundation issues and thousands of dollars in repairs from flooding interiors. The current plan does not look to expand a culvert drain down the length of Carywood but should from top of hill at Lora down to bottom. A drainage ditch or culvert needs to be put in for the houses betwee Chelsea and Amber Cove	-92.48797018	34.62032228	36	Carywood/Raintree Acres	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
282	Angela Moore	angelamoore918@gmail.com	Yard	EveryMulti	501-707-4591	1613 S Lea Cir Bryant, AR 72022	Email	No	Yes	Every time it rains hard, our neighborhood floods. The water floods to our side yard and back yard and pushes debris all over our back years fence. 3 years ago with the floods in April, water came up within 3 inches of coming in our house. Also, our next door neighbors used to get lots of sewage in their yard from the cap coming off the sewer cover in the middle of Lea Circle. That problem was fixed with a new cap that is bolted on, but now the past two large rains in April/May I have tried to use my washing machine the day after the rain and it seems the drains are not larg enough to handle the water. Twice when my washer was on the draining water cycle, water starts trying to come out of the pipes connected to my washer. We need a better/bigger pipe and drainage system.	-92.50806731	34.59256883	13	Near Boone Road	Hurricane Creek	2	2	3	3	0.8	2.1	0.9	2.7	0.9	4.2	1.3	4.8
283	Mark Smith	stephaniesmith0725@gmail.com	Road	EveryMulti	5013505220	1909 Pine Circle	Phone	No	Yes	We have had drainage issues for years right by our driveway mail boxes it's so bad we can't even mow our grass in this area & call the water company to look at it but they still never do anything about it & it has oil in it and has odor in	-92.45728	34.60555	7	Hidden Creek	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

284	Amy Zorn	Amsmall2002@yahoo.com	Other	EveryMulti	501-519-2177	2403 Carywood Dr 72022	Email	No		My entire property is inundated with stormwater runoff from Richland Park (Thanks James Ballew & cronies) every time it rains. My home has flooded up to knee deep multiple times. Stormwater covers my entire property & flows through the entire width of my back yard to reach the ONLY ditch between the "retention" pond (SW corner of Richland Park) & the only drain on Carywood. The "ditch" is non-existent or filled in outside of my property leading to stagnant water. Water also jumps the front curb & flows up my driveway towards the house before flowing onto the neighbor's property. My ground is toxic. I'm afraid the runoff is making my dogs sick. To answer the next question....EVERYTHING FLOODS HERE!	-92.48910711	34.61626309	37	Carywood/Raintree Acres area	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
286	Carlton Anderson	anderson.corky@currently.com	Yard	EveryMulti	(501) 840-1276		Email	No	Yes	The ditches that are on the back and the side of my property have not been dug out and needs leveling so the water can run through them. The new drain that was put in are higher then the ditches, with the new directing more water to the ditches.	-92.48377027	34.61595614	36	Carywood/Raintree Acres	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
287	Butch Higginbotham	mtnfork@yahoo.com	Yard	EveryMulti	(501) 350-2088	400 NW 3rd St Bryant, AR 72022	Email	No		Yard and crawl space flooded after virtually every ra Excess runoff from school never addressed Study by Ted Taylor on original city area open ditches and culvert found numerous issues with filled ditches, covered and undersized culverts. NEVER addressed I've had to repair foundation twice last five years because of continued flooding I can provide pictures upon reques	-92.49300536	34.59732095	N/A	Original Town	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
288	Butch Higginbotham	mtnfork@yahoo.com	Yard	EveryMulti	(501) 350-2088	400 NW 3rd St Bryant, AR 72022	Email	No	Yes	Drainage issues at SE 3rd around electric substatio Stir water from area drains there with no storage or detention. Floods numerous back yards on SE 2nd st Ted Taylor and Tim Fournier have both been to area in past 3 years. Nothing done to date to resolve issue	-92.48456705	34.59243537	N/A	Original Town	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
289	Jeremy Withers	Withersjeremy@yahoo.com	Yard	EveryMulti	5016267547	5331 Buckingham Pl Bryant, AR 72022	Email	No	Yes	Poor drainage on Buckingham road in Kings Crossing. Several houses experience flooded yards during rain storms. In extreme cases the roads are flooded and impassable.	-92.46786632	34.64231603	N/A	Kings Crossing	Owen Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
290	Jeremy Withers	Withersjeremy@yahoo.com	Yard	EveryMulti	5016267547	5331 Buckingham Pl Bryant, AR 72022	Email	No	Yes	Poor drainage on Buckingham road in Kings Crossing. Several houses experience flooded yards during rain storms. In extreme cases the roads are flooded and impassable.	-92.46786632	34.64231603	N/A	Kings Crossing	Owen Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
291	Butch Higginbotham	mtnfork@yahoo.com	Other	EveryMulti	(501) 350-2088	406 NW 3rd Bryant, AR. 72022	Email	No	Yes	Flooding from overflowed ditches off NW 4th, storm water from school, and overflowed ditches off N Pine S	-92.49349562	34.597344	N/A	Original Town	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
292	Adria Tacker	atacker6006@gmail.com	Yard	EveryMulti	(501) 681-7771	2306 Amber Cove Bryant AR 72022	Phone	Yes	Yes	2/2018 Front and back yard and stree	-92.48822072	34.61590635	37	Carywood/Raintree Acres area	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
293	Kathryn F Whittamore	kwhittamore@gmail.com	Road	EveryMulti	5018134679	PO Box 1355, Benton, AR 72018		No	No	cul-de-sac on Parkview Drive floods when there is lots of rain	-92.47862747	34.60893169	23	Eastwood	Crooked Creek	2	3	3	3	2.4	2.7	2.6	3.0	2.8	4.0	2.9	4.4
294	DEBBIE BROADWAY	debbiebroadway@sbcglobal.net	Yard	EveryMulti	5017657178		Email	No	No	Flooding in the open ditched in original Bryant from SE 1st-SE 3rd on SWalnut to S Laurel	-92.48900015	34.59330074	11	Original Town	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
295	CJ THOMAS	cj7thomas@yahoo.com	Yard	EveryMulti	501-463-3132	1003 Sunset Gardens East. Bryant Ar. 72022	Phone	No			-92.50423753	34.62306345	6	Sunset Meadows/Gardens	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
296	Travis Gasnier	travis.gasnier@gmail.com	Road	EveryMulti	8705409469	607 Crestwood Cove Bryant, AR 72022	Email	No	Yes	May 5th, 2022 - Latest event but typically floods any time there i heavy rain. The drain along Commonwealth Rd backs up and water completely covers Commonwealth R	-92.5003526	34.62871064	17	West Pointe	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
297	Thomas W. Woodall	thomaswoodallsr@comcast.net	HouseBusiness	EveryMulti	501 772-1194	1613 Rodeo Drive Bryant 72022	Email	Yes	Yes	This time the water did not make it up to my house but 6 or more times in the last 4 years and it continues to be a problem. I understand that when the house was built in 1998, the builder was supposed to raise the house level with the road but it is 2 feet below that and the City let him get away with it for these 3 houses on the end of Rodeo Drive. Storm water drains to our houses and has no good way to drain from here and floods every time 2 inches or more falls. Several surveys have been done of the problem wi little to no effort by the City to fix it. There is a Sewer system in th drain area and I have been told by the COE that if it is declared a flood zone the sewer will have to be moved.	-92.50816781	34.60178293	8	Woodland Park	Hurricane Creek	0	0	1	1	0.0	0.0	0.0	0.0	2.3	0.9	2.8	1.1
298	Joseph Slater	andyslater76@hotmail.com	Yard	Every5	501-804-4187	109 Monticello West Bryant, AR 72022	Email	No	Yes	Concerns regarding runoff from nearby pond. A developer has installed some concrete and stone in the area to allow water to overflow in close proximity from the pond. The water that flows out of the pond goes between the homes on Pinnacle Drive and Abbie Lane in a dirt channel. The water is eroding the soil and there's concern that if anything clogs the waterway, the water will be redirected into the surround homes and back yards. We have seen major flooding in the backyard before and the work done by the contractor has helped but the waterway that flows out of the pond needs to be reinforced with rock or gravel to ensure proper runoff into nearby retaining pond in Monticello West.	-92.49488492	34.63510977	N/A	Midtown	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
299	Tiffany Flowers	tiffany_tipp@yahoo.com	Yard	EveryMulti	501-837-3873	511 Martin Ln Bryant, AR 72022	Email	No	Yes	Flooding of street and yards.	-92.49338556	34.58996548	N/A	Bryant Meadows	Hurricane Creek	1	1	1	2	0.1	1.2	0.1	1.3	0.1	1.5	0.1	1.6
303	Robert Graves	robt.graves1952@gmail.com	Road	EveryMulti	5018477003	3404 village green drive	Email	No		With every light rain, the road at the curve on Village Green D floods. It has gotten worse since the business has gone in at Raymar Road, I 30 South Frontage Road and the new cut through just north of the Bryant Parkway overpass	-92.46815646	34.62569716	18	Meadowlake	Crooked Creek	2	2	2	2	0.4	1.5	0.5	1.7	0.6	2.0	0.7	2.1
304	Laura Cheak	llcheak@att.net	Yard	EveryMulti	501-425-6355	3601 Dearborn Cir Bryant, AR 72022	Email	No	Yes	Our yard floods every time it rains. From February to August, we are unable to use our backyard because of the water running through it. We moved into this house in 1999. We started having problems when the houses were built behind us. At which time we were told by the city that upon completion of that neighborhood they would be putting in junction boxes and tying the storm drains into a lager line that would take excess rain water further away. Then it continued to get worse after the neighbors to our east and west installed french drains. Numerous calls to the city each time being told the budget was tight and they were working on drainage in neighborhoods to the west of us where people were actually getting water in their homes not just standing in their yards for weeks and months. The storm drain by our house just dumps out behind our fence. We were told they had plans to remedy that. Then there was drainage work in the neighborhood behind us and we talked to the the contractor but	-92.49939656	34.62782772	17	West Pointe	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
305	Peter Cunningham (First Southern Baptist Church)	Peter@fsbcbryant.org	Other	Every10	5018473014	604 S Reynolds Rd, Bryant, AR 72022	Email	No	Yes	I will attach a picture. The storm water issue we had most recently was last summer after a HUGE rain / flash flood. There is a run off ditch that enters the church property from Bryant Meadows, the drainage area has a concrete bottom, for quite a distance. The drainage ditch was dug by the city years ago when the neighborhood was built. In this instance, there was so much rain, so fast that the ditch became full and could not handle the water volume from the property. It did not allow the water to leave through normal flow. Thus it backed up into various parts of our building, entering under doors. It cost the church about $1500 in expenses related to renting fans and dehumidifiers and a about 40 hours of volunteer hours.	-92.49235409	34.58946038	N/A	Bryant Meadows	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
306	Nancy S Phillips	newyarkie@gmail.com	Yard	EveryMulti	5013267680	1903 Mayapple Drive, Bryant, AR, USA	Email			The drainage along the western portion of Cherry Creek Circle i not good. Water stands in the gutters, and the yards on both sides of the street stay VERY muddy for days after periods of heavy or extended rain	-92.47615958	34.61174997	N/A	Cherry Creek neighborhood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
307	Mark Rogers	markr@daniellabel.com	Yard	EveryMulti	501-838-0408	1004 Ruth Drive Bryant, AR 72022	Email	No		Every time it rains, the corner of Ruth Drive and Mills Park Roa holds water for days (some times weeks) Even after the drainage ditch recedes from overflowing, the water in the road remains because the area between the drainage ditch and Ruth Drive is higher and there is no curb inlet from the road to allow the water to go anywhere. Now that Mills Park has been repaved and is higher than Ruth Drive, the water now floods my yard much worse than it did before - the sidewalk at the corner stays full of water (and this is the cross walk that everyone is tryin to use daily).	-92.48115737	34.6100931	23	Mills Park Road	Crooked Creek	1	1	2	2	0.7	0.8	1.0	1.1	2.2	1.6	2.5	1.9

308	Connie Elder	connie@taxshelterinc.com	HouseBusiness	EveryMulti	501-944-9700	2407 Raymar Road, Bryant, AR 72022	Email	No	Yes	When developer built subdivisions that surround this property ther was insufficient storm drainage in the plan. This property has bee flooding my inlaws property for years. It crosses property and has no exit point other than the sitting in the back yards of our neighbors living on Lacross Street. We purchased our property in March 2016 and reached out to Ted Taylor, City of Bryant Project Engineer in 2019. He toured property and brought along Vernon Williams of GarNat Engineering. Mr. Williams provided us with a $51,000 estimate of what it would take to property remove the storm water. I'm not sure if we were ever added to the project list.	-92.46484276	34.62360038	19	Meadowlake	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
309	Doris Sloan	dorisloan@gmail.com	Yard	EveryMulti	501 516 8152	300 Dogwood Place, Bryant 72022	Email	No		My backyard has a storm drain in the SE corner. In heavy rain the yard floods and the ground is undermined at the drain, causing sink holes. I have had drainage gravel installed over what was once grass, but was being eroded by the river that ran through it during heavy rains.	-92.48780657	34.60534511	38	Dogwood Place	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
310	Horace. Henderson	henderson7485@yahoo.com	Road	EveryMulti	501 213 5515	1025 Prickett Rd. Bryant At 72022	Phone	No	Yes	Standing water that is a real problem for people walking or jogging in the street. Mosquito breeding another proble	-92.50298419	34.60658762	N/A	Miller Place	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
311	Yesis Reyes	yesis.reyes@gmail.com	Road	EveryMulti	5015293057	1813 Briarwood cove	Email	No	Yes	I've noticed that when it rains I have a pool of water at the end of my drive way. Pretty much our whole cul de sac is like that. I do n have a way of getting rid of it easily since I do not have anywhere to put the water in. I hope this helps get it fixed.	-92.50365843	34.61217536	N/A	Edgewood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
312	Joseph Loghry	Cjloghry@gmail.com	Road	EveryMulti	5016588303	2307 Pleasure Dr Bryant, AR 72019	Email	No	Yes	Water standing in street and ditches for days after rain. Standin water in ditches never dries up. Repair crews made the ditches worse about 2 years ago	-92.51467476	34.63164293	N/A	Crystal Valley	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
313	Angel Murphy	guardianangel042000@yahoo.com	Road	EveryMulti	5012135267	465 Windrush Point Alexander, AR	Email	No	No	The intersection of Rudolph and Hilldale floods. The water cover the road making it impassable. It seems as if the storm drain is full of debris and overgrowth of the woods	-92.48773139	34.6570108	25	Hilldale Road	Owen Creek	0	0	1	1	0.0	0.0	0.0	0.0	3.0	1.1	3.2	1.5
314	Tracy Kirby	tracykirby@att.net	Road	EveryMulti	5012136874	812 Hilldale Rd	Phone	No	No	Covert across from house is not large enough to handle drainag from road and roundabout. Need to replace covert similar to the one going into the neighborhoo	-92.4745397	34.64394768	27	Hilldale Road	Owen Creek	0	0	1	2	0.0	0.0	0.0	0.0	1.7	1.1	1.9	1.6
315	Garey Scott	topretired@gmail.com	Road	EveryMulti	870 267 5348	2021 Cherry Creek Circle Bryant, AR 72022	Email	No		I walk most days about 4 times around the Circle and I see wate flowing into the drains, water in the streets and yards that look to be floodec	-92.47540672	34.61086703	N/A	Cherry Creek neighborhood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
316	Josh Cox	Cox_josh@comcast.net	Yard	EveryMulti	5019439455	2317 Cherry Creek Cir. Bryant AR 72022	Email	No	No	The entire west side of Cherry Creek Cir. First moved to this home in 2005 and there would be standing water in the road that never drained. The city fixed it by grading the roadway to move the water to the west side of the street which resulted I. The East side losing its curbing and all of the water now being moved from the roadway into the yards on the west side of the road. Their yards are constant mud pits and have standing water almost year round. There needs to be drainage installed to route the water to the drainage ditch which runs to the creek. With all the new construction across Shobe the water is going to get worse.	-92.47618959	34.61159771	N/A	Cherry Creek neighborhood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
317	Rebecca Taber	becksoptin@gmail.com	Yard	Every	8706882780	1609 S Lea Cir Bryant AR 72022	Phone	No		As a rule of thumb, every time rain fall causes water to cross over Boone Rd near the little church or over the Bishop Park bridge our yard and parts of Lea Cir flood. When there are heavy rain falls in a short amounts of time our yard and street will flash flood. My property will flood from the back due to the overflow on Boone Rd near the church, which I understand to come from Hurricane. This has caused significant flooding to my barn area and has damaged fencing. We purchased this home in 2007 and were not include in the floodzone requiring flood ins, but that changed for us in 2020.	-92.50772801	34.59268601	13	Near Boone Road	Hurricane Creek	1	1	2	3	0.5	0.7	0.5	1.3	0.7	2.8	0.7	3.4
318	Tiffany Flowers	tiffany_tipp@yahoo.com	Road	EveryMulti	501-837-3873	511 Martin Ln Bryant, AR 72022	Email	No	Yes	Flood water location is on Martin Ln. The water rises up into the yards close to the cars, trucks, and garages	-92.49337751	34.58995886	N/A	Bryant Meadows	Hurricane Creek	1	1	1	1	0.1	1.1	0.1	1.2	0.1	1.4	0.1	1.5
319	Reagan McKinley		HouseBusiness	EveryMulti	870-703-1976	801 SW 3rd St	Phone	No	Yes	Ditches and culverts are not draining. Road, Yard, Garage a flooded previously due to this issue. Every time it rains. Please call 870-703-1976 to discuss.	-92.49811011	34.59251435	N/A	Morden	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
320	The Ferguson's		Yard	EveryMulti	870-703-1976	802 Southwest 3rd St. Bryant, AR 72022	Phone	No	Yes	Please call 870-703-1976 to discuss. Rain does not drain through ditches and culverts. Rain floods yard, road, driveway every time it rains	-92.49814339	34.59295327	N/A	Morden	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
321	Matt Phillips	matt.phillips@carkw.com	Yard	EveryMulti	5015290230	2312 Carywood Dr	Phone	No	Yes	Water stands during winter and after rain through out the year. Th curb has settled which does not allow water to drain down grade from the area	-92.48842499	34.61603916	37	Carywood/Raintree Acres area	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
322	sarah griffiths	stonegriffiths@yahoo.com	Road	EveryMulti	5014257471	1704 Forrest St Alexander AR 72002	Mail			Cannot drive through Hilltop Rd closer to the Hilldale end during heavy rains. Especially in front of 810 Hilltop R	-92.48140413	34.64244514	31	Hilltop Road	Owen Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
323	NATHAN R WILSON	nwilson705@gmail.com	Yard	EveryMulti	5012531959	6510 Springhill Rd	Phone	No	Yes	When Springhill Village Drive was built it caused my property to start flooding. We have pictures of the flooding issue that takes u a great portion of our yard running next to Springhill Village Dr. Water coming down the hill from the north floods the area next to the Springhill Village sign on the corner, then turns down our yard to the east to flow into the open creek which then floods that end our property.	-92.51419068	34.65487511	N/A	Springhill Village	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
324	Janet A Shuttleworth	janken981@yahoo.com	Yard	EveryMulti	501-765-3109	2112 Cherry Creek Circle Bryant, Ar. 72022	Phone	No	Yes	Damaged storm drain that runs from the street through our front, side, and back yard has caused catastrophic erosion in our yard and in turn has damaged our shed in our backyard. I emailed our mayor regarding this issue in June 2021. He contacted Tum Fournier, Public Works Director . We were told in order to work on the drainage piping, we would have to "give temporary construction easement……." and with "current project load, it would be 2-3years before We can get to this project " I still have a copy of the emails and pictures I sent. The yard erosion and damage continues to worsen because of the danged storm drainage system that runs through our yard. Please help us!	-92.47497606	34.61103852	N/A	Cherry Creek neighborhood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
325	Stephen Williams	Willjc74@gmail.com	Yard	EveryMulti	5017222841	2414 Cherry Creek Circle Bryant, Arkansas 72022	Email	No		Every rain we have,brings standing water in our back yard due to runoff from our neighborhood. All the water from our neighborhoo entrance runs through our yard and into my neighbors yard causing very soft areas and mosquitoes. We also have standing water on Shobe Rd close to our property boundaries.	-92.47590398	34.61289705	N/A	Cherry Creek neighborhood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
326	Tim Lenahan	Timothy.Lenahan@me.com	Yard	EveryMulti	501-413-0817	3514 village green drive Bryant, AR 72022	Email	No	Yes	Storm water floods my back yard every time it rains. Water cover half my yard, 2-3 feet deep, and stays for days, which is a health hazard due to mosquitoes	-92.46824128	34.6262475	18	Meadowlake	Crooked Creek	0	0	1	1	0.0	0.0	0.0	0.0	0.3	0.6	0.4	0.6
327	Donald Shauger	Ciachef89@icloud.com	Yard	EveryMulti	862-293-8120	3600 village green drive Bryant Arkansas 72022	Phone	No	Yes	Raymar rd floods the water comes off the road and behind our houses and sits for weeks on end causing mosquitos bugs and snakes , we all have kids and this is very dangerous this is the responsibility of the town to help with it is not on the 5 acres behir our houses that land owner has nothing to do With the flooding the water comes from Raymar road and floods the whole street into th pond but it goes through our yards and makes it unlivable .	-92.46840766	34.62647375	18	Meadowlake	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
330	Carolyn Slater	carolyn_a_slater@hotmail.com	Yard	EveryMulti	8658035610	89 Pinnacle Drive, Bryant AR 72022	Mail	No	Yes	Front yard is standing in water with any hard rain-the rainwater cannot get to the drainage system in the street. I also get all the rainwater draining from other (higher) yards. A virtual river runs from all that rainwater as a small river thru to back yard where it makes its way thru other backyards trying to make its way to the drainage ditch behind my house. When heavy rain occurs, my fence is 3 ft under water adjacent to the said drainage ditch. I have concerns as well about the pond behind the cul de sac in which I live in Stoneybrook SD. The developer seems to be attempting to reroute the overflow to "said drainage ditch". With the issues I am having and the lack of oversight and involvement with agencies who can provide the knowledge and laws to cause the developer do what needs to be done, we may as well be living way out in the county on a farm. But we are living in the CITY OF BRYANT in a very large subdivision. I feel like I have a dark cloud over my head-just waitin	-92.49531357	34.63431628	N/A	Midtown	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

331	Janet bass	Janetbass58@gmail.com	HouseBusiness	Every5	5018605660	1709 hidden creek drive, Bryant AR 72022	Email	Yes	Yes	The water from hidden Creek can flood over the bridge and onto the front of my property. This last year it flooded my house. I had my house in a upheaval state for approximately four months. When I bought the house I was told that it had flooded a couple of times before, but that the issues were not something that would be repeated (for example, once they said it had some kind of construction cause). Apparently that was not true. Also, The drainage culvert ends behind my property and there are trees and growth that seem to block it which may contribute to it not flowing nicely. I don’t have photos of the flood, but I have photos of the drainage that has growth in it or where the concrete stops. Last year when it flooded, I believe the check that insurance wrote was for approx $50k.	-92.50757261	34.61745571	7	Hidden Creek	Hurricane Creek	0	0	1	1	0.0	0.0	0.0	0.0	2.2	0.7	2.6	1.0
332	Leslie Witt	leslie.hudgeons@gmail.com	Yard	EveryMulti	4798860543	2013 cherry creek cirlce, Bryant, AR 72022	Phone	No	Yes	Our front yard is slightly sloped to the street and any time it rain water drains and sits at the front of our yard. It stays muddy for up to a week after rain almost making it impossible to mow the front half of our yard.	-92.47380242	34.6116232	N/A	Cherry Creek neighborhood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
333	Han cho	Evan1004us@gmail.com	Road	EveryMulti	501-772-0880	2500 cherry creek cir Bryant AR 72022	Email	No	Yes	Every time rain comes, there are water in front of my lot and mes with soils until it dries out for several days. Aspalt road is broken and cracked, puddled with. Definitely needed a repair or replacement of road here	-92.47568709	34.61274265	N/A	Cherry Creek neighborhood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
334	Karen Bonvillain	keymckissock@yahoo.com	Yard	EveryMulti	5012475221	1520 Pleasant Pointe Circle Bryant, AR 72022	Email	No		The neighborhood storm drains are either not large enough damaged, or have a blockage at the outfall. When there is a large amount of rain in a short period of time or a long rain event all of the water ends up at the south end of the neighborhood, flooding yards.	-92.49765327	34.58135012	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	1	1	1	1	0.5	0.9	0.6	1.0	0.8	1.2	0.8	1.3
335	Chalsie Sublett	Thesubletts@yahoo.com	Yard	EveryMulti	5015292169	807 Allyson Avenue Bryant Ar 72022	Email	No	Yes	Side and back yard flood every time we get a good rain. We were told it's because a neighbor has a public drain... either way it's a mess! Our privacy fence is taking damage because of it.	-92.49568956	34.58767573	N/A	Bryant Meadows	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
336	Ron Abrahams		HouseBusiness	Every2	479-857-0160	2616 Carywood Drive	Phone	No		Based on Phone Call 5/12/2022: Water flows down Carywood, crosses from the west side of the road to the east side, and goes over the curb and flows between house his house and the house t the north. The house to the north has been flooded "off its foundation". Don's house has had a little bit of water in it. He has talked with the city about this 2 years ago and he though a project was going to be done to fix it.	-92.48779165	34.61864434	36	Carywood/Raintree Acres	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
343	Debbie Fannon	fannondebb@yahoo.com	Yard	EveryMulti	501-366-3111	1723 Kensington Dr Bryant Ar 72022	Phone	No	Yes	No culvert on our cove. All storm water drains into our yard. Soil erosion so bad it was causing major damage. Paid 10,000 to have trench installed. It helps but still a huge problem. Fence and trees are coming down. Reported it before.	-92.51009711	34.62767073	6	Forest Cove	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
344	Billy R Hardin	billhardin@att.net	Yard	EveryMulti	501-658-0519	Billy R Hardin 706 Sanders Ln Bryant, AR 72022-3732	Email	No	No	I have a French drain underground that takes water from my back yard area to the front yard bordering Sanders Lane. The water fro my yard and water running south on Sanders Ln collide at my driveway. There is no pathway going on south along street for the water to move on to the storm drain at the intersection of Sanders and Griffis. The water backs up and covers my backyard patio and can come into my house.	-92.49579025	34.58848705	N/A	Bryant Meadows	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
345	Jim Gass	Jgass11713@yahoo.com	Yard	EveryMulti	903-949-9209	2513 Johnswood Village Drive Bryant, AR 72022	Phone	No	Yes	Drainage pipe running through yard is not properly sized c discharging. Pipe raises out of the ground during heavy rain events	-92.46953084	34.61592048	22	Johnswood Village	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
350	Matthew Burks	radioscottshady@yahoo.com	Yard	EveryMulti	5013179416	412 Bryant Meadows Drive	Email	Yes		We moved into our home in October and with the recent rains, w discovered that water severely pools all over our yard, so much that you can't walk to our front door without getting the tops of your shoes wet. In light of this, we hired a crew to put in French Drains. When they surveyed, they showed me where there are no storm drains on our road. I then noticed, nobody in our entire neighborhood as one. I had to $7,000 (including $500 for the contractor to get a city permit) to get drainage to a storm drain which is way behind our property, through Bryant House senior living center.	-92.49424287	34.59059456	N/A	Bryant Meadows	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
351	William Knauf	bill_knauf@yahoo.com	Yard	EveryMulti	501-557-8555	2400 Cherry Creek Circle	Email	No		The street in front of my house needs repair several times a year due to underground springs causing road to fall apart. It is again showing signs. Also, my yard and that of my neighbors gets so wet that several neighbors won't mow their lawn due to their lawn mower sinking into the mud. Yesterday I tried to mow one of their yards and had to give up after 3/4 of the yard as both my mower and my feet were sinking so bad. I have lived here almost 11 years and I know my yard never needs o be watered due to how damp the soil is. This is a problem for both the yard and street.	-92.47622211	34.61181498	N/A	Cherry Creek neighborhood	Crooked Creek	0	1	1	1	0.0	0.0	0.9	0.5	0.9	0.6	1.0	0.6
352	Danny Grupa	dannygrupa@gmail.com	Other	EveryMulti	501 722 3356	710 southwest 3rd Bryant, AR 72022	Email	No	Yes	The city has continuously dug my ditch deeper and deeper t where it holds water or mud constantly and is impossible to maintain.	-92.49758306	34.59293717	N/A	Morden	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
353	Steven D Epperson	sdepperson@gmail.com	Road	EveryMulti	5016587956	3319 MEADOW CREEK DR	Phone	No		THE STREET DRAIN BESIDE MY DRIVEWAY HAS COLLAPSED, ALONG WITH THE CONCRETE. THE DRAIN FLOWS INTO A DRAINAGE EASEMENT ON THE BACK OF MY PROPERTY, AND AS YOU FOLLOW THE EASEMENT TOWARDS SHOBE ROAD, THE DRAINAGE IS BLOCKED WITH DEBRIS SUCH AS CONCRETE PIECES AND OVERGROWN VEGETATION. THIS MAKES THE WATER STAND AND STAGNATE INSIDE THE EASEMENT, AND ALSO BREEDS MOSQUITOS. THE EROSION ALONG THIS DRAINAGE EASEMENT HAS ALSO CHANGED THE GRADE SO THAT WATER CANNOT CONTINUE FLOWING TOWARDS SHOBE ROAD. DURING HEAVY RAINS, THE ROAD FLOODS, AS WELL AS THE PORTION OF MY DRIVEWAY BY THE STREET. THERE IS ALSO AN OLDER PIPE THAT WENT UNDER THE STREET BY MY DRIVEWAY THAT HAS COLLAPSED, AND LEFT SEVERAL DEEP HOLES IN THE GROUND WITHIN A COUPLE OF FEET OF MEADOW CREEK DRIVE. THIS AREA IS A DANGER TO CHILDREN PLAYING, AS WELL AS THOSE WHO RIDE BICYCLES ALONG THE STREET.	-92.45556508	34.63363102	34	Lexington Park	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
354	Michael Thompson	Double.dragon.mgt@gmail.com	Other	Every	5018135168	1601 South Lea Circle Bryant, Arkansas 72022	Phone	No		Flood water in barn, yard is often damaged by flood debris from other peoples property. An approximate 8 foot steel gate was torn from someone else’s property and washed up under the bridge th goes over the water run off creek dividing my property. The water and the gate damaged my bridge.	-92.5069324	34.59274879	13	Near Boone Road	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
355	Emilie Monk	Emonk8@att.net	HouseBusiness	EveryMulti	501-920-1717	Emilie Monk 1301 Boone Road Bryant, AR 72022	Phone	No	Yes	Water comes across Boone Road from Richardson Place Subdivision and straight down hill. It started this after new road wa replaced. A culvert was put under street and drains into my yard. It has caused my house to settle and I had to have Olshan to raise i I need the ditch replaced that was on the other side of the road. Water stands under my house causing mildew and moisture. I never had problems until so much building has taken place up stream. I’ve lived here over 30 years. I need the ditch replaced across the street. Every time it rain 1/2 inch it floods .	-92.50375172	34.59503981	12	Boone Road	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
356	michaelreade	readeauto@yahoo.com	Other	EveryMulti	15018476364	1801 n Reynolds rd or PO box 28	Phone	No	No	the culvert is collapsed under dive way at reades automotive have culverts to replace but been argueing with state hwy department f over 1 year to get them put in are sitting by road and ready to be install this would help the drainage on reynolds rd some thanks manager of reades automotive	-92.49520645	34.6105193	N/A	Big Oak	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
357	Dorothy Weaver	dorothy.weaver@att.net	Yard	EveryMulti	5012135066	108 Canyon Way Bryant, AR 72022	Email	No	Yes	Drainage ditch located on Lombard goes through back c properties in Magnolia Village. The ditch was narrow now widen by rain and drainage from opposite of road, the debris has built up so water backs up into the back yard. Debris also has caused a snake problem. The ditch was moved years ago from the property behind the houses to the current location, but there was no rock or anything t prevent the washing out of sides of the ditch. Eventually this will cause fences to be ruined if this washing continues	-92.48728818	34.63851089	29	Magnolia Village	Owen Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
358	John Johnston	pastorjohnj618@gmail.com	Road	EveryMulti	501-213-6793	67 Crain Drive	Phone	No	Yes	At the corner of Crain drive and Craig street every time it rain heavy it floods in that corner and floods back into our yard not adequate amount of transition from one street to the other for drainage..	-92.49384958	34.5989324	40	Southwood Acres	Hurricane Creek	1	1	1	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

359	Danny Grupa	dannygrup@gmail.com	Other	EveryMulti	5017223356	710 sw 3rd Bryant, AR 72022	Email	No	Yes	The city has constantly dug my ditch deeper and deeper. constantly holds water or mud and is impossible to maintain. It has been dug lower than the culverts	-92.49758306	34.59293717	N/A	Morden	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
360	Cara Brookins	cara@carabrookins.com	Road	EveryMulti	5017657041	2107 Hickory Dr Bryant AR 72019	Email	No	Yes	Culvert under street completely filled with dirt and rocks. Ditch pile with dirt/rocks from flooding. Damage to yard, driveway, from repeated failed attempts to solve the ongoing flooding problem for 15 years. Water covers driveway and road during even mild storms. The solutions to date have made mowing and yard management impossible. Snakes have infested the area. We need a long term solution for this mess. I would like to be involved in the process of creating a plan that can be executed and maintained. It's frustrating to deal with this for so long with no viable solutions.	-92.51249974	34.63878693	N/A	Hickory Hill	Hurricane Creek	1	1	1	1	1.9	1.0	2.0	1.1	2.5	1.3	2.7	1.4
361	KEVIN BETHEA	bethea_kevin@yahoo.com	Yard	EveryMulti	8707232619	6150 Remington Drive, Bryant, AR 72022	Email	No	Yes	Water is not draining properly because storm water basin in subdivision is not maintained by city or subdivision. A person that lives in subdivision yard was flooded. There are huge rats living in that basin because it is not maintained. Another comment would be that the city needs to keep shoulders on major roads cleared other than moving 18 inches on the sides of major roads, that would cut back on roads in general flooding.	-92.51796875	34.65829756	N/A	Remington Place	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
362	KRYSTYNA REINHARDT	krystynareinhardt@gmail.com	Yard	EveryMulti		2713 Johnswood Village Drive. Bryant, AR 72022	Email	No	Yes	After rain. Nothing crazy, no storm. There is one foot of water that is sitting at my fence line and doesn't go anywhere for a full day or so. Provided it doesn't rain anymore. If there is a storm with heavy rainfall. Then there is much more water in that location. The property behind us also has sitting water for days. The subdivision has a retention pond, but never has any water in it. The back side of multiple properties need to be addressed and have that water directed towards our retention pond. Also there have been a few times with heavy storms that the culdesac would have standing water during the storm and start moving up to the driveways. Maybe not draining correctly?	-92.46920545	34.61449016	22	Johnswood Village	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
363	Greg Whitehead	greg@controlledautomation.com	Yard	EveryMulti	5017496897	501 Sanders Lane Bryant, AR 72022	Email	No	Yes	Culvert under street is undersized allowing water to backup int yard creating a major problem with flooding the entire yard, including several neighbors flooding	-92.49512003	34.59063835	N/A	Bryant Meadows	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
364	Melissa Lee	mtlee501@gmail.com	Yard	EveryMulti	479-518-6396	200 Ethel Drive Bryant, AR 72022	Phone	No	Yes		-92.49710009	34.61152367	N/A	Big Oak	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
365	Lori Anne Dilatush		Yard	EveryMulti	15014125815	4323 S Shobe Road	Email	No	Yes	The most resent time my back yard was flooded was April 13, 2022. The ditch that runs on my property comes from my neighbor's backyards out to S Shobe Road where it continues to flood. My backyard along with my spare lot has deep standing water in which I am unable to measure due to safety reasons. Every time there is a heavy rain the flooding becomes an issue. Please review the attached pictures.	-92.45410705	34.63307186	34	Lexington Park	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
366	Rachel Cotton	okarkcotton@yahoo.com	Yard	EveryMulti	9188297988	2710 Lavern Street Bryant AR 72022	Email	No	Yes	There is a storm water ditch in my front yard at the road. Th culvert under my driveway is blocked resulting in water running back to my yard. We are down hill so this tends to be a very significant amount of water flooding our yard, driveway, porch steps, as well as our neighbors yard. I have had to relocate my Camaro several times due to the flood level and the running water across my driveway. The driveway is 4-5 inches raised above soil level. There is a major mosquito problem here that I'm sure is from this issue and resulting standing water that never seems to completely dry out. I rent this home and am not sure if this is owner responsibility or city.	-92.49020576	34.61647647	37	Carywood/Raintree Acres area	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367	Julian owen	Julianowen2000@gmail.com	Yard	EveryMulti	5017723890	4322 Lexington park circle Bryant Ar 72022	Email	No	No	Behind my home behind the fence when we get heavy or regular rain the drainage floods coming into my yard and shed. My fence is ruined/ rotted and shed as had a new floor. I've raised my shed 5 inches. So it's 8 inches from ground. So at least 7 inches of flood water approx 25 feet from back fence. I hope I can get a response. I've not been happy with the lack of help from city or the mayor scott	-92.45608408	34.63315444	34	Lexington Park	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
368	Michael & Tamara Guffey	tama_guff@yahoo.com	Other		501 350-7732	1302 Ashlea Place Drive Bryant, AR 72022	Phone	No	Yes	Open drainage easement is washing away soil and has a lot of erosion. Large pieces of the bank have fallen off. We have paid t re-sod and reseed the embankment with more vegetation which does not work because the water rounds the corner too swiftly on that side and also receives additional water from another incoming drain that dumps at that corner of the yard. We mow it to keep the snakes away . Last summer my husband fell into the creek when the ground under him broke off.	-92.50575181	34.62392552	6	Sunset Meadows/Gardens	Hurricane Creek	4	4	4	4	7.0	1.9	7.5	2.2	8.7	3.0	9.1	3.2
369	Elisa Smith	Elisamsmith60@yahoo.com	Yard	EveryMulti	5013505597	1408 Pleasant Pointe Circle Bryant, AR. 72022	Phone	No	Yes	May 2021 (last time I took pictures) but pretty much floods every time it rains. My back yard floods and the water comes up halfway to my house sometimes it is a foot or more deep. Has done this ever since I bought my house in 2008. Before the house behind me was built I complained to the city and someone came out and looked at the problem. Said they talked to the builders and builder would make a ditch to help with the problem. Only thing builder did was build up the ground so the house he was building was higher.	-92.49720252	34.58234127	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
370	John Willix c/o Willix Family Trust	Jwillix@cbrpm.com	Yard	EveryMulti	501-804-4761	3005 Glenbrook St Bryant , AR 72022	Email	No	Yes	5/22/2022. Front yard. Insufficient drainage under the street. Deepest spot 2 ft tappering towards the house to 0 ft about 15 foot from house.	-92.51486679	34.62255107	5	Sherwood Park/Sherwood Estates	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
371	Ting	inti528@yahoo.com.hk	HouseBusiness	Every2	501-410-3505	3317 STILLMAN LOOP, BRYANT, AR 72022	Email	No		We moved in to this house in May 2016. The first flood was April-2017 and then again April-2021. There were 3 inches of water inside our house(whole living room, dinning room, media room and one storage room were all flooded) both time. There is a draining path on the right side of our house for the whole neighborhood and it seems it's not very effective. The flood happened to our next doo neighbor as well. I do not have pictures of the flood as I was carrying my infant as I try to get the water out of my house.	-92.51495472	34.62480161	5	Springhill Manor	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
372	Langdon "Buh" Jones	buhjonesband@gmail.com	HouseBusiness			3508 Village Green Dr.				My house and the neighbors house both flood when it rains heavy	-92.4683215	34.62607402	18	Meadowlake	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
373	Chante Tyson	tysonchante@yahoo.com	HouseBusiness		5017726065	201 Crossing Place Bryant, AR 72022				I've lived in Oak Glen for about 5 years and my house is next to the creek in the back. I've spent a lot more money than planned during storms that affected an entire area of my home due to flooding. Please consider my recommendation to begin the drainage system in Bryant! If I need to submit anything else let me know thanks Chante Tyson	-92.48025615	34.64578109	30	Oak Glenn	Owen Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
374	Denise Townsend	denise.townsend@gmail.com	Yard	EveryMulti	5018477234	3210 Independence Circle Bryant, AR 72022	Email	No		City owned drain in out backyard is not capable of controlling the water. Retention pond overflows every time it rains heavily. The water has come up to our house and almost entered.	-92.50350504	34.62428985	6	West Pointe	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
375	Hannah Diotte	hannahsmothers98@gmail.com	HouseBusiness	EveryMulti	5012850065	50 Wagner St. Bryant, AR 72022	Email	No		Summer 2021 the storm drain was incapable of handling floodwater capacity. Our entire home flooded with water at least 2 in. deep throughout. Our entire outdoor property floods with any/all rainfall.	-92.49765355	34.59009764	40	Southwood Acres	Hurricane Creek	0	1	1	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
376	James Cox	jclakersfan@icloud.com	Road	EveryMulti	5016268266	1318 Crossing Loop				I moved to 1318 crossing loop in Bryant at Back of oak Glenn in 2016. Creek was tiny and way away from my home yet w all the construction it's huge now and has flooded the neighborhood streets nearly every year at least once. Raging rapids and people having to be rescued by boats even. It's not sa and causes stress to us all. It's come up to halfway up my driveway multiple times and im no where close to the creek. City should not of allowed these Rausch Coleman houses to be built there but we love our street and just want it fixed.	-92.47963036	34.6443003	30	Oak Glenn	Owen Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

377	Jennifer Thompson	jenniferlcarson@gmail.com	Yard	EveryMulti	5019443590	1000 Flametree Drive Bryant, AR 72022	Email	No		During medium to heavy storms, 4-5 streams form in our neighbor's yards uphill from us and flow from the neighbor's yard immediately into our back yard. These streams saturate our backyard and form pools of water. It takes days and sometimes weeks for this to dry out. The water in our front yard drains straight through our yard and into our neighbor's driveway, which has resulted in damage to the driveway and flooding to the garage. The character of our yard has changed distinctly within the last several years and we have concerns about the foundation of our home. One thing we'd like to note is there is an easement behind our fence that is supposed to run the length of our street. In the event the easement could be used to somehow direct water to a storm drain the easement is blocked by fences and leaves and will need to be cleared.	-92.48315596	34.61474818	36	Carywood/Raintree Acres	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
378	John Baldwin	jbaldwin@eastersealsar.com	Yard	EveryMulti	5019510516	4009 Commonwealth Dr. Bryant, AR 72022	Email		No	The storm drainage comes from the streets above my home and during heavy rain, the yard floods and the water jumps the curbs on Commonwealth and Robinwood into my front and backyard. W also receive water from the apartments behind my property. The storm drain in front of my yard and the house on Robinwood does not keep up during heavy rains	-92.50068	34.63192346	16	Stoneybrook/Springhill Acres	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
379	Justin Lee Hill	justin_hill@yahoo.com	Yard	EveryMulti	5019432799	603 Mills Park Rd. Bryant, AR 72022	Email	No		I bought my home in 2001 and have never had the problems I have had in the last 6 months because of drainage issues. The erosion has damaged trees, fencing and now i am getting cracks the walls. My fence is a foot lower on onw side compared to the other. I am at the bottom of the hill so I'm getting everything that should be going through the drainage system that has failed. I also have piles of gravel that have collected from the runoff that used to be a filler for the drop off that was left after repaving the road but it is all in my road now. The street dept said they would get the grav up, they came and took a layer but left most of it. I will email pictures.	-92.48198098	34.60008698	35	Bloomfield Hills	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
380	Karma Smoke	karma.smoke@gmail.com	Yard	EveryMulti	5018402430	2317 Chelsea Dr. Bryant, AR 72022	Email	No		My house has settled 5 in on the backside due to the lack of drainage from the rain water. My back porch concrete has dropped and cracked. My driveway is raising up unevenly and cracking	-92.48781345	34.61607873	37	Carywood/Raintree Acres area	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
381	Keith Banks	kgbanks@yahoo.com	Yard	EveryMulti	8707182806	3513 Henson Place Bryant, AR 72022	Email	No		My back yard is in a constant state of flooding. It wasn't like that this time last year. It hasn't rained in days, yet I still have standing water in my backyard. My front yard is consistently soggy. The street in front of my house is always wet. That is creating cracks in the asphalt and its effecting my property.	-92.51092185	34.62740071	1	Springhill Manor	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
382	Kevin Bethea	bethea.kevin@yahoo.com	Road	EveryMulti	8707232619	6150 Remington Dr. Bryant, AR 72022	Email	Yes		water is not draining properly because area is not maintained b city or subdivision. A person that lives in subdivision house was flooded.	-92.51820237	34.65859949	N/A	Remington Place	Hurricane Creek	1	1	2	2	2.6	0.9	2.7	1.1	2.9	1.5	2.9	1.7
383	Paul n Moropoulos	dogtags11@hotmail.com	Yard	EveryMulti	5012130134	706 Holly Lynn Dr. Bryant, AR 72022	Phone	No		The natural flow of water on Ruth ave. has diverted itself i between 701 and 703 Ruth ave. and travels into my yard. This ha been causing flooding and erosion and at times the depth is almo 12 in.	-92.48462732	34.61086984	23	Park Hill	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
384	Sharon Steele	steele.sharon@ymail.com	Yard	EveryMulti	5018020944	42 Neal Cv. Bryant, AR 72022	Email	No		Yard floods every rain and retains moisture even in dry climate. water is at least ankle deep at minimum during time of flooding.	-92.48850713	34.61196359	N/A	Bryant Oaks	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
385	Jeffery Brown	gphodwild66@gmail.com	Yard	EveryMulti	5017650369	705 SE 1st St. Bryant, AR 72022	Email	No		Two storm drains dump into our backyard and over the years have eroded half of our backyard. We extended one of the pipes at our expense or more of the yard would be gone!	-92.48279956	34.59541411	33	Hidden Forest	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
386	Ralph Williams	willaims7732@sbcglobal.net	HouseBusiness	Every10	5017724633	1727 Hidden Creek Dr. Bryant, AR 72022	Phone	No		My entire home has been flooded twice, 1st in 2008 and 2nd in 2017. My garage has been flooded 5 times but the water receded before it entered the house. Storm water travels down Pine Meadow Dr. from highway 5 and from the property of the funeral home and over the curb into my yard. The drop inlet in the intersection of cannot handle the high degree of storm water so th water floods my home. Storm water also overflows the creek on hidden creek dr. and backs up to my house and joins the storm water from pine meadow. It would help is the creek that crosses hidden creek dr. was cleaned and cleared of all debris and foliage from Hidden Creek Dr. to the frontage road on I-30. Also, it would be help greatly if the drop inlet pipes were enlarged at the intersection of Pine Meadow Dr. and Hidden Creek Dr.	-92.50835187	34.61749422	7	Hidden Creek	Hurricane Creek	0	0	1	1	0.0	0.0	0.0	0.0	2.1	1.0	2.5	1.2
387	Joyce Koozer				4694715608	2805 Barbara Court Bryant, AR 72022	Phone				-92.46030764	34.63946487	39	East Ridge	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
388	Marian Langston				5018474218	1104 N Richardson Place Dr. Bryant, AR 72022	Phone				-92.50254372	34.59881372	32	Richardson Place	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
389	Retta Patrick		Yard		5016532424	1206 Kynlee Cv Bryant, AR 72022	Phone			cul-de-sac looks like a pond when flooded; last rainstorm washed out the fence in the backyard	-92.50565919	34.62475852	1	Sunset Meadows/Gardens	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
390	Richard Gentry				4798570160	2616 Carywood Dr. Bryant, AR 72022	Phone				-92.48779165	34.61864434	36	Carywood/Raintree Acres	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
391	Richard Gentry				5014160685	1203 Katrina Dr. Bryant, AR 72022	Phone				-92.49657957	34.58428927	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
392	Ron Abrahams				4798570160	2616 Carywood Dr. Bryant, AR 72022	Phone				-92.48779165	34.61864434	36	Carywood/Raintree Acres	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
393	Pam Gregory		Yard		5018403018	22660 Hwy I-30 N Bryant, AR 72022	Phone			house located at Country Woods Mobile Home Park: lot 43B; lot has flooded 3 times	-92.50169321	34.61921033	N/A	Country Woods	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
394	Emilie Monk	emonk8@att.net	HouseBusiness	EveryMulti	5019201717	1301 Boone Rd. Bryant, AR 72022	Email	No		Every time it rains yard floods. Water runs across street from Richardson Place. Cause flooding in both front and back yards. Flooding has also caused damage to house and sidewalk. Small ditch in backyard fills with liter carried from neighboring yards.	-92.50375172	34.59503981	12	Boone Road	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
395	Kermit Gray		HouseBusiness		5015803356	704 Ruth Drive Bryant, AR 72022	Phone			Damage to house and standing water in yard.	-92.48455708	34.61001228	23	Park Hill	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
396	Lisa newburn	oliverll1@yahoo.com	HouseBusiness	EveryMulti	5013131308	3905 mockingbird cove Benton AR	Email	No	Yes	Multiple times since 2017 but in May & oct 2019 flood water breached the building about 2 inches. The state replaced the drain pipes in 2020 but water was still breaching the property in all units 1-3 but this time not as bad with the latest remediation repairs complete this year costing about $6000. I have lost 2 tenants to this issue of flooding in 2021 and 2022. This year I purchased flood insurance even though I am not in a flood zone.	-92.49024448	34.59138974	N/A	Outside City Limits	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
397	Thomas Woodall	thomaswoodallsr@comcast.net	HouseBusiness	EveryMulti	501 7721194	1613 Rodeo Dr	Email	Yes	Yes	When there is more then 1 inch of rain my yard, front and back floods, more then that the water will get up to my house. The stor water drains for the area into my back yard and there was never a plan to get the water out of our area. The sewer line for this area runs thru the drainage creek behind my house and it floods over the sewer system on a regular basis.	-92.50816781	34.60178293	8	Rodeo Drive	Hurricane Creek	0	0	0	1	0.0	0.0	0.0	0.0	2.3	0.9	2.8	1.1
398	Rosa Reed	reed6611@yahoo.com	Yard		318-542-5389	1620 Pleasant Pointe Circle Bryant, AR 72202	Mail	No	No	My back yard floods and hold standing water when it rains. It i really terrible during medium to heavy rain stores that are consistent for several days	-92.4583961	34.59081068	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
399	Kathy Lewallen	jackielewallen@att.net	Yard	EveryMulti	501-837-3369	307 NW 4th Street Bryant, Arkansas. 72022	Email	No		Water coming off the high school property. House was built in 1937 and haven't had water issues until new building started. Water under house, flooded storage bldg, top soil washed away	-92.49188202	34.59769541	11	Original Town	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	Chris perry	cperry.sds@gmail.com	HouseBusiness	EveryMulti	870-405-7330	5915 Springdale road Alexander, AR 72002	Email	No	Yes	Since the subdivision Remington Estates was built and developed it forces water across Springdale road and my property in volumes x100 than what it was before. This is causing deterioration of my property.	-92.51937131	34.65649761	N/A	Remington Place	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
401	Andrea Hooten	ahooten@aristotle.net	HouseBusiness	Every	501-249-5562	12 Pine Chapel Drive	Email	No	Yes	Floods our carport every flash flood we have.	-92.4986292	34.59646222	N/A	Tanglewood Acres	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
402	Courtney Ashburn	Courtney.ashburn@yahoo.com	Road	EveryMulti	501-842-4004	1113 Fox Chase Dr	Email	No	No	Over flowing Ditch, floods road and in front of my house	-92.49982969	34.58662367	N/A	Bryant Meadows	Hurricane Creek	1	1	1	1	0.3	0.6	0.3	0.6	0.3	0.8	0.3	0.9
403	Michael Sanders	thesandersfive21557@yahoo.com	Road	EveryMulti	501-944-4451	3051 Mount McGregor Benton, AR 82019	Email	No	Yes	Every time it rains the north bound lane of Springhill floods causing dangerous travel conditions and hydroplaning. Drainage ditches need to clean, and roadside scraped of debris. I have lived off of Springhill for 11 years, and City has Nadine nothing to address the issue. Just went thru this hazard today, 5/24 after raining. When there is torrential rain, conditions are even more severe. The flooding occurs between Hint and Baldwin drive. You can also see the homeowners gravel driveway washing in the street.	-92.51516778	34.6369547	N/A	Springhill Road	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
407	ANDREW CALDWELL	punkshoo_83@yahoo.com	Yard	EveryMulti	7276887812	2316 Justus Loop	Phone	No	Yes	Recent water utility work in our area has caused a good bit of sc and rock build up in our gutter in the whole neighborhood. While the holes in the road did get patched no cleanup effort was made. The blockage is causing water to flow into yards and down driveways. I have seem up to an inch of water outside my front door due to these issues	-92.51374554	34.62478933	5	Springhill Manor	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

408	Kenneth Redus Sr	kdbk0410@yahoo.com	Yard	EveryMulti	501-352-0176	8303 Sapphire Dr Alexander, AR 72002	Email	No		Back yard storm water drains all across back and collects on left side of yard facing the house flowing out towards the street. Gets very soggy and water stands for long periods of time after it rains .	-92.48893979	34.66501239	N/A	Stonehill/Stonegate	Owen Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
409	Jared Butler	Jbutler1975@yahoo.com	HouseBusiness	EveryMulti	5015803483	49 Neal Cove Bryant, AR 72022	Email	No	Yes	April 11 and May 25, 2022 we have storm drain issues. Attached are pictures from the hard rain in April. I woke up this morning to similar issues, a flooded basement. The storm drain in the cul-de-sac in front of our house has very large cracks in it. This is causing the soil in and around our side of the street to flow downhill.	-92.48795066	34.61119719	N/A	Bryant Oaks	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
410	Renalta Brown	renaltabrown208@gmail.com	Yard		5016539192	208 South Walnut St 208 South Walnut St	Phone	No	Yes	The pipes under the street.My water pressure is weak. I live 1 mi away from Hill Farm Elem.& The Middle School on South Reynolds road.When either of rhe schools have drainage problems, the water bills around for people living around the school water bills get extremely expensive	-92.48822631	34.5922242	N/A	Original Town	Hurricane Creek	0	0	1	1	0.0	0.0	0.0	0.0	0.9	0.5	0.9	0.6
411	Angela Rogers	Mccloyen@gmail.com	Other	EveryMulti	5019404444	2303 Defoe Circle Bryant AR 72022	Mail	No	No	Our Subdivision has several water issues from fencing floating Back yards flooding. Loss of Electricity. Loss of Wi-Fi the water is a nuisance for our area	-92.47177551	34.61466789	22	Cambridge Place	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
412	Amyre Williams	amyrecollins@yahoo.com	Road	EveryMulti	(870) 821-0208	2117 Defoe Circle Bryant, Arkansas 72022	Mail	Yes	No	In front of my house we literally have a pool of water that will sit their during a storm. It got so bad that my car was damage due to it.	-92.47189336	34.61355355	22	Cambridge Place	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
413	Jan Browning	janb0423@aol.com	Road	EveryMulti	5017736872	305 Roya Lane Apt. 7	Email	No		There is a damaged storm drain at 305 Roya Lane. Specifically over the small creek that runs behind Bryant Brake and Tire and runs along the back of Bright Ideas and Sally Body Shop. The storm drain doesn't clear out and is hindered by limbs, leaves, trash, etc. When it backs up it floods the driveway into our apartment complex and over time, this has caused the cement to crack and fall away	-92.50040197	34.61339001	N/A	Roya Lane	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
414	Lezli Duke	lezli.duke76@gmail.com	Yard	EveryMulti	(501) 413-0118	2311 Defoe Circle Bryant, AR 72022	Email	No	Yes	The streets flood when it rains, my back yard and side yard floods And stays wet for days. The circles where the drains are you can't drive through it for an hour or hours. Some neighbors front yards have small rivers going through them when it rains. I have one in the back yard when it rains. The yards stay wet for days.	-92.47177367	34.61486348	22	Cambridge Place	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
416	Cheryl kendrick	Ckendrick86@comcast.net	Yard	EveryMulti	5013501169	2217 Defoe circle	Phone	No	Yes	I have severe flooding in my back yard! I've sent pictures. This occurs several times per year. Water comes up to first step of my deck and entire back yard looks like a lake	-92.47158098	34.61407755	22	Cambridge Place	Crooked Creek	1	1	2	2	2.1	1.1	2.3	1.3	2.7	1.6	2.9	1.7
417	Charles Lucas	c.v.lucas00@gmail.com	Road	EveryMulti	5015291914	2411 Defoe Bryant, AR	Phone	No		Flash flooding often occurs during rainstorms in the lower lying area of the neighborhood. It make access to the Shobe entrance impassable at times	-92.47031442	34.6123328	22	Cambridge Place	Crooked Creek	0	0	1	1	0.0	0.0	0.0	0.0	0.5	0.8	0.5	1.4
418	Jack Moaelwy	Jackmoseley1956@yahoo.com	Yard	EveryMulti	5014254046	1215 Woodland Park Road Bryant Ar. 72022	Email	No	Yes	On the southwest corner of my property after a significant rain my property floods because of unnatural and diverted storm drainage problems	-92.51282496	34.60671245	N/A	Woodland Park	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
419	Connie Murdock	wcajunconnie@sbcglobal.net	HouseBusiness	Every	501-590-1284	2212 Defoe Circle Bryant	Phone	No		Yards completely flooded with water FEET deep. Flowing like a river. Home across the street has flooded	-92.47189838	34.61445953	22	Cambridge Place	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
420	Gail Taylor	gailbtaylor@yahoo.com	Yard	EveryMulti	5019207116	1308 Pleasant Pointe Circle	Phone	No	Yes	By backyard floods and backs up. It seems to be getting worse with each rain. I have a video I can send you - please let me know how/where to send it. i know there is a natural spring that runs behind and between my house and the houses on Katrina	-92.49718	34.58258	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
421	Charlotte Paape	permpart@gmail.com	Other	EveryMulti	501-258-0618	1503 Pleasant Pointe Circle Bryant, AR 72022	Email	No		The street in front of my house and into the curve floods every time there is a heavy rain. Sometimes coming over the curbs and sidewalks into my front yard and neighbors on both sides of the street. Also, the back yard floods during these heavy rains. We have personally cleaned out the debris from the culvert area in the back yard for years and that helps, but the problem appears to be from where there is no where for the water to go in the back now for the homes at the entrance to Pleasant Pointe circle. Both front and back of property is affected. Storage building in back has also been flooded. (Can't select more than 1 below so selected other.)	-92.49782881	34.58173015	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
422	ANGIE L CARLOCK	angiecarlock@gmail.com	Yard	EveryMulti	8706721215	2201 Greenleaf Drive Bryant, AR 72022	Email	No		I live at the end of Greenleaf Drive. There is a significant drainage issue in my yard (the worst is in the backyard), the woods behind my fence and a large portion of the park beside my house. There currently nowhere for this area to drain because there isn't anywhere in the area that is lower than these locations.	-92.46816471	34.62370576	18	Meadowlake	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
423	sally keffer	keffersck@yahoo.com	HouseBusiness	Every	8704568611	2209 DeFoe Circle Bryant, Ar. 72022	Email	No		Whenever it rains; not even a lot, it floods my backyard, and my house; it actually comes up in my house; it has washed sink holes in my neighbor to the north of me yard. It tears my fence down, if I am not home; which is a good thing; as the water has to pour out between my house and the neighbors house to drain into the street to get out of our entire neighborhood. That drainage pipe in my backyard is not sufficient enough to handle what comes down that hill behind me. And now that the large lot has been. Cleared for more development you can already see that the expected direction of drainage from that project will be even more water into our backyards and into our homes.	-92.47184399	34.61401167	22	Cambridge Place	Crooked Creek	0	0	1	1	0.0	0.0	0.0	0.0	1.8	0.7	2.1	0.8
424	Donna Hanley	dnnhnly@yahoo.com	Yard	EveryMulti	5019934510	1806 Briarwood Cove Bryant	Phone	No	Yes	A large from the street empties onto my property. Also water drains onto my property from 1802 and 1804. I have numerous pictures of my backyard flooding	-92.50313087	34.61170601	N/A	Edgewood	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
425	Annetta Massanelli	annettamassanelli@sbcglobal.net	Yard	EveryMulti	501-541-0789	416 Derek Court Alexander, AR 72002 Can get clearer pictures-these are from a video	Email	No	Yes	I've been in my home for 10+ yrs. The rain runoff from my neighborhood has progressively worsened. I recently had an engineering company assess the situation and they advised that french drain across the N and W side of my house, including a catch basins at the NW corner and along the N drain path would be required to alleviate the excessive amount of storm water. Neighbors to the W and N have downspouts directed toward my property along with both lawns sloping toward my property as well feel confident that the terrain beyond my adjacent neighbors' property also directs storm runoff into mine. I have lots of erosion issues. I have added flower beds around my house, as a barrier, to keep the water at bay and from, hopefully, adversely affecting my home's foundation. My garage side door and it's frame has recently been replaced due to water drainage and rot via flooding. I would gladly welcome any help I can get to eliminate this perpetual rain water issue I have at my home.	-92.49051904	34.63655182	N/A	Meadowridge	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
426	Verma Dalrymple		Yard	EveryMulti	5017470204	724 Elkhart	Phone	No	No	During rain events, water will cross yard to where they cannot access utility house where mower, shop vac are kept. Low area of yard cannot be mowed much of year. In 5 years of living there, water has gotten in the house 1 time. Sometimes water will get on patio. Next door neighbor Peterson has taken photos of the flooding.	-92.496927	34.5855435	N/A	Bryant Meadows	Hurricane Creek	1	1	1	1	1.2	0.5	1.4	0.6	1.8	0.7	1.9	0.8
427	Debbie Fannin		Yard	EveryMulti	5013663111	1723 Kensington Drive	Phone	No	No	When they built house, did not put culvert in cul-de-sac, but it looks like there should have been one there. House is on slant, and flooding has caused exposed pipes and trees to lean toward neighbors. Water has not gotten in the house. Lot receives lots of runoff from area, more than neighbors. Fence has fallen. Paid for landscaper to put in rock creek to flow into a ditch, but afraid this will cause flooding on other neighbors.	-92.50813374	34.62771488	6	Forest Cove	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
428	CJ Thomas		Yard	EveryMulti	5014633132	1003 Sunset Gardens	Phone	No		Based on phone call, water comes from the Plaza and leaves the plaza at the northwest corner and ponds behind her yard and her two neighbors yards to the north. It gets fairly deep in her back hard and has come all the way up to her deck.	-92.50423753	34.62306345	6	Sunset Meadows/Gardens	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
429	Patricia Louks		Yard		5018470220	1008 S. Richardson Place	Phone	No	No	Ditch next to house floods often. Not cleaned out by others. Oak tree in yard was eroded and roots exposed - cut tree, but afraid will lose this area of land if it falls into channel. Channel has been dug out in the past but grown up down the road. Water has not gotten in house but most of yard floods, cannot get to utility house when it floods.	-92.50106213	34.59627975	32	Richardson Place	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
430	Justin Hill	justin_hll@yahoo.com	Yard	EveryMulti	5019432799	603 mills park road Bryant AR 72022	Phone	No	Yes	I dug trenches to try and divert the water so more goes into the drain/ditch but I can't get it right	-92.48198098	34.60008698	35	Bloomfield Hills	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
431	Marian Langston		Yard	EveryMulti	5018474218	1104 N Richardson Place	Phone	No		Per phone call, the water comes across the backyards from the west and a significant amount of water rushes across her backyard and erodes the dirt and has exposed the foundation of her patio. She can not tell where exactly the water is coming from, she thinks it is just coming across everyones backyards.	-92.50254372	34.59881372	32	Richardson Place	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

432	Joyce Koozer		Yard	EveryMulti	4694715608	2805 Barbara Ct	Phone	No		Per phone call, water comes from the field NW of her house an floods her backyard and her two neighbors to the south backyards She thinks that it might have something to do with a ditch that was dug along the edge of the field that appears to have a dam at the end of it. The water has come up to her back patio and takes a long time to recede	-92.46030764	34.63946487	39	East Ridge	Crooked Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
433	Richard Gentry		Yard	EveryMulti	5014160685	1203 Katrina Dr	Phone	No		Per phone call, there are underground springs coming into his backyard as well as water coming from the street down the driveway that keep his backyard and his neighbors backyard behind him covered in water frequently. The driveway looks as though it could be modified to prevent water from exiting the street.	-92.49657957	34.58428927	N/A	Pleasant Pointe/Cedarwood	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
434	Joe Fast	accu-01@sbcglobal.net	Road	EveryMulti	870-917-8047	105 SW 4th Street Bryant, AR 72022	Phone	No	Yes	I have dates of flooding on pictures, it is several times a year. The ditches are not deep enough and are not kept cleaned out. The culvert on Reynolds Road before the church backs up because of poor installation of the culvert. SW 4th street at Reynolds Rd. backs up on the street, building facing Reynolds Road floods. Have had flood water in building on several occasions. Road floods a couple blocks down by apartments. If the photos do not come thru with this form please let me know, I will print them or email them separately.	-92.49049331	34.59143484	N/A	4th Street/Reynolds Rd	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
435	Glenda Royal	glroyal@sbcglobal.net	Yard	EveryMulti	5015299775	1101 Sunset Gardens East	Phone	No			-92.50460927	34.62269557	6	Sunset Meadows/Gardens	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
436	Glenda Royal	glroyal@sbcglobal.net	Yard	EveryMulti	5015299775	1101 Sunset Gardens East Bryant, AR 72022	Phone	No		Back Yard stays very wet almost continually	-92.50461	34.6227	6	Sunset Meadows/Gardens	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
437	Duane Purtell		HouseBusiness	Every2	9134888656	12939 S Constance St Olathe, KS 66062	Email	No		The city of Bryant is dumping street and drainage ditch water from Robinhood Drive and Springhill Rd into a pond on our property at 2702 Springhill Rd. We have an issue with beavers building dams blocking the pond overflow. In the past 5 years, we have spent approximatley $8,000 to trap the beavers and have had to consistently remove the beaver dams. We are concerned that if th beavers are left alone, the houses bordering the pond will flood. The city has even installed and enlarged a culvert under Robinhood Dr to move water from the north side of Robinhood Dr into the pond on our property in addtion to the water from the drainage ditch on the south side of Robinhood Dr.	-92.51540625	34.6196614	N/A	Springhill Road	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
438	Robert E Roedel	roblovesbryant@gmail.com	HouseBusiness	Every2	5019442220	204 Richwood Drive	Email	No		Homes along Boone Road between Reynolds Road and Tanglewood	-92.49131412	34.59608616	11	Original Town	Hurricane Creek	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Appendix B

Flood insurance policy data and repetitive loss data for the City of Bryant was acquired from the State NFIP Office. Insurance policy information is listed, followed by repetitive loss data.

Insurance Provider	Parameters	Grand Total	BRYANT, CITY OF (050308)
Grand Total	Policy Count	67	67
	Contract Count	67	67
	Premium + FPF	$43,091	$43,091
	Building Coverage	$14,050,700	$14,050,700
	Contents Coverage	$4,276,000	$4,276,000
	Avg. Building Coverage	$209,712	$209,712
	Avg. Contents Coverage	$77,745	$77,745
Allstate Insurance Company (19232)	Policy Count	8	8
	Contract Count	8	8
	Premium + FPF	$3,832	$3,832
	Building Coverage	$1,650,000	$1,650,000
	Contents Coverage	$620,000	$620,000
	Avg. Building Coverage	$206,250	$206,250
	Avg. Contents Coverage	$88,571	$88,571
American National Property & Casualty Company (28401)	Policy Count	1	1
	Contract Count	1	1
	Premium + FPF	$467	$467
	Building Coverage	$250,000	$250,000
	Contents Coverage	$100,000	$100,000
	Avg. Building Coverage	$250,000	$250,000
	Avg. Contents Coverage	$100,000	$100,000
Assurant, DBA: American Bankers Insurance Company of Florida (10111)	Policy Count	17	17
	Contract Count	17	17
	Premium + FPF	$8,944	$8,944
	Building Coverage	$3,502,000	$3,502,000
	Contents Coverage	$758,000	$758,000

	Avg. Building Coverage	$206,000	$206,000
	Avg. Contents Coverage	$63,167	$63,167
Auto-Owners Insurance Company (18988)	Policy Count	2	2
	Contract Count	2	2
	Premium + FPF	$1,224	$1,224
	Building Coverage	$500,000	$500,000
	Contents Coverage	$200,000	$200,000
	Avg. Building Coverage	$250,000	$250,000
	Avg. Contents Coverage	$100,000	$100,000
Farmers Insurance Group, DBA: Fire Insurance Exchange (21660)	Policy Count	5	5
	Contract Count	5	5
	Premium + FPF	$3,823	$3,823
	Building Coverage	$887,400	$887,400
	Contents Coverage	$214,000	$214,000
	Avg. Building Coverage	$177,480	$177,480
	Avg. Contents Coverage	$71,333	$71,333
Hartford Fire Insurance Company (19682)	Policy Count	1	1
	Contract Count	1	1
	Premium + FPF	$2,922	$2,922
	Building Coverage	$500,000	$500,000
	Contents Coverage	$0	$0
	Avg. Building Coverage	$500,000	$500,000
	Avg. Contents Coverage		
Hartford Underwriters Insurance Company (30104)	Policy Count	2	2
	Contract Count	2	2
	Premium + FPF	$905	$905
	Building Coverage	$400,000	$400,000
	Contents Coverage	$160,000	$160,000
	Avg. Building Coverage	$200,000	$200,000
	Avg. Contents Coverage	$80,000	$80,000
Homesite Insurance Company (17221)	Policy Count	1	1
	Contract Count	1	1
	Premium + FPF	$780	$780

	Building Coverage	$200,000	$200,000
	Contents Coverage	$80,000	$80,000
	Avg. Building Coverage	$200,000	$200,000
	Avg. Contents Coverage	$80,000	$80,000
Liberty Mutual Fire Insurance Company (23035)	Policy Count	2	2
	Contract Count	2	2
	Premium + FPF	$1,094	$1,094
	Building Coverage	$400,000	$400,000
	Contents Coverage	$160,000	$160,000
	Avg. Building Coverage	$200,000	$200,000
	Avg. Contents Coverage	$80,000	$80,000
National General Insurance Company (23728)	Policy Count	2	2
	Contract Count	2	2
	Premium + FPF	$1,170	$1,170
	Building Coverage	$450,000	$450,000
	Contents Coverage	$180,000	$180,000
	Avg. Building Coverage	$225,000	$225,000
	Avg. Contents Coverage	$90,000	$90,000
NFIP Direct Servicing Agent (99999)	Policy Count	8	8
	Contract Count	8	8
	Premium + FPF	$4,261	$4,261
	Building Coverage	$1,523,300	$1,523,300
	Contents Coverage	$520,000	$520,000
	Avg. Building Coverage	$190,413	$190,413
	Avg. Contents Coverage	$74,286	$74,286
Occidental Fire and Casualty Company of North Carolina (23248)	Policy Count	1	1
	Contract Count	1	1
	Premium + FPF	$463	$463
	Building Coverage	$200,000	$200,000
	Contents Coverage	$80,000	$80,000
	Avg. Building Coverage	$200,000	$200,000
	Avg. Contents Coverage	$80,000	$80,000
Philadelphia Indemnity Insurance Company (18058)	Policy Count	1	1
	Contract Count	1	1
	Premium + FPF	$2,033	$2,033

	Building Coverage	$500,000	$500,000
	Contents Coverage	$50,000	$50,000
	Avg. Building Coverage	$500,000	$500,000
	Avg. Contents Coverage	$50,000	$50,000
Southern Farm Bureau Casualty Insurance Company (18325)	Policy Count	8	8
	Contract Count	8	8
	Premium + FPF	$5,869	$5,869
	Building Coverage	$1,388,000	$1,388,000
	Contents Coverage	$474,000	$474,000
	Avg. Building Coverage	$173,500	$173,500
	Avg. Contents Coverage	$79,000	$79,000
USAA General Indemnity Company (02003)	Policy Count	6	6
	Contract Count	6	6
	Premium + FPF	$4,197	$4,197
	Building Coverage	$1,325,000	$1,325,000
	Contents Coverage	$530,000	$530,000
	Avg. Building Coverage	$220,833	$220,833
	Avg. Contents Coverage	$88,333	$88,333
Westfield Insurance Company (24112)	Policy Count	1	1
	Contract Count	1	1
	Premium + FPF	$375	$375
	Building Coverage	$125,000	$125,000
	Contents Coverage	$50,000	$50,000
	Avg. Building Coverage	$125,000	$125,000
	Avg. Contents Coverage	$50,000	$50,000
Wright National Flood Insurance Company (11523)	Policy Count	1	1
	Contract Count	1	1
	Premium + FPF	$732	$732
	Building Coverage	$250,000	$250,000
	Contents Coverage	$100,000	$100,000
	Avg. Building Coverage	$250,000	$250,000
	Avg. Contents Coverage	$100,000	$100,000

ID	NFIP Insured	Address	Date Of Loss 1	Occupancy	Currently Mapped Flood Zone	Building Payment 1	Contents Payment 1	Building Value	Date Of Loss 2	Building Payment 2	Contents Payment 2	Date Of Loss 3	Building Payment 3	Contents Payment 3	Date Of Loss 4	Building Payment 4	Cumulative Building Payment	Cumulative Contents Payment	Total Losses	Total Paid	Average Paid
1	NO	2617 HENSON PL	1/23/2020	SINGLE FMLY	X	$ 13,400.77	$ 19,608.44	$ 164,882.00	4/22/2018	$ 29,368.86	$27,047.17	4/3/2008	$ 38,860.71	$ 13,114.47	4/29/2006	$ 10,337.31	$ 91,967.65	$ 59,770.08	4	$ 151,737.73	$ 37,934.43
2	NO	1302 KENSINGTON DR	4/29/2017	SINGLE FMLY		$ 13,604.01	$ -	$ 248,473.00	4/4/2008	$ 15,567.65	$ -						$ 29,171.66	$ -	2	$ 29,171.66	$ 14,585.83
3	YES	1703 RODEO DR	5/18/2021	SINGLE FMLY	X	$ 20,565.90	$ 62.14	$ 485,674.00	4/18/2019	$ 31,907.26	$ 20.96						$ 52,473.16	$ 83.10	2	$ 52,556.26	$ 26,278.13
4	NO	2616 HENSON PL	5/18/2021	SINGLE FMLY	X	$ 20,809.90	$ -	$ 249,224.00	4/30/2017	$ 10,412.86	$ 7,071.59						$ 31,222.76	$ 7,071.59	2	$ 38,294.35	$ 19,147.18

Appendix C

The City of Bryant currently has 35 Letters of Map Amendments. They are listed below.

Case Number	Street Address	Outcome - What is removed from SFHA	Flood Zone	1% Annual Chance Flood Elev	Lowest Adjacent Grade Elev	Lowest Lot Elev
22-06-0450A	3001 Creekside Dr.	Property	X (shaded)	-	-	330.3
22-06-3699A	2331 Abigail Dr.	Structure	X (unshaded)	-	441.9	-
22-06-1241A	6133 Creekside Dr.	Property	X (shaded)	-	-	330.4
22-06-2782A	1805 Boone Rd.	Structure (Residence)	AE	357.3	355.7	-
03-06-1589A	312 Fair Oaks Dr.	Structure	X (unshaded)	379.5	381.5	-
03-06-2164A	1101 South Richardson Place Dr.	Structure	A	375.2	375.5	-
04-06-1646A	201 Fair Oaks Dr.	Structure	X (unshaded)	374.6	375.5	-
04-06-480X	1101 South Richardson Place Dr.	Structure	X (unshaded)	374.6	375.5	
11-06-0025A	1301 Boone Rd.	Property	X (unshaded)	365	378.6	365.1
12-06-3701A	2109 Defoe Circle	Structure	X (unshaded)	-	349.5	-
12-06-4143A	5409 Glenn Cove	Structure	AE	-	362.7	-

Case Number	Street Address	Outcome - What is removed from SFHA	Flood Zone	1% Annual Chance Flood Elev	Lowest Adjacent Grade Elev	Lowest Lot Elev
13-06-1295A	Lot 62, Kings Crossing	Structure	X (unshaded)	346.2	348.8	-
13-06-1437A	2202 Ridgecrest Dr.	Structure (Residence)	AE	373.2	371.3	-
13-06-1893A	100 Medinah Blvd.	Structure (Building 1)	X (unshaded)	361	362	-
13-06-3085A	600 Par Dr.	Structure (Building 1)	X (shaded)	-	368.6	-
14-06-0513A	803 Mills Park Road	Structure	X (unshaded)	-	378.3	-
14-06-4256A	1008 Hazelwood Circle	Structure (Residence)	X (unshaded)	-	378.6	-
15-06-0063A	1805 Boone Rd.	Structure (Residence)	X (shaded)	-	355.7	-
15-06-1282A	Lots 19, 20, 21, 70, 75, 76, 77 and 78, Oak Glenn Subdivision	Portion of Property	X (shaded)	-	-	366.5
15-06-1283A	Lots 28-32, The crossing at Oak Hill	Property	X (shaded)	366.9	-	367.5
15-06-1362A	1014 North Richardson Place	Structure	X (unshaded)	-	382.2	-
16-06-0950A	2119 Byron Dr.	Structure (Residence)	X (unshaded)	-	348.2	-
16-06-2592A	204 Crossing Place	Structure	X (shaded)	-	369.3	-
16-06-3583A	5354 Buckingham Place	Structure	X (unshaded)	-	352.4	-

Case Number	Street Address	Outcome - What is removed from SFHA	Flood Zone	1% Annual Chance Flood Elev	Lowest Adjacent Grade Elev	Lowest Lot Elev
17-06-0060A	14 Eastwood Dr.	Structure	X (shaded)	-	352.7	-
17-06-0900A	2514 Ridgecrest Dr.	Structure (Residence)	X (unshaded)	-	386.6	-
17-06-3332A	1109 Boone Road	Structure	X (unshaded)	-	370.8	-
17-06-4286A	5334 Buckingham Place	Structure (Residence)	X (shaded)	-	350.1	-
19-06-2159A	5409 Glenn Cove	Structure	X (shaded)	-	364.2	-
19-06-3179A	1102 Oak Glenn Loop	Structure (Residence)	X (shaded)	-	363.5	-
20-06-0848A	1002 South Richardson Place	Structure	X (unshaded)	-	377.1	-
98-06-1118A	Lots 1-4, Cambridge Place Subdivision	Structure	A	-	-	-
99-06-1947A	304 Fair Oaks Dr.	Structure	X (unshaded)	379.6	389.4	-
99-06-2083A	1013 S. Richardson Place Dr.	Structure	X (unshaded)	373	374	-
99-06-247A	Lot 34, Richardson Place	Structure	A	-	-	-

Appendix D

Roadway functional classification data was taken from ArDOT and listed below.

Route Type	Cross Drain Design Event	Storm Drain/Side Drain/Pavement Drainage Design Event
Interstate Projects	50-year	50-year
Principal Arterials	50-year	10-year
Minor Arterials	50-year	10-year
Major Collectors	25-year	10-year
Minor Collectors	25-year	10-year
Local Highways	10-year	2-year

Street Name	Functional Class
I-30E/I-30W	Interstate
Highway 183	Minor Arterial
Highway 5	Minor Arterial
Boone Road	Minor Arterial
Mills Park Road	Minor Arterial
Springhill Road	Minor Arterial
Alcoa Road	Minor Arterial
Alcoa Overpass	Minor Arterial
Hilldale Road	Minor Arterial
Midland Road	Minor Arterial
S. Shobe Road	Minor Arterial
Wilkerson Road	Minor Arterial
Cynamide Road	Minor Arterial
Springhill Road	Minor Arterial
Anderson Lake Road	Major Collector
Bishop Road	Major Collector
Boswell Road	Major Collector
Brookwood Road	Major Collector
Carmichael Road	Major Collector
Carrie Drive	Major Collector
Cedar Driver	Major Collector
Commonwealth Drive	Major Collector

Street Name	Functional Class
Debswood Drive	Major Collector
Elaine Place	Major Collector
Evans Loop Road	Major Collector
Hickory Drive	Major Collector
Hilltop Road	Major Collector
Hurricane Lake Road	Major Collector
Indian Springs Drive	Major Collector
Johnswood Road	Major Collector
Lexington Avenue	Major Collector
Lombard Road	Major Collector
Lora Drive	Major Collector
Miller Road	Major Collector
Mills Park Road	Major Collector
Neal Street	Major Collector
Northlake Road	Major Collector
N. Prickett Road	Major Collector
N. Shobe Road	Major Collector
NW 4th Street	Major Collector
Park Road	Major Collector
Pine Drive	Major Collector
Prange Road	Major Collector
Prickett Road	Major Collector
Raymar Road	Major Collector
Ridgecrest Drive	Major Collector
Ruth Drive	Major Collector
Snow Lane	Major Collector
Springdale Road	Major Collector
Springhill Road	Major Collector
S. Shobe Road	Major Collector
S. Spruce Street	Major Collector
SW 3rd Street	Major Collector
SW 4th Street	Major Collector
Wildwood Road	Major Collector
W. Meadowbrook Street	Major Collector
Woodland Drive	Major Collector

Street Name	Functional Class
Woodland Park Road	Major Collector
Zuber Road	Major Collector

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Comprehensive Drainage Master Plan

City of Bryant

Phase 2 Report

Prepared by:

GARVER

4701 Northshore Drive

North Little Rock, Arkansas 72118

January 2025

Garver Project No.: 20T20090

Table of Contents

Appendices

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1.0 Overall Project Description

A Comprehensive Drainage Master Plan (CDMP) is being developed for the City of Bryant. The purpose of the City of Bryant CDMP is to:

- Evaluate the existing drainage conditions of the City and Extra-Territorial Jurisdiction (ETJ), also known as the planning area;
- Identify current and future drainage problems;
- Generate proposed solutions to identified problems;
- Develop a Capital Improvement Plan (CIP); and
- Provide tools for managing future development.

The CDMP project is being performed in two (2) phases. Phases 1 and 2 will be divided into major tasks, with subtasks listed as applicable below these major tasks. **Figure 1** shows a flow chart of the overall project process.

- Phase 1: Data Collection and Initial Drainage Study Screening
- Phase 2: Survey Collection, Hydrologic and Hydraulic Modeling, Identification of Drainage Problems, Alternative Development, and CIP Development

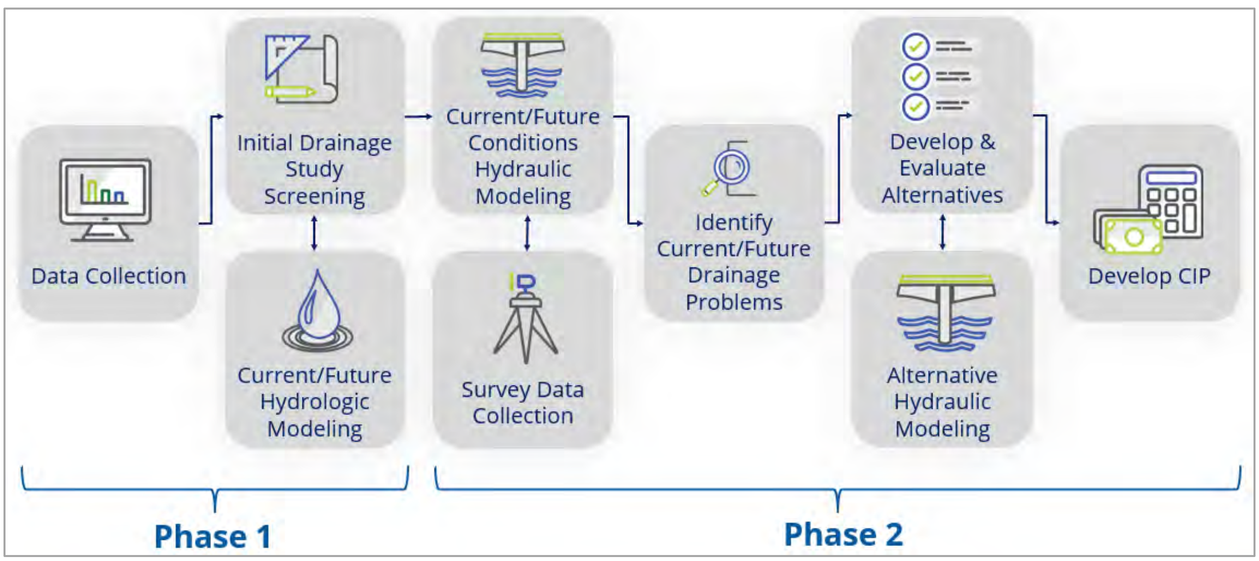

Figure 1. CDMP Project Process

This report discusses the processes and findings of Phase 2.

2.0 Phase 2 Overview

Phase 1 was completed and submitted to the City in 2023. At the end of Phase 1, Garver met with the City to discuss the identified potential problem areas and select locations for detailed study in Phase 2. These problem areas were listed in the Phase 1 report. Along with these identified problem areas, Garver provided a list of recommended hydraulic models for Phase 2. This list is shown below in Table 1. During the Phase 2 process, some additions and removals were made based on discussions with the City. These are noted in the table.

Table 1. Recommended Hydraulic Models for Phase 2

Stream/ Location	Model Extents	Model Type	Project Location	Phase 2 Updates
Shoal Creek	Confluence with Hurricane Creek up to Kensington Drive	1D HEC-RAS	Forest Cove/ Hidden Forest Drive/ Rodeo Drive	Model substantially complete; LOMR to be completed following addition of City project work
Shoal Creek Tributary (previously called Unnamed Tributary)	Confluence with Shoal Creek up to Kensington Drive	1D HEC-RAS	Sherwood Estates/ Northridge Ph 2/Forest Cove/Springhill Manor	Model substantially complete; LOMR to be completed following addition of City project work
Hurricane Creek	Highway 183 to Hurricane Lake	1D and 2D HEC-RAS (Boone Road portion performed during Phase 1)	Boone Road/ Cynamide Road	N/A
Boswell Creek	Confluence with Hurricane Creek to Boswell Road	1D HEC-RAS	Boone Road	Richardson Place removed as problem location to be analyzed

Stream/ Location	Model Extents	Model Type	Project Location	Phase 2 Updates
Meadowlake Subdivision	Meadowlake neighborhood	XPSWMM	Whole neighborhood	N/A
Unnamed Tributary to Crooked Creek	Confluence with Crooked Creek to southwest corner of Meadowlake neighborhood	1D HEC-RAS	Shobe Road	N/A
Owen Creek	Confluence with Fourche Creek to 1,000 ft upstream of Hilldale Road (East-West)	1D HEC-RAS	Hilldale Road/ Midland Road	N/A
Owen Creek Tributary and Tributary A	Confluence with Owen Creek to upstream of Roman Heights Ave; Lombard Road	1D HEC-RAS (downstream reach performed in Phase 1)	Oak Glenn Neighborhood	Model extended; City decided to remove study of Oak Meadows/Roman Heights/Dawson Pointe; potential additional study of Oak Glenn discussed
Hidden Forest Subdivision	Hidden Forest neighborhood	XPSWMM	Whole neighborhood	Neighborhood added to list by City following Phase 1 report

3.0 Phase 2 Study Locations

The project study areas for Phase 2 are described in detail in separate reports included in the appendices to the Phase 2 report. A description of each is given below.

Table 2. List of Problem Locations and Solutions

Appendix	Problem Location	Conceptual Solution
A	Boone Road at Hurricane Creek	Lengthen Hurricane Creek bridge; add relief culvert to west; raise roadway
B	Boone Road at Boswell Creek	Upsize culverts at Hurricane Creek; improve channel in vicinity of Boone Road
C	Cynamide Road at Hurricane Creek	Replace culverts with longer bridge; raise roadway
D	Hidden Forest Subdivision	Improve ditches; increase storm pipe capacity
E	Meadowlake Subdivision	Improve ditches; increase storm pipe capacity
F	Midland and Hilldale Roads at Owen Creek	Lengthen bridges; raise roadways
G	Hidden Creek Drive and Rodeo Drive at Shoal Creek	Increase culvert size at Hidden Creek Drive; detention pond near Shoal Creek
H	Shobe Road at Unnamed Tributary to Crooked Creek	Raise roadway; lengthen bridge; detention pond
I	Oak Glenn Subdivision	Improve channel throughout neighborhood; increase culvert sizes
J	Lea Circle	Buyout properties

4.0 Conceptual Layout and Planning Level Opinion of Project Costs

Conceptual layout drawings and planning level opinions of project costs are provided in the appendix following each project report. These layouts are for graphical and planning purposes only and are not for construction.

5.0 Prioritization of Projects

A preliminary prioritization project list will be provided to the City for review and comment. The final list of prioritization will be included in the final draft of this report.

6.0 Next Steps

Once prioritization of the projects has been completed, the City can utilize this list to focus on procuring construction level plans for those projects listed as highest priority.

Additionally, the Letter of Map Revision (LOMR) planned for Shoal Creek and Shoal Creek Tributary should be finalized and submitted to FEMA following completion of drainage improvements currently being performed by the City.

Appendix A

Phase 2

Boone Road at Hurricane Creek Improvements

Comprehensive Drainage Master Plan

City of Bryant

Phase 2

Boone Road at Hurricane Creek Improvements

Prepared by:

GARVER

4701 Northshore Drive

North Little Rock, Arkansas 72118

January 2025

Garver Project No.: 20T20090

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Appendices

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1.0 Overall Project Description

A Comprehensive Drainage Master Plan (CDMP) is being developed for the City of Bryant. The purpose of the City of Bryant CDMP is to:

- Evaluate the existing drainage conditions of the City and Extra-Territorial Jurisdiction (ETJ), also known as the planning area;
- Identify current and future drainage problems;
- Generate proposed solutions to identified problems;
- Develop a Capital Improvement Plan (CIP); and
- Provide tools for managing future development.

The CDMP project is being performed in two (2) phases. Phases 1 and 2 will be divided into major tasks, with subtasks listed as applicable below these major tasks. **Figure 1** shows a flow chart of the overall project process.

- Phase 1: Data Collection and Initial Drainage Study Screening
- Phase 2: Survey Collection, Hydrologic and Hydraulic Modeling, Identification of Drainage Problems, Alternative Development, and CIP Development

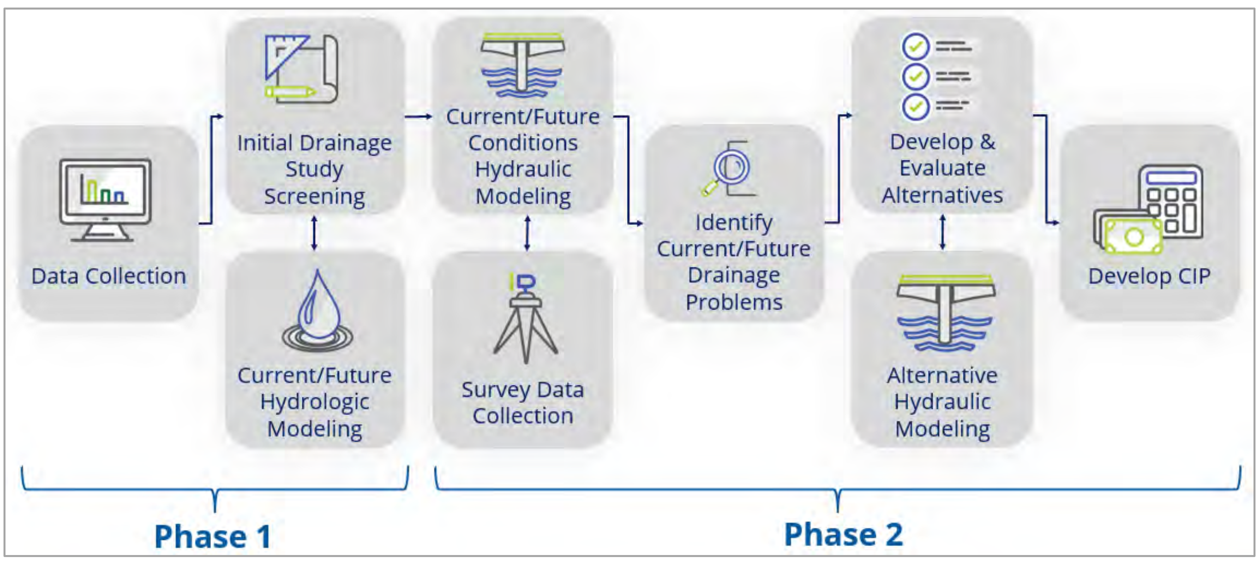


Figure 1. CDMP Project Process

This report discusses the processes and findings of a Phase 2 study of Boone Road at Hurricane Creek.

2.0 General Location Information

Boone Road is a minor arterial class roadway in the City of Bryant connecting Alcoa Road and Reynolds Road (Highway 183). The entirety of Boone Road is located in the Hurricane Creek Basin, with a bridge crossing over Hurricane Creek located near Bishop Park. A project location map is shown in **Figure 2**.

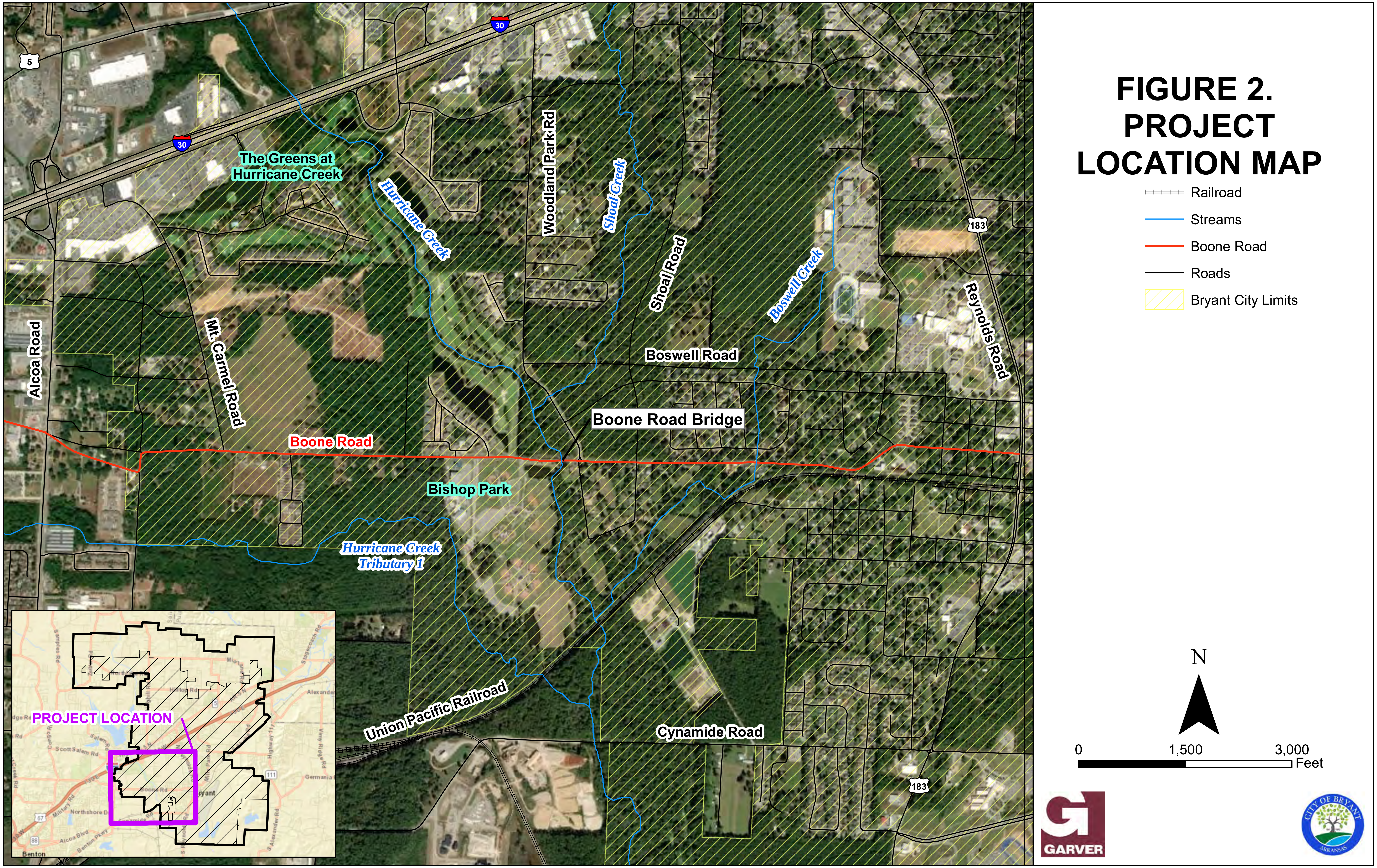
3.0 National Flood Insurance Program (NFIP) Data

The City of Bryant participates in the FEMA National Flood Insurance Program (NFIP). Current floodplain information and mapping is available in Flood Insurance Study (FIS) Report numbers 05125CV0001B and V0002B for Saline County, Arkansas, and Incorporated Areas. The City is mapped within Flood Insurance Rate Map (FIRM) Panels 0225E, 0240E, 0360E, 0370E, and 0380E. The project area of Boone Road at Hurricane Creek is within FIRM panel 0360E.

Hurricane Creek is mapped as Zone AE with floodway. The Effective floodplain mapping for the project area is shown in **Figure 3**.

Since Hurricane Creek is a Zone AE mapped floodplain, Effective hydrologic and hydraulic (H&H) studies were available. A FEMA data request was submitted, and Effective data was received from FEMA on March 23, 2022. In addition to hydrologic and hydraulic models, Technical Support Data Notebooks (TSDN) for the Effective hydrologic and hydraulic studies were received. The hydrology TSDN was dated March 31, 2014, and the hydraulic TSDN was dated November 11, 2014.

FIGURE 2. PROJECT LOCATION MAP



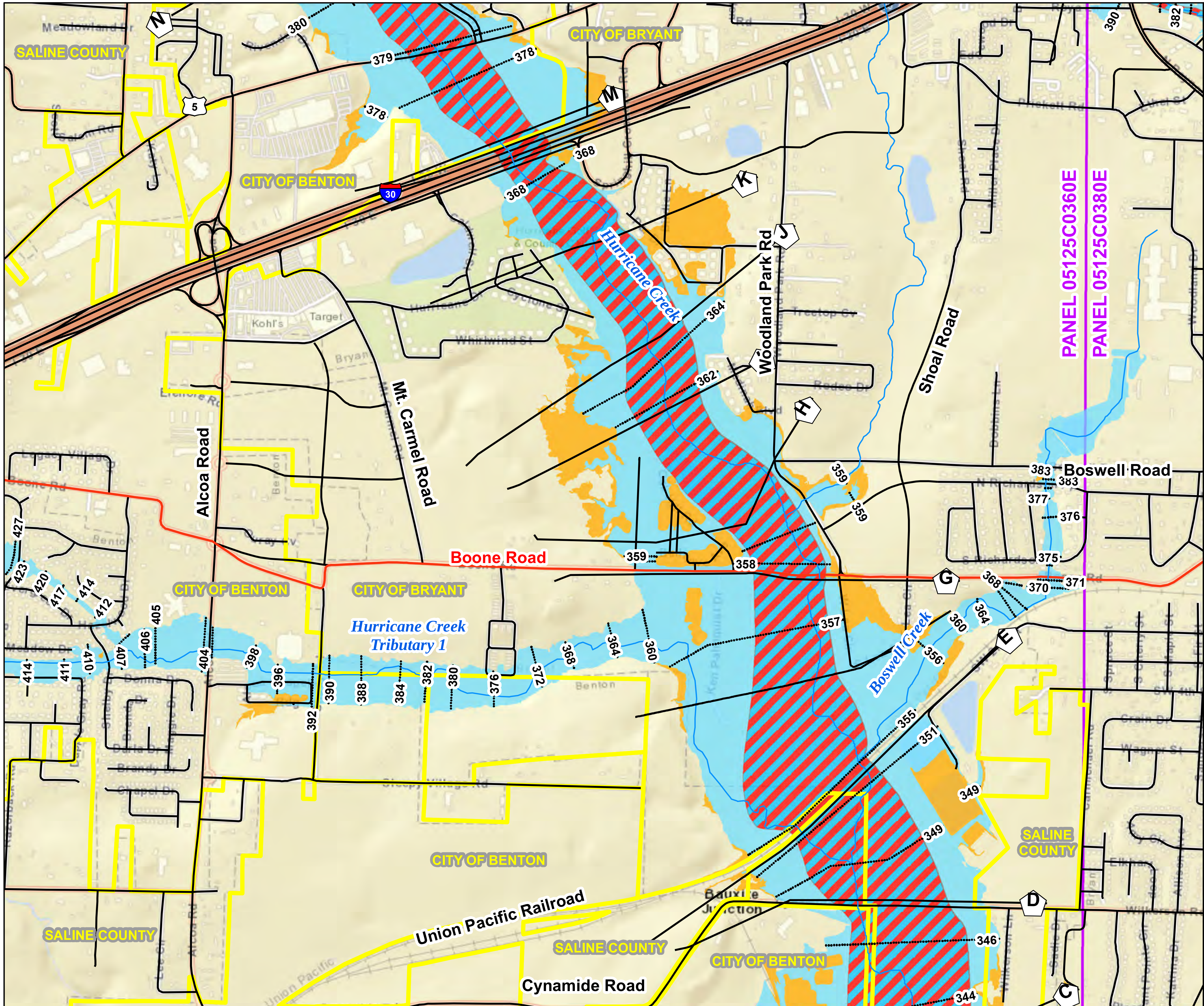


FIGURE 3. EFFECTIVE FLOODPLAIN MAP

- Lettered Section
- Effective Base Flood Elevation
- Streams
- Boone Road
- Roads
- Jurisdiction Boundaries
- Floodway
- 1% Annual Chance Event
- 0.2% Annual Chance Event
- FEMA FIRM Panel

Effective FEMA FIRM Panel boundaries and Floodplain boundaries were acquired from NFHL DIFRM Data for Saline County, dated June 5, 2020.

N

0 1,500 3,000 Feet

GARVER

4.0 Data Collection

4.1 Historical Records of Drainage and Flooding

4.1.1 City and Public News Records

The City has documented many past flood events along Boone Road, with at least six documented events occurring since 2011. These events involve overtopping of the roadway in the vicinity of the Hurricane Creek bridge and the culvert located just to the east of the bridge that drains the golf course pond. **Table 1** lists the documented events and the estimated rainfall amounts.

Table 1. Major Flood Events along Boone Road near Hurricane Creek

Date	Total Event Precipitation (in)
April 30-May 20, 2011	6.26*
November 20-22, 2011	7.02*
March 20-23, 2012	5.53*
November 28-30, 2015	6.22*
April 29-30, 2017	5.14*
February 19-24, 2018	8.44*
March 22, 2022	3.35*
January 22- 24, 2024	3.87**

**Total event precipitation from NOAA weather station at Adams Field at Little Rock National Airport.*

*** Total event precipitation from RJN rainfall monitoring site BRRG06 near Hurricane Creek*

Figure 4 displays the location of typical flooding along Boone Road near the pond relief culverts. **Figure 5** shows the flooding experienced within Bishop Park during a typical roadway-overtopping event.

4.1.2 Resident Comment Database

For this CDMP, a public comment period was issued to allow city residents to submit drainage issues. The comment period ran from April 10 to May 22, 2022. A total of 264 comments were received for the city planning area. Several comments were made within the area of Boone Road and Hurricane Creek; eight comments are within half a mile of the Boone Road bridge at Hurricane Creek. The known flood areas and resident comment locations are provided on **Figure 6**.

Figure 4. Boone Road near Hurricane Creek, looking west (November 28, 2015)

Figure 5. Bishop Park, looking north (February 23, 2018)

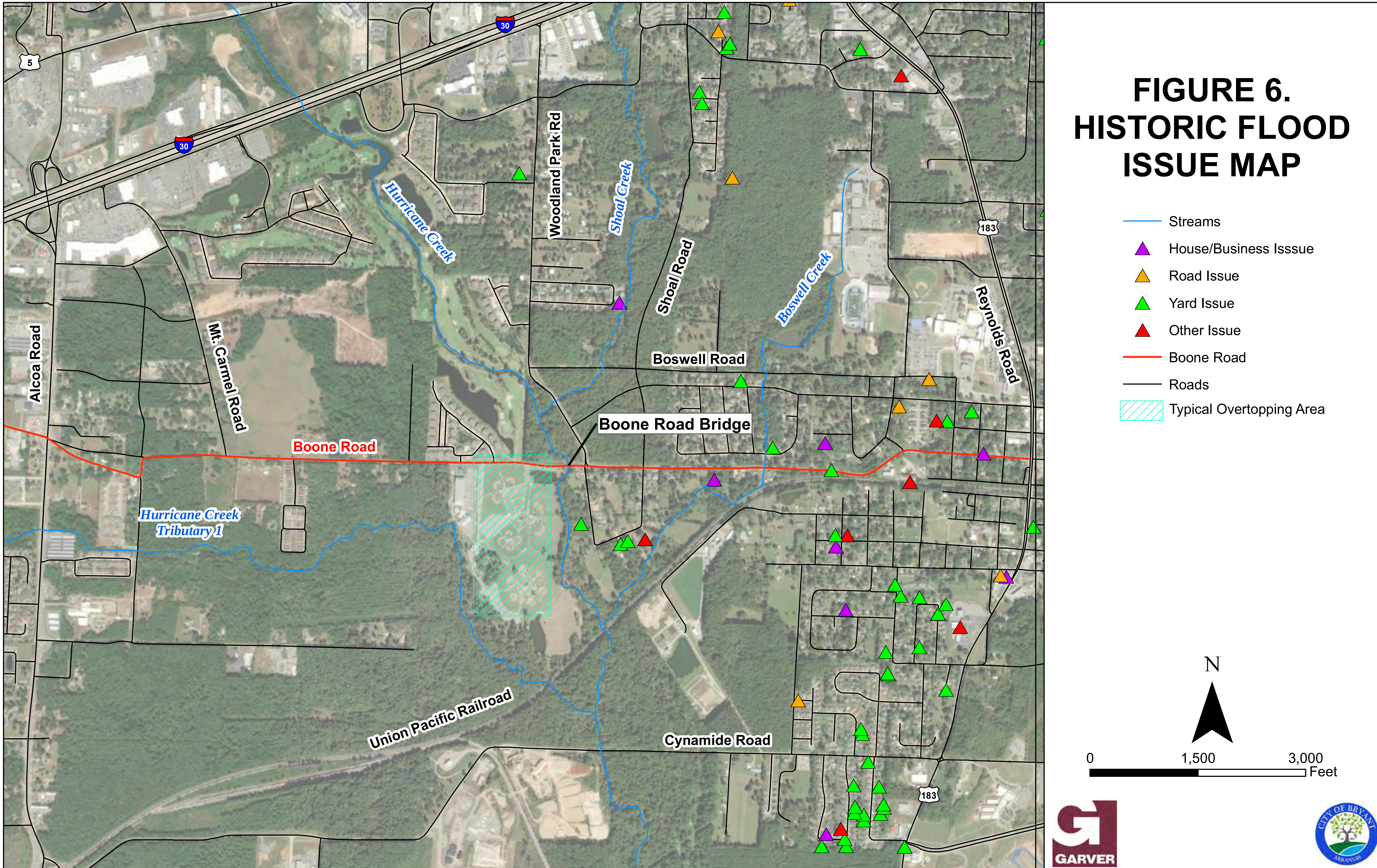


FIGURE 6.
HISTORIC FLOOD
ISSUE MAP
Streams
House/Business Isssue
Road Issue
Yard Issue
Other Issue
Boone Road
Roads
Typical Overtopping Area
N
0
1,500
3,000
Feet
Boone Road Bridge
Boone Road
Boswell Road
Cynamide Road
Union Pacific Railroad
Hurricane Creek
Hurricane Creek Tributary 1
Shoal Creek
Boswell Creek
Woodland Park Rd
Shoal Road
Mt. Carmel Road
Alcoa Road
Reynolds Road
30
5
183
GARVER
CITY OF BRYANT
ARKANSAS

4.2 GIS and Topographic Data

For this project, 1-meter Digital Elevation Model (DEM) lidar topography from USGS Ouachita study was acquired from the Arkansas GIS Office. Project survey throughout the project area was collected by Garnat to supplement the lidar data.

5.0 Initial Screening Study

During Phase 1, an Initial Screening Study was performed for the Hurricane Creek basin. For this screening, a hydraulic model was developed for the entire basin using 2D HEC-RAS and utilized rain-on-grid methodology to apply precipitation directly to the ground surface. This model was used to identify flood issues throughout the City, so is considered a qualitative model and not to be used for design. However, the data is useful in determining relative flood risk, and a flood severity index (FSI) was developed using the model results. Flood severity ranges from 0 to 4, with 4 being the most severe. The FSI classifications are listed in **Table 2**. **Table 3** displays the FSI rankings for Boone Road area.

Table 2. Flood Severity Index Classes

Class	Description	Maximum Flood Depth (ft)	Maximum Flood Velocity (ft/s)
FS0	Minimal severity	< 0.5	-
FS1	Unsafe for vehicles and pedestrians	< 1.5	< 6.0
FS2	Moderate flooding hazard for buildings	< 3	< 6.0
FS3	Potential for structural damage	> 3	< 6.0
FS4	Unsafe for vehicles and pedestrians; Potential for structural damage	> 0.5	>6.0

Table 3. Flood Severity Index For Hurricane Creek Model Area

Location	Stream Name	Basin	Potential Drainage Issue	Flood Severity Index			
				5 yr	10 yr	50 yr	100 yr
Boone Road	Hurricane Creek	Hurricane Creek	Roadway overtopping; home flooding	2	3	3	3

Because of the high likelihood of flooding at multiple storm events, and historical flood issues in the area, Boone Road was selected for further hydraulic study in order to identify conceptual drainage improvements.

6.0 Hydrology

In Phase 1 of the CDMP, the Effective hydrologic model of the Hurricane Creek basin was updated using HEC-HMS 4.10. The determined flow rates are provided in **Table 4**. Delineated subbasins for Hurricane Creek are shown in **Figure 7**.

Table 4. Summary of Discharges for Hurricane Creek

Location along Stream	Drainage area (sq mi)	Flow Rate (cfs)						
		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
Hurricane Lake Outfall	24.88	4,820	6,921	8,684	11,697	14,076	16,593	22,633
Immediately upstream of Interstate 30	28.05	5,748	8,317	10,410	13,967	16,681	19,494	26,550
Immediately upstream of Boone Road	30.88	5,682	8,343	10,567	13,995	16,773	19,762	27,051
Immediately upstream of Cynamide Road	34.55	5,881	8,642	10,926	14,724	17,687	20,812	28,511
Immediately upstream of State Highway 183	36.83	5,698	8,455	10,827	14,825	17,951	21,256	29,353

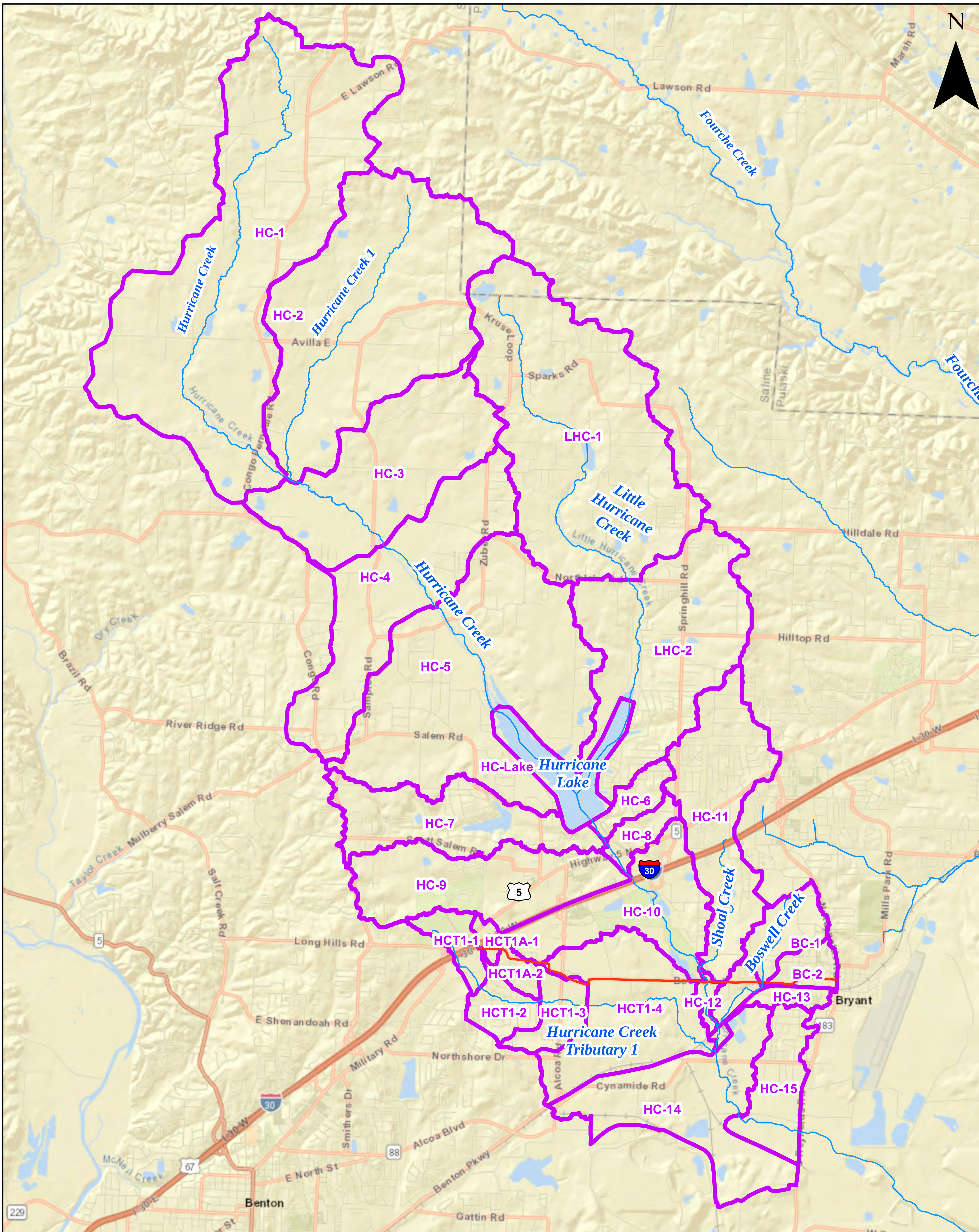


FIGURE 7.
HYDROLOGY MAP

Streams Boone Road Subbasins

0 0.5 1
Miles

GARVER

7.0 Hydraulics

Two model scenarios were created, one using 1D analysis and the other using 2D analysis. For the 1D analysis, the Effective model received from FEMA was utilized and updated as needed. The hydraulic analysis was performed using HEC-RAS version 6.3.1. Additionally, in order to understand flow patterns throughout the project area, including the diversion of flow within the golf course and the general flow patterns of a potential development area near the intersection of Boone Road and Mt. Carmel Road, a 2D HEC-RAS model was also developed. These models are described in more detail in the following sections.

The 2-, 5-, 10-, 25-, 50-, 100-, and 500-year flows obtained from the updated HEC-HMS model discussed in Section 6.0 were utilized in both models.

7.1 2D HEC-RAS Model

Initially, a 2D HEC-RAS model was created and run to best understand the complex flow patterns of the floodplain in the vicinity of Boone Road as well as the potentially developing area at Mt. Carmel and Boone Roads.

7.1.1 Model Domain

To be comparable to FEMA data for this stream and to also allow for appropriate flow inputs, the model boundary was set from just downstream of I-30 to just downstream of the railroad. Lateral extents were set outside of the mapped floodplain, with tributaries modeled to points upstream enough from Hurricane Creek so that the flow inputs for these creeks did not have a direct effect on Hurricane Creek results.

7.1.2 2D Mesh Development

The mesh was structured so that the elements are larger in the fringes of the floodplain and in higher elevations that are less likely to be inundated during the model simulations. The element density is generally the greatest at the bridge openings, roadway embankments, and major streams. A finer mesh (more nodes and elements) will lead to longer model runtimes, so the mesh was developed to produce acceptable results but minimize excessive runtimes. The mesh contains 11,153 cells with a maximum cell size of 25,927 square feet and a minimum cell size of 98 square feet.

The main channel of Hurricane Creek was represented with rectangular adaptive elements. Likewise, roadway embankments are generally represented by quadrilateral elements. The remainder of the mesh is composed of square non-adaptive elements. Breaklines were drawn along the thalweg of smaller channels to ensure that the channels were represented in the mesh. Breaklines were also used to define significant breaks in topography and to adjust the mesh density.

7.1.3 2D Model Terrain

The terrain data for the 2D model was built from 1-meter (DEM) lidar topography discussed in **Section 4.2**.

7.1.4 2D Model Boundary Conditions

The 2D hydrology was set up with multiple inflow locations. Inflow hydrographs were set at the inflow locations for Hurricane Creek from the north, Shoal Creek from the northeast, Boswell Creek from the east, and Hurricane Creek Tributary 1 from the west. Inflow hydrographs were taken from the updated Effective HEC-HMS model for the Hurricane Creek basin performed in Phase 1 of the CDMP.

As the inflow hydrographs were set to only include flow for areas outside of the model boundaries, the additional runoff within the model boundary was represented utilizing the rain-on-mesh feature in 2D HEC-RAS. This allows for precipitation to be represented in a hyetograph, with the 2D model determining runoff for a specific storm event. It also allows for non-fluvial areas within the model to be analyzed, with low lying areas that pond to be mapped. Additional inputs required for this methodology include land cover and soil information. The downstream channel boundary was set to normal depth slope of 0.002 ft/ft, and the overbank boundary conditions were set to normal depth slope of 0.001 ft/ft.

The model domain, mesh, and boundary locations are all shown in **Figure 8.**

7.1.5 2D Model Roughness Coefficients

The land use types, and their corresponding Manning's *n* roughness coefficients are listed in Table 3-5.

Table 5. Land Use Types and Roughness Coefficients

Land Use Type	Manning's *n* Value
Barren Land	0.06
Deciduous Forest	0.1
Developed Open Space	0.0404
Developed Low Density	0.0678
Developed Medium Density	0.0678
Developed High Density	0.0404
Grassland	0.0368
Open Water	0.001
Parking Lot	0.016
Road	0.02

7.1.6 2D Model Structures

Existing Conditions parameters for the Boone Road bridge are given in Table 6.

Table 6. Existing Boone Road Bridge Structure

Parameter	Value
Culvert Size & Type	3-10'x3' RCB
Upstream Invert Elevation	353.51 ft NAVD88
Downstream Invert Elevation	353.01 ft NAVD88
Box Length	45 ft
Minimum Top of Road within Floodplain	357.04 ft NAVD88
Open Flow Area	90 sq. ft

7.1.7 2D Existing Conditions Results

The 100-year water depth results are shown in Figure 8. The results of the 2D Existing Conditions model were reviewed to determine the existing flow patterns of the area. The results provided information regarding flow patterns in the model area. Of particular interest are the flow patterns in the area near Mt. Carmel Road and Boone Road. Several parcels of land near this intersection have been planned for development of a subdivision (Magnolia Development Phase 1 and Phase 2). Because of the nearby floodplain and known flood issue along Boone Road, the City requested that Garver determine the flow patterns within this area. The flow patterns are shown in Figure 9.

While the flow patterns were reviewed in the 2D model and utilized to develop preliminary design plans to improve flooding at Boone Road, the model itself was not utilized for the purposes of determining a no-rise design. The 1D no-rise analysis will be discussed in the following section.

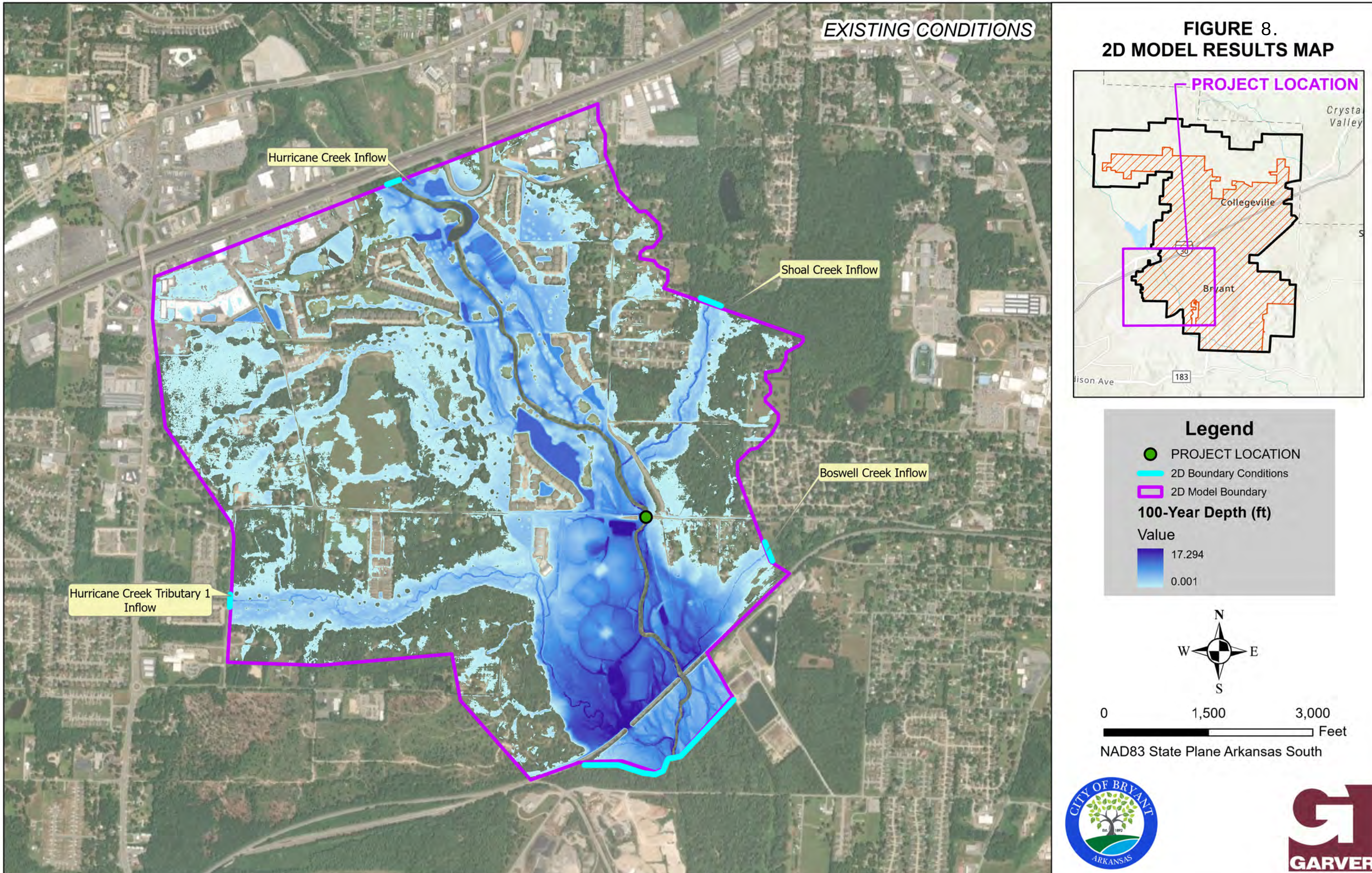
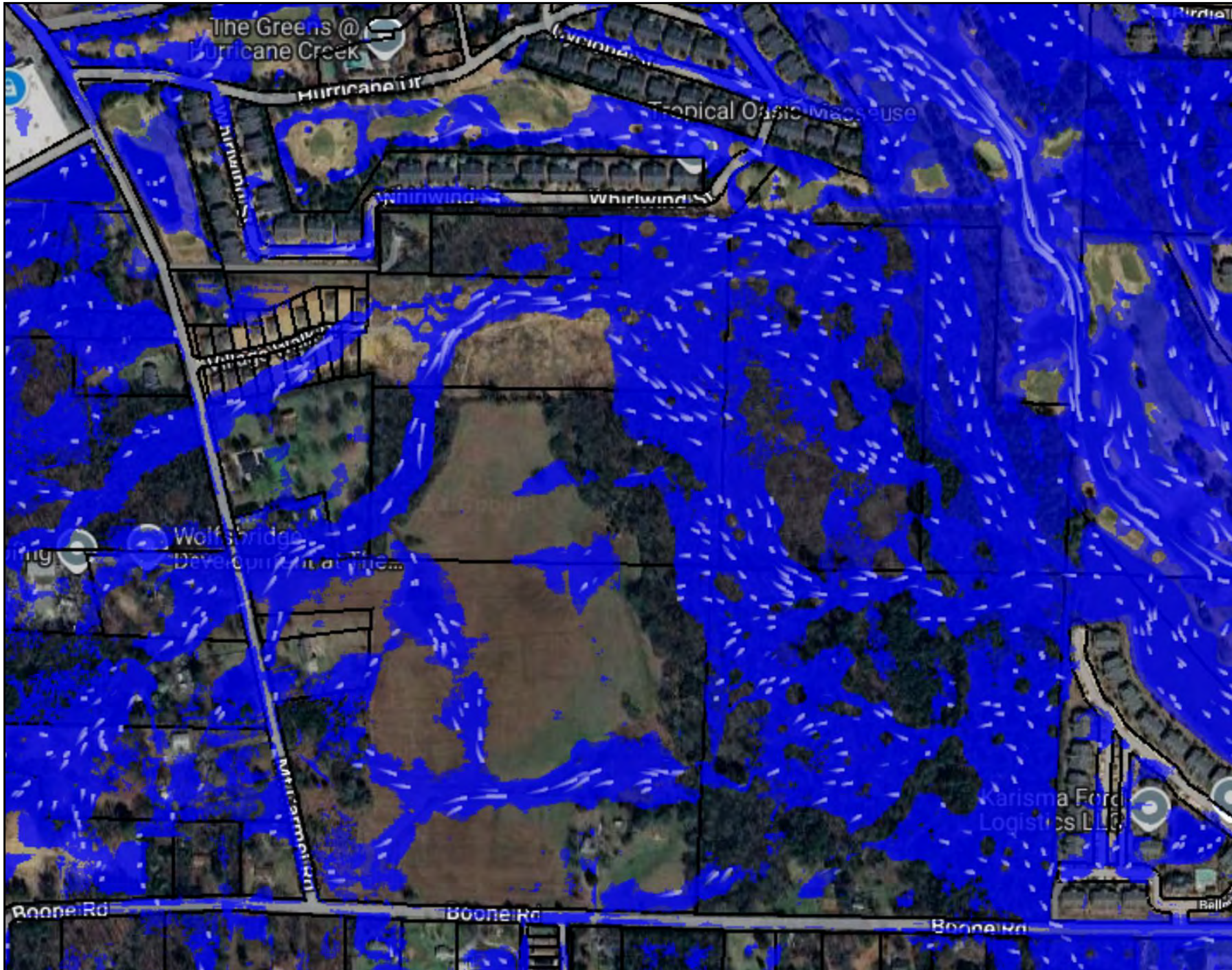
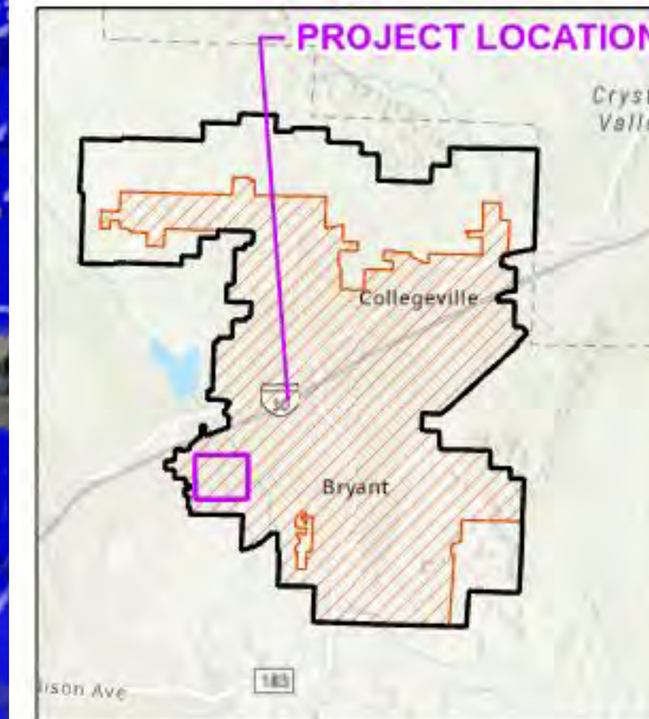

EXISTING CONDITIONS
FIGURE 8.
2D MODEL RESULTS MAP
PROJECT LOCATION
Crystal Valley
Collegeville
Bryant
183
Hurricane Creek Inflow
Shoal Creek Inflow
Boswell Creek Inflow
Hurricane Creek Tributary 1 Inflow
Legend
PROJECT LOCATION
2D Boundary Conditions
2D Model Boundary
100-Year Depth (ft)
Value
17.294
0.001
N
W
E
S
0
1,500
3,000
Feet
NAD83 State Plane Arkansas South
CITY OF BRYANT
ARKANSAS
GARVER

FIGURE 9.
2D MODEL FLOW PATTERN MAP





N
W
E
S

0 300 600
Feet

NAD83 State Plane Arkansas South

7.2 1D HEC-RAS Model

Because a no rise design is inherently difficult to model in a 2D model, a 1D model of the stream was created. As discussed in Section 3.0, a data request was made to FEMA for all Effective hydraulic models along Hurricane Creek. Garver received a HEC-RAS model of the creek from approximately 2,300 feet downstream of Zuber Road to Highway 183 (Reynolds Road). The received model was created in HEC-RAS v4.1, and the accompanying Technical Support Data Notebook (TSDN) was dated November 11, 2014.

7.2.1 Duplicate Effective Model

The received Effective model was brought into HEC-RAS v6.3.1 and run as the Duplicate Effective Model (full DEM). After running the full model, it was trimmed to Lettered Section M, which is located just upstream of the I-30 westbound service road. The trimmed Duplicate Effective Model (DEM) was compared to the full DEM to show that trimming of the model did not significantly affect results. The comparison showed that a few profiles were changed by 0.01 ft at a few cross sections. This change is considered acceptable, so the trimmed DEM was utilized for future comparisons.

7.2.2 Corrected Effective/Existing Conditions Model

The Effective FEMA model was utilized and updated in order to represent the current conditions of the project area, and the updated flowrates calculated for the project. Several cross sections were also reoriented to be more normal to the overall floodplain. Additionally, parameters such as reach lengths, ineffective area settings, and bank stations were updated were necessary. This Corrected Effective Model (CEM) was then run and compared to the DEM. Survey data was also collected for this project. Where available, channel or structure information was updated to reflect project survey. Where not available, structure information reflects input in the Effective model. **Table 7** provides a comparison of the Trimmed DEM and CEM models. Results show differences of up to 0.57 ft between the two models; however, the average difference is 0.05 ft. These differences can be attributed to adjustments to the geometry as well as the change in flow rates.

Table 7. 100-Year DEM and CEM Results along Hurricane Creek

DEM River Station	FEMA Lettered Section	DEM 100-YR WSEL (ft NAVD88)	CEM River Station	CEM 100-YR WSEL(ft NAVD88)	Difference (ft)
344367	-	378.25	344367	378.18	-0.07
344270	I-30 W Service Road				
344244		375.27	344244	375.22	-0.05
344231		375.26	344231	375.21	-0.05
344160	I-30 E&W Main Lanes				
344073		374.21	344073	374.19	-0.02
344064		373.47	344064	373.47	0.00
344047	I-30 E Service Road				
343984	L	368.54	343984	368.5	-0.04
343895	-	368.3	343895	368.29	-0.01
343514	-	367.79	343514	367.77	-0.02
343367	-	367.6	343367	367.63	0.03
343359	Golf Course Cart Path Bridge				
343342	-	367.49	343342	367.52	0.03
343197	-	367.48	343197	367.52	0.04
342824	-	367.33	342824	367.22	-0.11
342252	-	367.3	342252	367.22	-0.08
342167	-	367.02	342167	366.91	-0.11
342139	Golf Course Pond Dam				
342132	K	366.86	342132	366.81	-0.05
342124	Golf Course Cart Path Bridge				
342111	-	366.83	342111	366.77	-0.06
341986	-	366.87	341986	366.81	-0.06
341045	-	365.03	341045	364.86	-0.17
340646	J	364.89	340646	364.78	-0.11
340508	-	364.87	340508	364.77	-0.10
340500	Golf Course Cart Path Bridge				
340493	-	364.46	340493	364.46	0.00
340327	-	363.05	340327	363.01	-0.04
339747	I	361.62	339747	361.05	-0.57
339035	-	361.42	339023	360.6	-

DEM River Station	FEMA Lettered Section	DEM 100-YR WSEL (ft NAVD88)	CEM River Station	CEM 100-YR WSEL(ft NAVD88)	Difference (ft)
338264	-	361.21	338266	360.27	-
338109	H	361.16	338110	360.01	-
338106	Golf Course Cart Path Bridge				
338085	-	360.07	338082	359.81	-
337980	-	359.86	337989	359.42	-
337402	-	359.27	337411	358.55	-
336798	-	357.98	337140	358.41	-
-	-	-	336872	358.28	-
336650	-	357.51	336696	358	-
336623	Boone Road				
336545	G	357.34	336529	357.15	-
336451	-	357.33	336409	357.13	-
-	-	-	336047	357.01	-
335843	-	356.96	335843	356.89	-0.07
335217	F	356.82	335217	356.77	-0.05
334476	-	356.72	334476	356.67	-0.05
334001	-	356.5	334001	356.43	-0.07
333871	-	355.32	333871	355.21	-0.11
333812	Railroad				
333713	E	351.51	333713	350.85	-0.66
332978	-	350.1	332978	349.95	-0.15
332497	-	349.07	332497	349	-0.07
332034	-	348.35	332034	348.38	0.03
331979	D	348.35	331979	348.32	-0.03
331922	Cynamide Road				
331852	-	346.69	331852	346.46	-0.23
331715	-	346.49	331715	346.22	-0.27
331172	-	345.53	331172	345.09	-0.44
330046	-	343.94	330046	343.79	-0.15
329418	C	343.09	329418	342.9	-0.19
328479	-	341.99	328479	342.03	0.04
327262	-	341.2	327262	341.47	0.27
326159	-	340.73	326159	341.02	0.29

DEM River Station	FEMA Lettered Section	DEM 100-YR WSEL (ft NAVD88)	CEM River Station	CEM 100-YR WSEL(ft NAVD88)	Difference (ft)
325403	B	340.45	325403	340.79	0.34
324913	-	340.22	324913	340.54	0.32
324645	-	339.79	324645	340.15	0.36
324531	Highway 183/Reynolds Road				
324427	A	338.8	324427	338.9	0.10
324233	-	338.84	324233	338.95	0.11
323990	-	338.72	323990	338.85	0.13

The results of the Corrected Effective Model show that Boone Road overtops considerably for all modeled storm events, with the 2-year event overtopping the roadway by approximately 1.5 feet. The model results are verified by the multiple known overtopping events of Boone Road.

Existing Conditions parameters for the Boone Road bridge are given in **Table 8**.

Table 8. Existing Boone Road Bridge Structure

Parameter	Value
Bridge Configuration	6 @ 31' (186 total feet)
Pier Type and Size	1'-4" square
Abutment Type	Vertical
Minimum Top of Road within Floodplain	353 ft NAVD88
Open Flow Area	1,327 sq. ft

7.3 Proposed Conditions

It is noted that while Boone Road overtops in all modeled events, the bridge crossing is not in pressure flow except for the 500-year event. This suggests that in order to prevent overtopping of the roadway, the road embankment should be raised throughout the floodplain. The most significant design constraint for this project is the requirement of no-rise to the 100-year WSEL, since Hurricane Creek is mapped as Zone AE with floodway. A map revision is not feasible in this location because of the multiple buildings within the floodplain in the immediate area of Boone Road, including the Lakes at Hurricane Creek apartment complex located on the north side of the roadway. Some of the apartment buildings are mapped within the Corrected Effective 100-year floodplain. FEMA requires that no rise occur at any structure, so a no rise condition must be met for this project.

Since the roadway should be raised to prevent overtopping, the bridge should also be lengthened to mitigate a rise in WSEL. 25-year design condition was utilized for the proposed design. Proposed Conditions parameters for the Boone Road bridge are given in Table 9.

Table 9. Proposed Boone Road Bridge Structure

Parameter	Value
Bridge Configuration	17 @ 60' (1,020 total feet)
Pier Type and Size	2' square
Abutment Type	Vertical
Minimum Top of Road within Floodplain	356.3 ft NAVD88
Open Flow Area	4,058 sq. ft

In addition to the proposed Boone Road Bridge, a relief culvert is proposed to the immediate west of the apartment complex. Modeling shows that some flow currently passes along the west side of the apartments and overtops Boone Road in that area, continuing south to the west of the Bishop Park complex. A Triple-10'x3' box culvert is proposed to carry flow under the road at this location, with a proposed channel to carry the flow southward. Proposed Conditions parameters are given in Table 10..

Table 10. Proposed Boone Road Relief Culvert Structure

Parameter	Value
Culvert Size and Type	3-10'x3' RCB
Upstream Invert Elevation	353.55 ft NAVD88
Downstream Invert Elevation	353.00 ft NAVD88
Open Flow Area	90 sq. ft

A comparison of existing and proposed water surface elevations during the 100-year event is given in **Table 11**.

Table 11. Comparison of Existing and Proposed WSELs for 100-year event

River Station	CEM WSEL (ft NAVD88)	Proposed WSEL (ft NAVD88)	Difference (ft)
344367	378.18	378.18	0.00
344270	I-30 W Service Road		
344244	375.22	375.22	0.00
344231	375.21	375.21	0.00
344160	I-30 E&W Main Lanes		
344073	374.19	374.19	0.00
344064	373.47	373.47	0.00
344047	I-30 E Service Road		
343984	368.5	368.5	0.00
343895	368.29	368.29	0.00
343514	367.77	367.77	0.00
343367	367.63	367.63	0.00
343359	Golf Course Cart Path Bridge		
343342	367.52	367.52	0.00
343197	367.52	367.52	0.00
342824	367.22	367.22	0.00
342252	367.22	367.23	0.01*
342167	366.91	366.91	0.00
342139	Golf Course Pond Dam		
342132	366.81	366.81	0.00
342124	Golf Course Cart Path Bridge		
342111	366.77	366.77	0.00
341986	366.81	366.81	0.00
341045	364.85	364.85	0.00
340646	364.78	364.78	0.00
340508	364.76	364.76	0.00
340500	Golf Course Cart Path Bridge		
340493	364.45	364.45	0.00
340327	363.02	363.04	0.02*
339747	361.02	361.01	-0.01
339023	360.56	360.53	-0.03
338266	360.22	360.18	-0.04

River Station	CEM WSEL (ft NAVD88)	Proposed WSEL (ft NAVD88)	Difference (ft)
338110	359.95	359.9	-0.05
338106	Golf Course Cart Path Bridge		
338082	359.74	359.7	-0.04
337989	359.29	359.19	-0.10
337411	358.16	358.17	0.01*
337140	357.94	357.87	-0.07
336872	357.77	357.72	-0.05
336696	357.34	357.29	-0.05
336623	Boone Road		
336529	357.15	357.15	0.00
336409	357.13	357.13	0.00
336047	357.01	357.01	0.00
335843	356.89	356.89	0.00
335217	356.77	356.77	0.00
334476	356.67	356.67	0.00
334001	356.43	356.43	0.00
333871	355.21	355.21	0.00
333812	Railroad		
333713	350.85	350.85	0.00
332978	349.95	349.95	0.00
332497	349	349	0.00
332034	348.38	348.38	0.00
331979	348.32	348.32	0.00
331922	Cynamide Road		
331852	346.46	346.46	0.00
331715	346.22	346.22	0.00
331172	345.09	345.09	0.00
330046	343.79	343.79	0.00
329418	342.9	342.9	0.00
328479	342.03	342.03	0.00
327262	341.47	341.47	0.00
326159	341.02	341.02	0.00
325403	340.79	340.79	0.00

River Station	CEM WSEL (ft NAVD88)	Proposed WSEL (ft NAVD88)	Difference (ft)
324913	340.54	340.54	0.00
324645	340.15	340.15	0.00
324531	Highway 183/Reynolds Road		
324427	338.9	338.9	0.00
324233	338.95	338.95	0.00
323990	338.85	338.85	0.00

* Currently the proposed model shows very slight rises at three cross sections; however, the bridge design is conceptual and multiple design aspects will change for preliminary and final design. Therefore it is anticipated that the proposed WSELs may change slightly over the course of detailed design, and final design parameters may need to be iterated to meet no rise conditions. The conceptual design is a best approximation in order to prepare cost estimates.

8.0 Conceptual Layout and Planning Level Opinion of Project Costs

A conceptual layout drawing and planning level opinion of project costs are provided in Appendix A-1. This layout is for graphical and planning purposes only and is not for construction.

Appendix A-1

Phase 2

Boone Road at Hurricane Creek Improvements

Conceptual Layout and

Planning Level Opinion of Project Costs

CITY OF BRYANT
BRYANT, ARKANSAS
HURRICANE CREEK
AT BOONE ROAD
CONCEPT LAYOUT
GARVER
Legend
RECONSTRUCTION EXTENTS
STRUCTURE REMOVAL
0
200
400
600
Feet
NAD83 State Plane Arkansas North
N
S
E
W
OAK HILL RD.
BOONE RD.
HURRICANE CREEK
WOODLAND PARK RD.
W. LEA CIR.
CONSTRUCT
TRPL. 10' X 3' X 36'
R.C. BOX CULVERT
CONSTRUCT 1020' BRIDGE
RAISE ELEVATION TO 359.7'

Planning Level Opinion of Project Costs Boone Road at Hurricane Creek Improvements				
Item Description	Unit	Quantity	Unit Cost	Total Cost
Roadway Construction	Mile	0.24	$ 7,395,833.33	$ 1,775,000.00
Hurricane Creek Bridge (30' x 1020')	S.F.	30600	$ 340.00	$ 10,404,000.00
Triple 10' x 3' Reinforced Concrete Box Culvert (36')	S.F.	1080	$ 185.00	$ 199,800.00
Driveway Pavement Repair	S.Y.	525	$ 140.00	$ 73,500.00
Asphalt Pavement Repair	S.Y.	538	$ 200.00	$ 107,600.00
Site Preparation (10%)	L.S.	1	$ 1,891,279.00	$ 1,891,279.00
Traffic Control (1%)	L.S.	1	$ 189,473.00	$ 189,473.00
Erosion Control (3%)	L.S.	1	$ 568,492.00	$ 568,492.00
Contingency (20%)	L.S.	1	$ 3,791,382.00	$ 3,791,382.00
Total Estimated Construction Cost				$ 19,000,526.00
Additional Associated Costs				
Utility Relocation (10%)	L.S.	1	$ 1,900,053.00	$ 1,900,053.00
Engineering and Survey Fee (18%)	L.S.	1	$ 3,420,095.00	$ 3,420,095.00
RW Acquisition and Easements (2%)	L.S.	1	$ 380,011.00	$ 380,011.00
Total Estimated Project Cost				$ 24,700,700.00

Appendix B

Phase 2

Boone Road at Boswell Creek Improvements

Comprehensive Drainage Master Plan

City of Bryant

Phase 2

Boone Road at Boswell Creek Improvements

Prepared by:

GARVER

4701 Northshore Drive
North Little Rock, Arkansas 72118

January 2025

Garver Project No.: 20T20090

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Appendices

Appendix B-1: Conceptual Layout and Planning Level Opinion of Project Costs

List of Figures

List of Tables

1.0 Overall Project Description

A Comprehensive Drainage Master Plan (CDMP) is being developed for the City of Bryant. The purpose of the City of Bryant CDMP is to:

- Evaluate the existing drainage conditions of the City and Extra-Territorial Jurisdiction (ETJ), also known as the planning area;
- Identify current and future drainage problems;
- Generate proposed solutions to identified problems;
- Develop a Capital Improvement Plan (CIP); and
- Provide tools for managing future development.

The CDMP project is being performed in two (2) phases. Phases 1 and 2 will be divided into major tasks, with subtasks listed as applicable below these major tasks. **Figure 1** shows a flow chart of the overall project process.

- Phase 1: Data Collection and Initial Drainage Study Screening
- Phase 2: Survey Collection, Hydrologic and Hydraulic Modeling, Identification of Drainage Problems, Alternative Development, and CIP Development

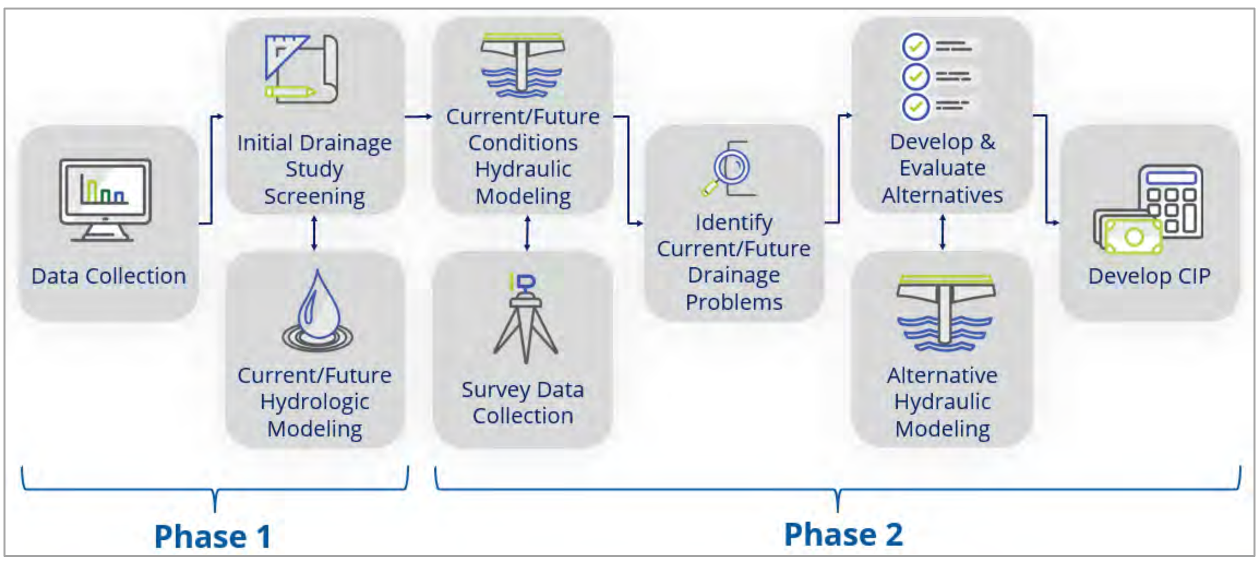


Figure 1. CDMP Project Process

This report discusses the processes and findings of a Phase 2 study for Boone Road at Boswell Creek.

2.0 General Information

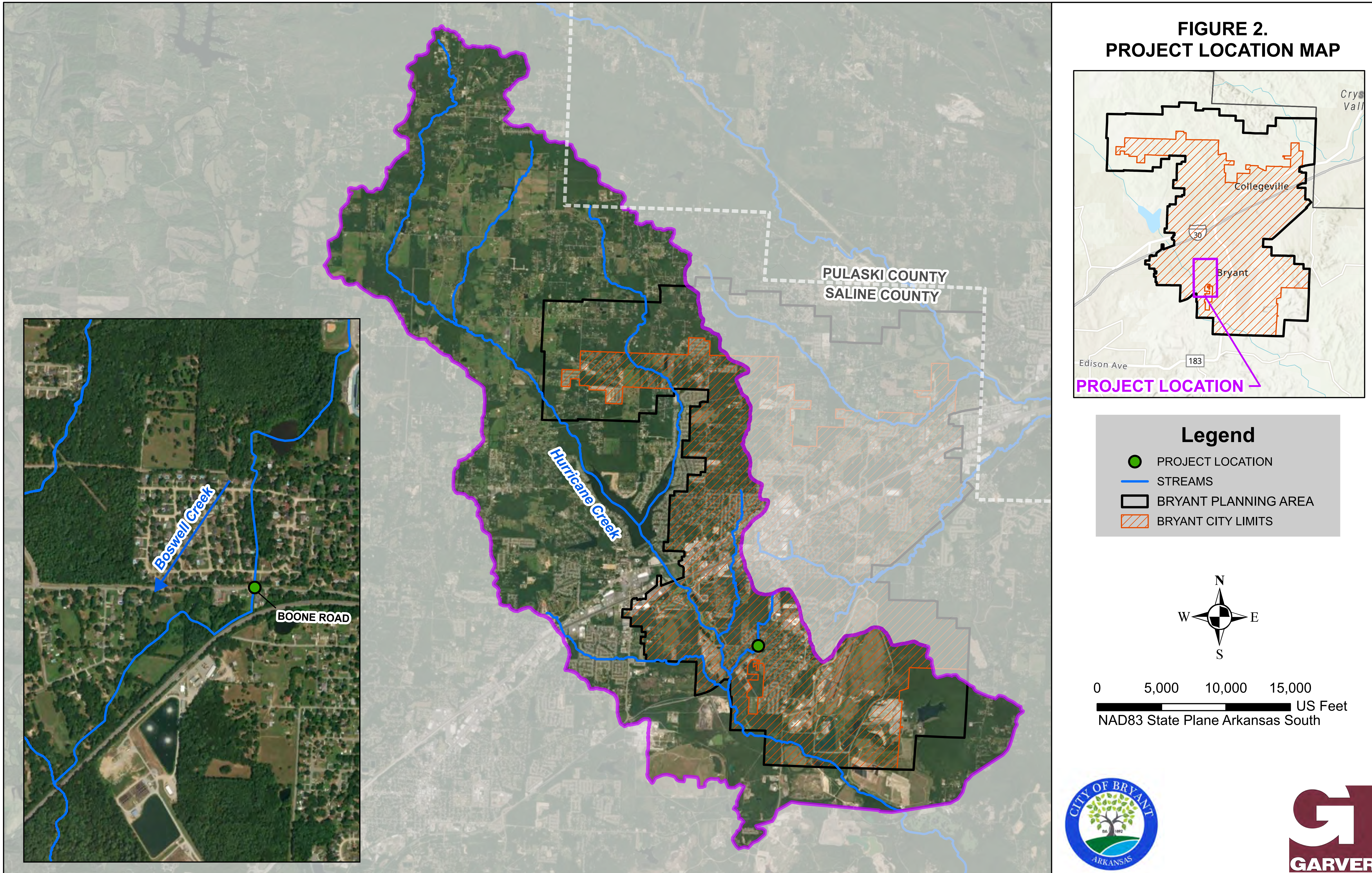
Boone Road is a minor arterial class roadway in the City of Bryant connecting Alcoa Road and Reynolds Road (Highway 183). The entirety of Boone Road is located in the Hurricane Creek Basin. Boswell Creek is a tributary to Hurricane Creek, with a culvert crossing under Boone Road approximately half a mile east of the intersection with Woodland Park Road. This crossing was identified in Phase 1 of the CDMP as a drainage problem. The project location map is shown in **Figure 2**.

3.0 National Flood Insurance Program (NFIP) Data

The City of Bryant participates in the FEMA National Flood Insurance Program (NFIP). Current floodplain information and mapping is available in Flood Insurance Study (FIS) Report numbers 05125CV0001B and V0002B for Saline County, Arkansas, and Incorporated Areas. The City is mapped within Flood Insurance Rate Map (FIRM) Panels 0225E, 0240E, 0360E, 0370E, and 0380E. The project area of Boone Road at Boswell Creek is within FIRM Panel 0360E.

Boswell Creek is mapped as Zone AE. The Effective floodplain mapping for the project area is shown in **Figure 3.**

FIGURE 2.
PROJECT LOCATION MAP



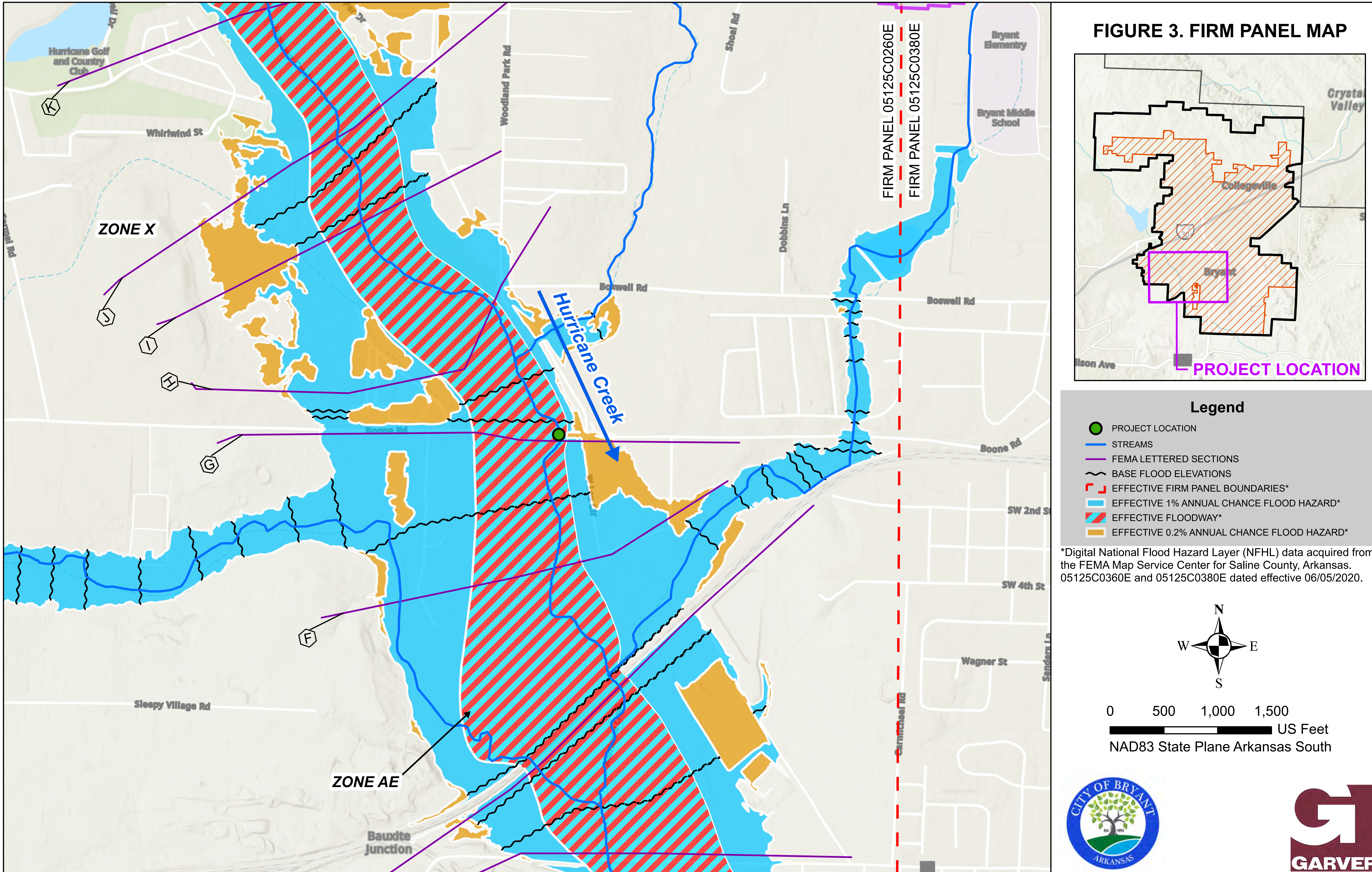


FIGURE 3. FIRM PANEL MAP

4.0 Data Collection

4.1 GIS and Topographic Data

For this project, 1-meter Digital Elevation Model (DEM) lidar topography from USGS Ouachita study was acquired from the Arkansas GIS Office. No survey data was collected for this location. Garver conducted a site visit to collect culvert sizes. Figures 4 and 5 show Boswell Creek in the area of Boone Road.

4.2 Resident Comment Database

For this CDMP, a public comment period was issued to allow city residents to submit drainage issues. The comment period ran from April 10 to May 22, 2022. A total of 264 comments were received for the city planning area. 119 comments were within the Hurricane Creek Drainage Basin. One comment was received for Boone Road within the project area for Boswell Creek. This comment referenced flow crossing over Boone Road every time it rains.

Figure 4. Upstream face of culverts at Boone Road

Figure 5. Looking downstream of Boone Road

5.0 Initial Screening Study

During Phase 1, an Initial Screening Study was performed for the Hurricane Creek basin. For this screening, a hydraulic model was developed for the entire basin using 2D HEC-RAS and utilized rain-on-grid methodology to apply precipitation directly to the ground surface. This model was used to identify flood issues throughout the City, so is considered a qualitative model and not to be used for design. However, the data is useful in determining relative flood risk, and a flood severity index (FSI) was developed using the model results. Flood severity ranges from 0 to 4, with 4 being the most severe. The FSI classifications are listed in **Table 1**. **Table 2** displays the FSI rankings for Boswell Creek.

Table 1. Flood Severity Index Classes

Class	Description	Maximum Flood Depth (ft)	Maximum Flood Velocity (ft/s)
FS0	Minimal severity	< 0.5	-
FS1	Unsafe for vehicles and pedestrians	< 1.5	< 6.0
FS2	Moderate flooding hazard for buildings	< 3	< 6.0
FS3	Potential for structural damage	> 3	< 6.0
FS4	Unsafe for vehicles and pedestrians; Potential for structural damage	> 0.5	>6.0

Because of the high likelihood of flooding at multiple storm events, and historical flood issues in the area, Boone Road at Boswell Creek was selected for further hydraulic study in order to identify conceptual drainage improvements.

Table 2. Flood Severity Index for Boone Road at Boswell Creek

Location	Stream Name	Basin	Potential Drainage Issue	Flood Severity Index			
				5 yr	10 yr	50 yr	100 yr
Boone Road	Boswell Creek	Hurricane Creek	Roadway overtopping; home flooding	1	1	2	2

6.0 Hydrology

In Phase 1 of the CDMP, an Effective hydrologic model of the Hurricane Creek basin was updated using HEC-HMS 4.10. Boswell Creek was included as a subbasin of Hurricane Creek. Calculated flow rates were compared to the Effective FIS flows. The Effective flows were slightly higher for published events. For this project, the Effective FIS flows were used for all storm events 10-year and greater; the HEC-HMS flows were utilized for the 2- and 5-year events, as these were not published in the FIS.

The determined flow rates for Boswell Creek are provided in Table 3.

Table 3. Summary of Discharges for Boswell Creek

Location along Stream	Drainage Area (sq mi)	Flow Rate (cfs)						
		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
Approx. 200 feet downstream of Boone Road	0.40	250	340	417	530	625	720	851
Just upstream of confluence with Hurricane Creek	0.77	439	595	729	942	1,116	1,289	1,522

7.0 Hydraulics

The hydraulic analysis was performed using HEC-RAS version 6.3.1. The Effective model received from FEMA was utilized and updated as needed.

The 2-, 5-, 10-, 25-, 50-, 100-, and 500-year flows discussed above were used in the model. The downstream boundary condition was set to a normal depth slope of 0.0056 ft/ft. The slope was determined based on the average slope of the thalweg in the downstream portion of the modeled reach.

7.1 Duplicate Effective Model

The received Effective model was brought into HEC-RAS v6.3.1 and run as the Duplicate Effective Model (DEM).

7.2 Corrected Effective Model

The Effective FEMA model was utilized and updated in order to represent the current conditions of the project area. Parameters such as reach lengths, ineffective area settings, and bank stations were updated were necessary. Existing conditions structure data for the Boone Road are given in **Table 4**.

Table 4. Existing Conditions Structure Data at Boone Road

Parameter	Value
Culvert Size & Type	3-2.5’ RCP
Upstream Invert Elevation	367.5
Downstream Invert Elevation	367.18
Box Length	31
Open Flow Area	14.73 sq. ft

In existing conditions, the structure overtops during all modeled flood events (2-year through 500-year).

7.3 Proposed Conditions

Based on the existing conditions results, drainage improvements were iterated to upsize these culverts as well as improve the flow capacity of the stream channel. After multiple iterations, a design was developed to convey the 10-year event storm without overtopping roadways. Boone Road is a minor arterial and should be able to pass a 50-

year event. However, there is no feasible solution for passing the 50-year event without significant redesign of Boone Road. As the current culvert will not pass the 2-year without overtopping, the 10-year design will significantly improve the drainage at this site. The proposed structure data is provided in **Table 5**.

Table 5. Proposed Structure Data at Boone Road

Parameter	Value
Culvert Size & Type	3-6'x3' RCB
Upstream Invert Elevation	367.5
Downstream Invert Elevation	367.18
Box Length	31
Open Flow Area	54 sq. ft

In addition to the upsized culvert under Boone Road, channel improvements were recommended. This would include a concrete trapezoidal channel with a 20ft channel bottom and 3:1 side slopes. Channelization is recommended from approximately 20 upstream of Boone Road to approximately 200 feet downstream. A comparison of the existing and proposed water surface elevations during the 50-year event is given in **Table 6,** as the 50-year event is the design event for a minor arterial. The model layout and floodplain boundaries are shown in **Figure 6**.

Table 6. Comparison of Existing and Proposed WSELs for 50-year event

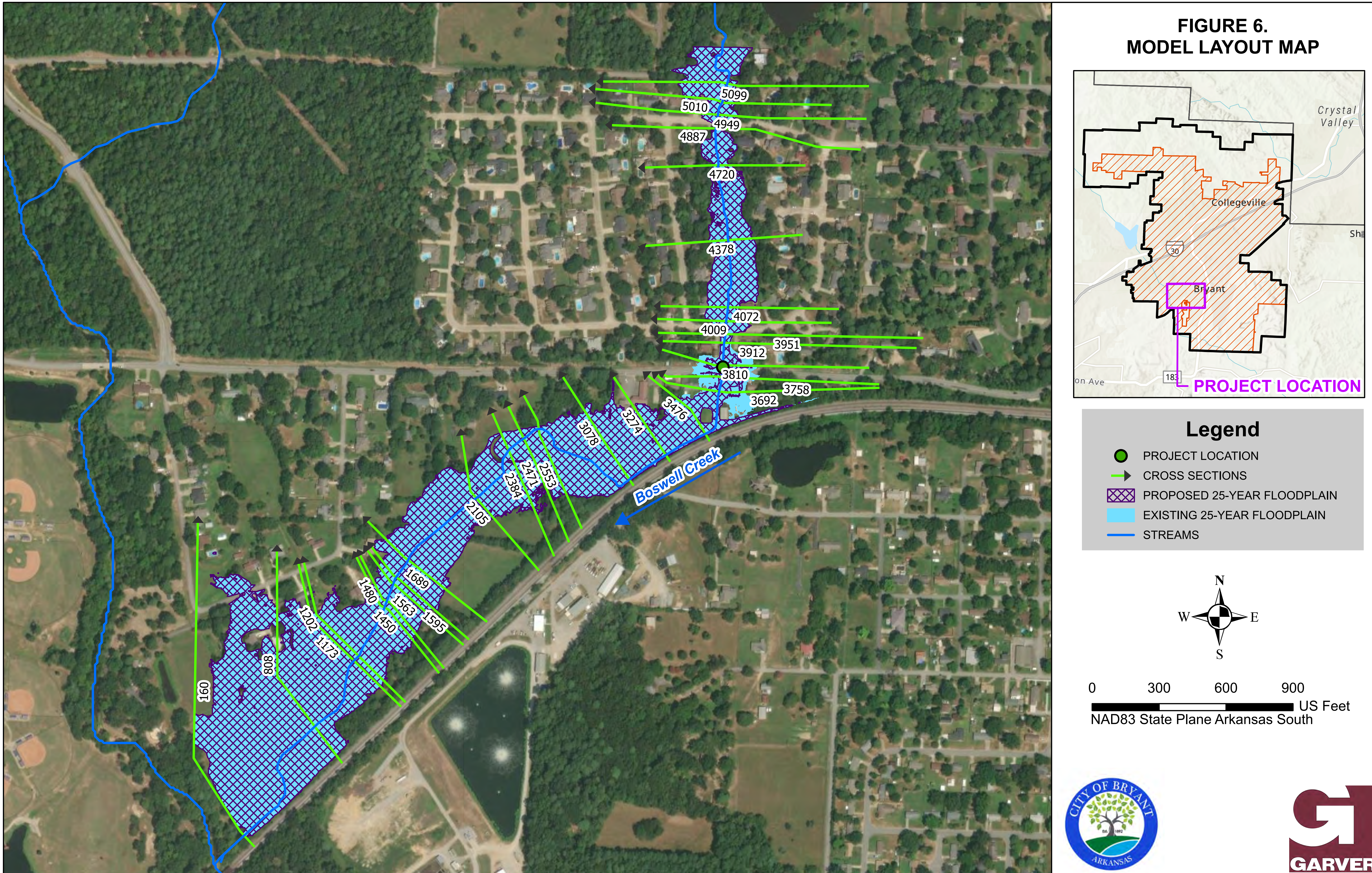
Model Cross Section	Existing Conditions WSEL (ft NAVD88)	Proposed Conditions WSEL (ft NAVD88)	Difference in WSEL (ft)
5335	383.10	383.43	0.33
5144	382.98	383.34	0.36
5122	Boswell Road		
5105	382.87	382.87	0.00
5010	382.81	382.81	0.00
4949	382.43	382.43	0.00
4926	N. Richardson Place		
4887	380.03	380.03	0.00
4720	376.97	376.97	0.00
4378	375.10	375.10	0.00
4072	374.46	374.46	0.00

Model Cross Section	Existing Conditions WSEL (ft NAVD88)	Proposed Conditions WSEL (ft NAVD88)	Difference in WSEL (ft)
4009	374.10	374.10	0.00
3984	S. Richardson Place		
3951	372.58	372.58	0.00
3912	371.76	371.41	-0.35
3810	371.46	370.68	-0.78
3788	Boone Road		
3758	370.69	370.11	-0.58
3692	369.91	369.37	-0.54
3564	N/A	369.39	N/A
3476	369.53	369.53	0.00
3274	368.03	368.03	0.00
3078	366.70	366.70	0.00
2553	363.83	363.83	0.00
2471	363.10	363.10	0.00
2384	362.72	362.72	0.00
2383	Inl Struct		
2105	359.91	359.91	0.00
1689	356.83	356.83	0.00
1595	356.36	356.36	0.00
1584	Pedestrian Bridge		
1563	355.77	355.77	0.00
1480	354.86	354.86	0.00
1464	Pedestrian Bridge		
1450	354.91	354.91	0.00
1202	352.97	352.97	0.00
1194	Pedestrian Bridge		
1173	352.47	352.47	0.00
808	351.23	351.23	0.00
160	349.27	349.27	0.00

8.0 Conceptual Layout and Planning Level Opinion of Project Costs

A conceptual layout drawing and planning level opinion of project costs are provided in Appendix B-1. This layout is for graphical and planning purposes only and is not for construction.

FIGURE 6.
MODEL LAYOUT MAP



Appendix B-1

Phase 2

Boone Road at Boswell Creek Improvements

Conceptual Layout and

Planning Level Opinion of Project Costs

CITY OF BRYANT
BRYANT, ARKANSAS
BOSWELL CREEK
AT BOONE ROAD
CONCEPT LAYOUT
GARVER
N
S
E
W
0
50
100
150
Feet
NAD83 State Plane Arkansas South
SOUTH RICHARDSON PL.
BOSWELL CREEK
BOONE RD.
CONSTRUCT
5 - 6' X 3' X 31'
R.C. BOX CULVERT
CONCRETE TRAPEZOIDAL CHANNEL
~20' BOTTOM WITH 3:1 SIDE SLOPES

Planning Level Opinion of Project Costs Boone Road at Boswell Creek Improvements				
Item Description	Unit	Quantity	Unit Cost	Total Cost
Unclassified Excavation	C.Y.	480	$ 30.00	$ 14,400.00
Aggregate Base Course (Class 7)	TON	34	$ 50.00	$ 1,700.00
Concrete Ditch Paving	S.Y.	920	$ 75.00	$ 69,000.00
Quintuple 6' x 3' Reinforced Concrete Box Culvert (31')	S.F.	930	$ 185.00	$ 172,050.00
Asphalt Pavement Repair	S.Y.	73	$ 200.00	$ 14,600.00
Site Preparation (10%)	L.S.	1	$ 40,175.00	$ 40,175.00
Traffic Control (1%)	L.S.	1	$ 4,046.00	$ 4,046.00
Erosion Control (3%)	L.S.	1	$ 12,145.00	$ 12,145.00
Contingency (20%)	L.S.	1	$ 81,088.00	$ 81,088.00
Total Estimated Construction Cost				$ 409,204.00
Additional Associated Costs				
Utility Relocation (10%)	L.S.	1	$ 40,920.00	$ 40,920.00
Engineering and Survey Fee (18%)	L.S.	1	$ 73,657.00	$ 73,657.00
RW Acquisition and Easements (2%)	L.S.	1	$ 8,184.00	$ 8,184.00
Total Estimated Project Cost				$ 532,000.00

Appendix C

Phase 2

Cynamide Road at Hurricane Creek Improvements

Comprehensive Drainage Master Plan

City of Bryant

Phase 2

Cynamide Road at Hurricane Creek Improvements

Prepared by:

GARVER

4701 Northshore Drive
North Little Rock, Arkansas 72118

January 2025

Garver Project No.: 20T20090

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Appendices

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1.0 Overall Project Description

A Comprehensive Drainage Master Plan (CDMP) is being developed for the City of Bryant. The purpose of the City of Bryant CDMP is to:

- Evaluate the existing drainage conditions of the City and Extra-Territorial Jurisdiction (ETJ), also known as the planning area;
- Identify current and future drainage problems;
- Generate proposed solutions to identified problems;
- Develop a Capital Improvement Plan (CIP); and
- Provide tools for managing future development.

The CDMP project is being performed in two (2) phases. Phases 1 and 2 will be divided into major tasks, with subtasks listed as applicable below these major tasks. **Figure 1** shows a flow chart of the overall project process.

- Phase 1: Data Collection and Initial Drainage Study Screening
- Phase 2: Survey Collection, Hydrologic and Hydraulic Modeling, Identification of Drainage Problems, Alternative Development, and CIP Development

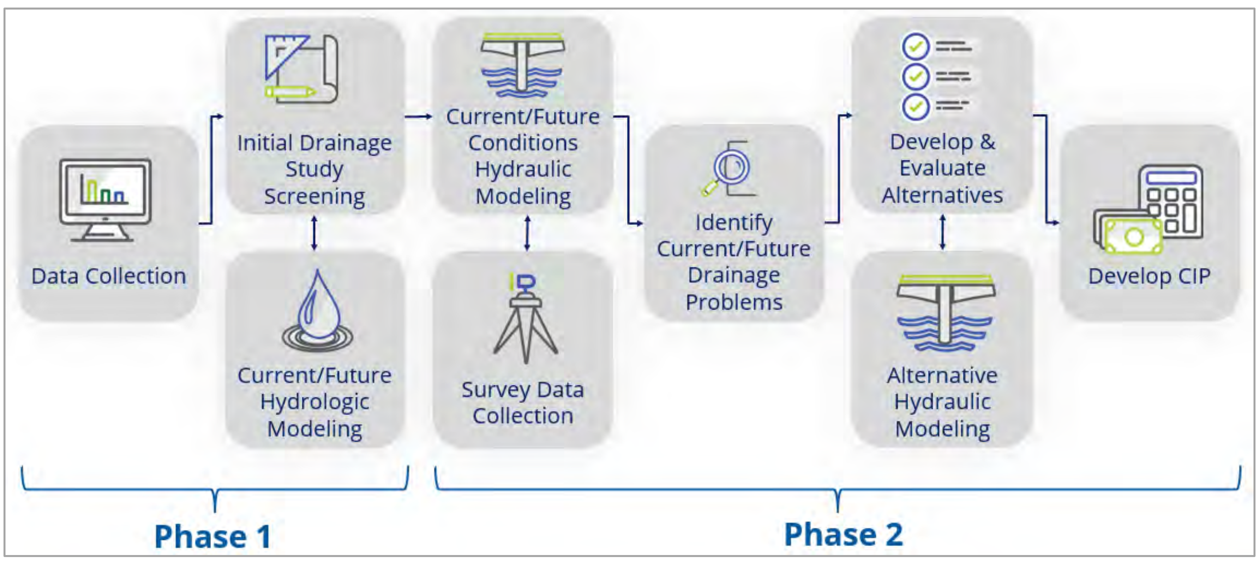


Figure 1. CDMP Project Process

This report discusses the processes and findings of a Phase 2 study for Cynamide Road at Hurricane Creek.

2.0 General Information

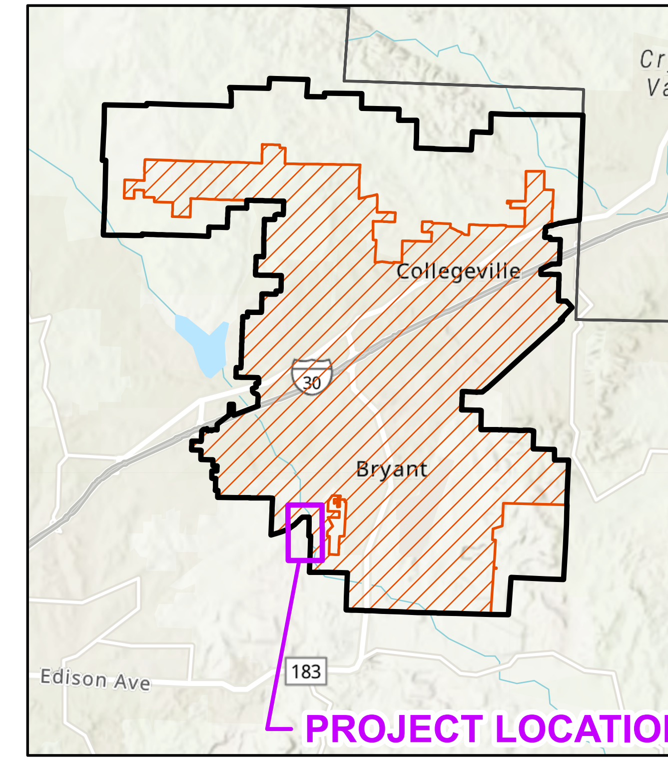
Cynamide Road is a minor arterial class roadway connecting Alcoa Boulevard to South Reynolds Road, with a box culvert crossing over Hurricane Creek. The project location map is shown in **Figure 2**.

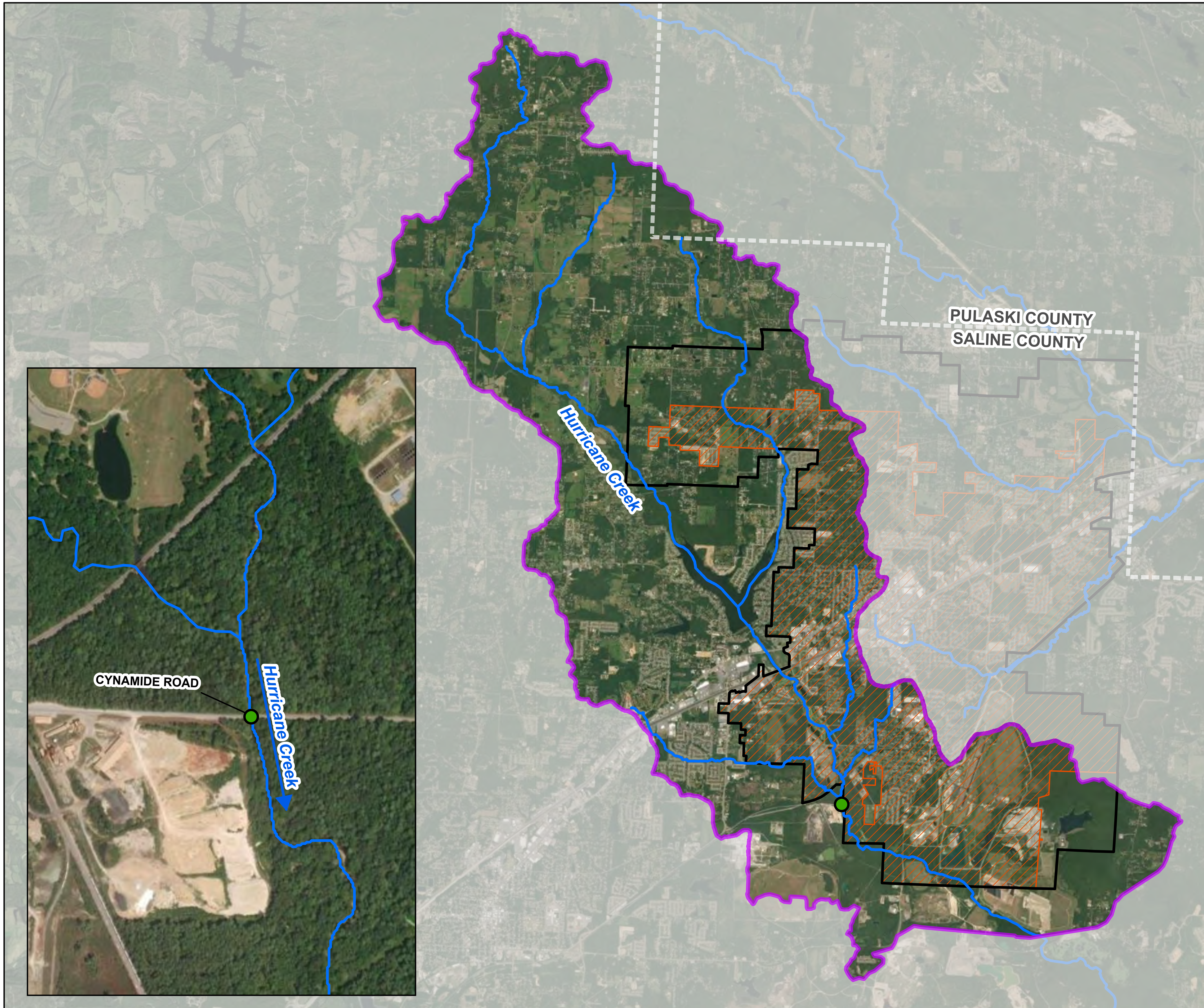
3.0 National Flood Insurance Program (NFIP) Data

The City of Bryant participates in the FEMA National Flood Insurance Program (NFIP). Current floodplain information and mapping is available in Flood Insurance Study (FIS) Report numbers 05125CV0001B and V0002B for Saline County, Arkansas, and Incorporated Areas. The City is mapped within Flood Insurance Rate Map (FIRM) Panels 0225E, 0240E, 0360E, 0370E, and 0380E. The Cynamide Road crossing is within Panel 0360E.

Hurricane Creek is mapped as Zone AE with floodway. The Effective floodplain mapping for the project area is shown in **Figure 3**.

FIGURE 2.
PROJECT LOCATION MAP





GARVER

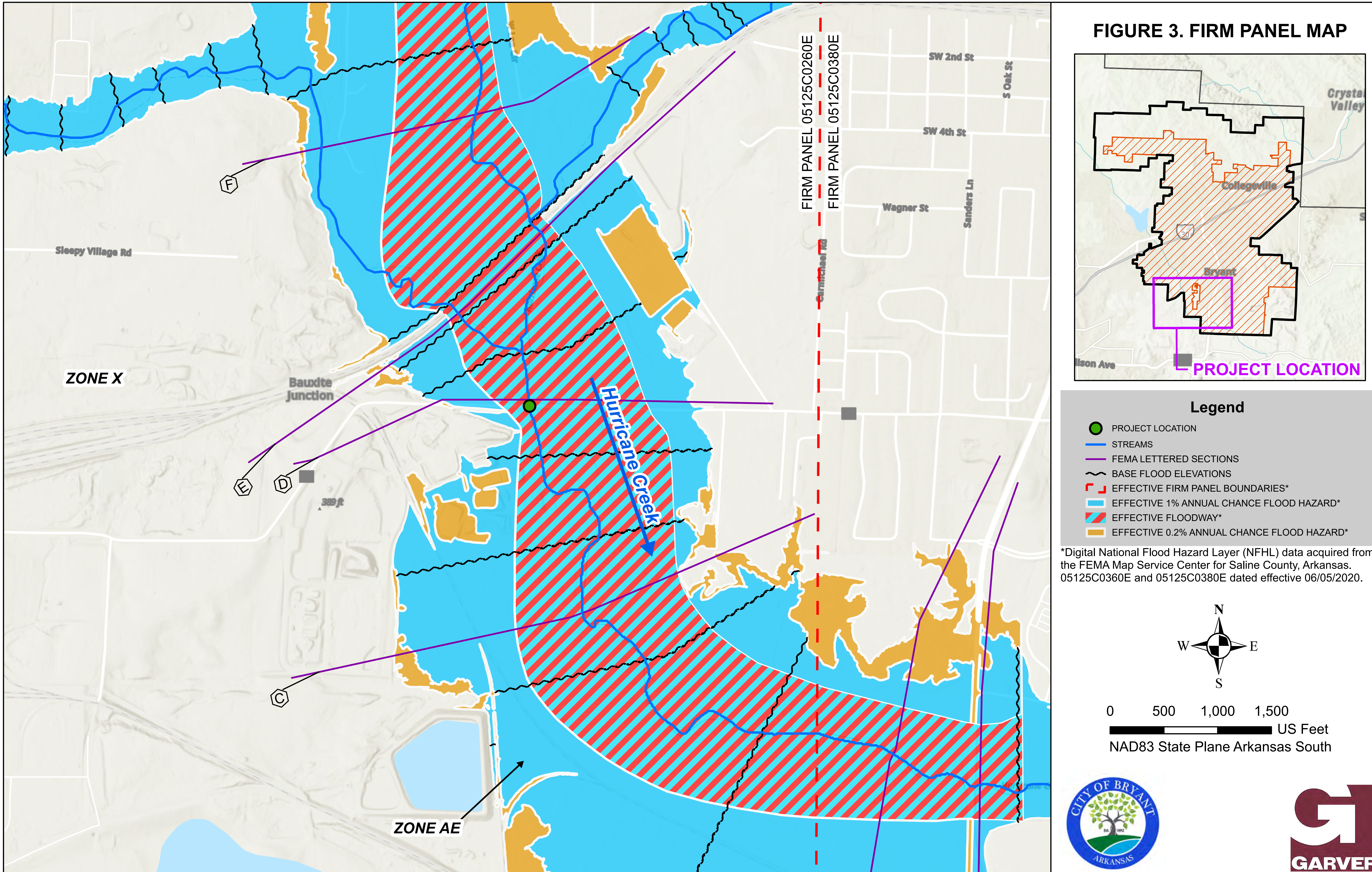


FIGURE 3. FIRM PANEL MAP
ZONE X
ZONE AE
Hurricane Creek
Sleepy Village Rd
Bauxite Junction
389 ft
FIRM PANEL 05125C0260E
FIRM PANEL 05125C0380E
SW 2nd St
SW 4th St
S Oak St
Wagner St
Sanders Ln
Carmichael Rd
F
E
D
C
Crystal Valley
Collegeville
Bryant
PROJECT LOCATION
Legend
PROJECT LOCATION
STREAMS
FEMA LETTERED SECTIONS
BASE FLOOD ELEVATIONS
EFFECTIVE FIRM PANEL BOUNDARIES*
EFFECTIVE 1% ANNUAL CHANCE FLOOD HAZARD*
EFFECTIVE FLOODWAY*
EFFECTIVE 0.2% ANNUAL CHANCE FLOOD HAZARD*
*Digital National Flood Hazard Layer (NFHL) data acquired from the FEMA Map Service Center for Saline County, Arkansas. 05125C0360E and 05125C0380E dated effective 06/05/2020.
N
W
E
S
0 500 1,000 1,500
US Feet
NAD83 State Plane Arkansas South
CITY OF BRYANT
ARKANSAS
GARVER

4.0 Data Collection

4.1 GIS and Topographic Data

For this project, 1-meter Digital Elevation Model (DEM) lidar topography from USGS Ouachita study was acquired from the Arkansas GIS Office. No survey was collected for this location. Structure data included in the Effective hydraulic model for Hurricane Creek was used. Garver conducted a site visit to the location to confirm structure information. The Cynamide Road crossing is shown in **Figure 4**.

Figure 4. Cynamide Road at Hurricane Creek

4.2 Resident Comment Database

For this CDMP, a public comment period was issued to allow city residents to submit drainage issues. The comment period ran from April 10 to May 22, 2022. A total of 264 comments were received for the city planning area. 119 comments were within the Hurricane Creek drainage Basin. Zero resident comments were made for Hurricane Creek near the project area for Cynamide Road.

5.0 Initial Screening Study

During Phase 1, an Initial Screening Study was performed for the Hurricane Creek Basin. For this screening, a hydraulic model was developed for the entire basin using 2D HEC-RAS and utilized rain-on-grid methodology to apply precipitation directly to the ground surface. This model was used to identify flood issues throughout the City, so is considered a qualitative model and not to be used for design. However, the data is useful in determining relative flood risk, and a flood severity index (FSI) was developed using the model results. Flood severity ranges from 0 to 4, with 4 being the most severe. The FSI classifications are listed in **Table 1**. **Table 2** displays the FSI rankings for Cynamide Road.

Table 1. Flood Severity Index Classes

Class	Description	Maximum Flood Depth (ft)	Maximum Flood Velocity (ft/s)
FS0	Minimal severity	< 0.5	-
FS1	Unsafe for vehicles and pedestrians	< 1.5	< 6.0
FS2	Moderate flooding hazard for buildings	< 3	< 6.0
FS3	Potential for structural damage	> 3	< 6.0
FS4	Unsafe for vehicles and pedestrians; Potential for structural damage	> 0.5	>6.0

Table 2. Flood Severity Index for Cynamide Road

Location	Stream Name	Basin	Potential Drainage Issue	Flood Severity Index			
				5 yr	10 yr	50 yr	100 yr
Cynamide Road	Hurricane Creek	Hurricane Creek	Roadway overtopping	0	2	2	3

Because of the high likelihood of flooding at multiple storm events, Cynamide Road was selected for further hydraulic study in order to identify conceptual drainage improvements.

6.0 Hydrology

In Phase 1 of the CDMP, a hydrologic model of the Hurricane Creek basin was created using HEC-HMS 4.10. Flows determined in the updated Garver model were compared to Effective flows used in the Effective hydraulic model, the updated flows were within 1.4% on average, with a maximum difference of 5.3%. Differences in values are considered acceptable. HEC-HMS flow rates were used in the design hydraulic model.

The determined flow rates are provided in **Table 3**.

Table 3. Summary of Discharges for Hurricane Creek

Location along Stream	Drainage Area (sq mi)	Flow Rate (cfs)						
		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
Upstream of I-30	28.05	5,748	8,317	10,410	13,967	16,681	19,494	26,550
Immediately upstream of Boone Rd	30.88	5,682	8,343	10,567	13,995	16,773	19,762	27,051
Immediately upstream of Cynamide Rd	34.55	5,881	8,642	10,926	14,724	17,687	20,812	28,511
Immediately upstream of Highway 183	36.83	5,698	8,455	10,827	14,825	17,951	21,256	29,353

7.0 Hydraulics

The hydraulic analysis was performed using HEC-RAS version 6.3.1. the Effective model received from FEMA was utilized and updated as needed.

The 2-, 5-, 10-, 25-, 50-, 100-, and 500-year flows obtained from the HEC-HMS model discussed above were used in the models. The downstream boundary condition was set to a normal depth slope of 0.00049 ft/ft. The slope was determined based on the average slope of the thalweg in the downstream portion of the modeled reach.

7.1 Duplicate Effective Model

The received Effective model was brought into HEC-RAS v6.3.1 and run as the Duplicate Effective Model (DEM).

7.2 Existing Conditions

The Effective FEMA model was utilized and updated in order to represent the current conditions of the project area. Parameters such as reach lengths, ineffective area settings, and bank stations were updated were necessary. Parameters for the existing structure at Cyanamide Road is given in **Table 4**.

Table 4. Existing Cynamide Road Structure Data (from Effective FIS Model)

Parameter	Value
Culvert Size	6- 10x8 RCB
Upstream Invert Elevation	336.84 ft NAVD88
Downstream Invert Elevation	336.82 ft NAVD88
Culvert Length	36 feet
Minimum Top of Road within Floodplain	346.23 ft NAVD88
Open Flow Area	480 sq. ft

In existing conditions, the structure overtops during all modeled flood events (2-year through 500-year).

7.3 Proposed Conditions

Based on the existing conditions results, drainage improvements were iterated to increase the open flow area by replacing the existing culvert structure with a bridge.

After multiple iterations, a design was developed to convey the 25-year event storm without overtopping the roadway. Parameters for the proposed bridge updates are provided in **Table 5**.

Table 5. Proposed Cynamide Road Structure Data

Parameter	Value
Bridge Configuration	700 foot bridge (spans TBD)
Pier Type and Size	To be determined
Abutment Type	To be determined
Minimum Top of Road within Floodplain	347.3 ft NAVD88
Open Flow Area	2,583 sq. ft

A comparison of existing and proposed water surface elevations during the 25-year event is given in **Table 6**. The existing and proposed floodplain boundaries are shown in **Figure 7**.

Table 6. Comparison of Existing and Proposed WSELs for 25-year event

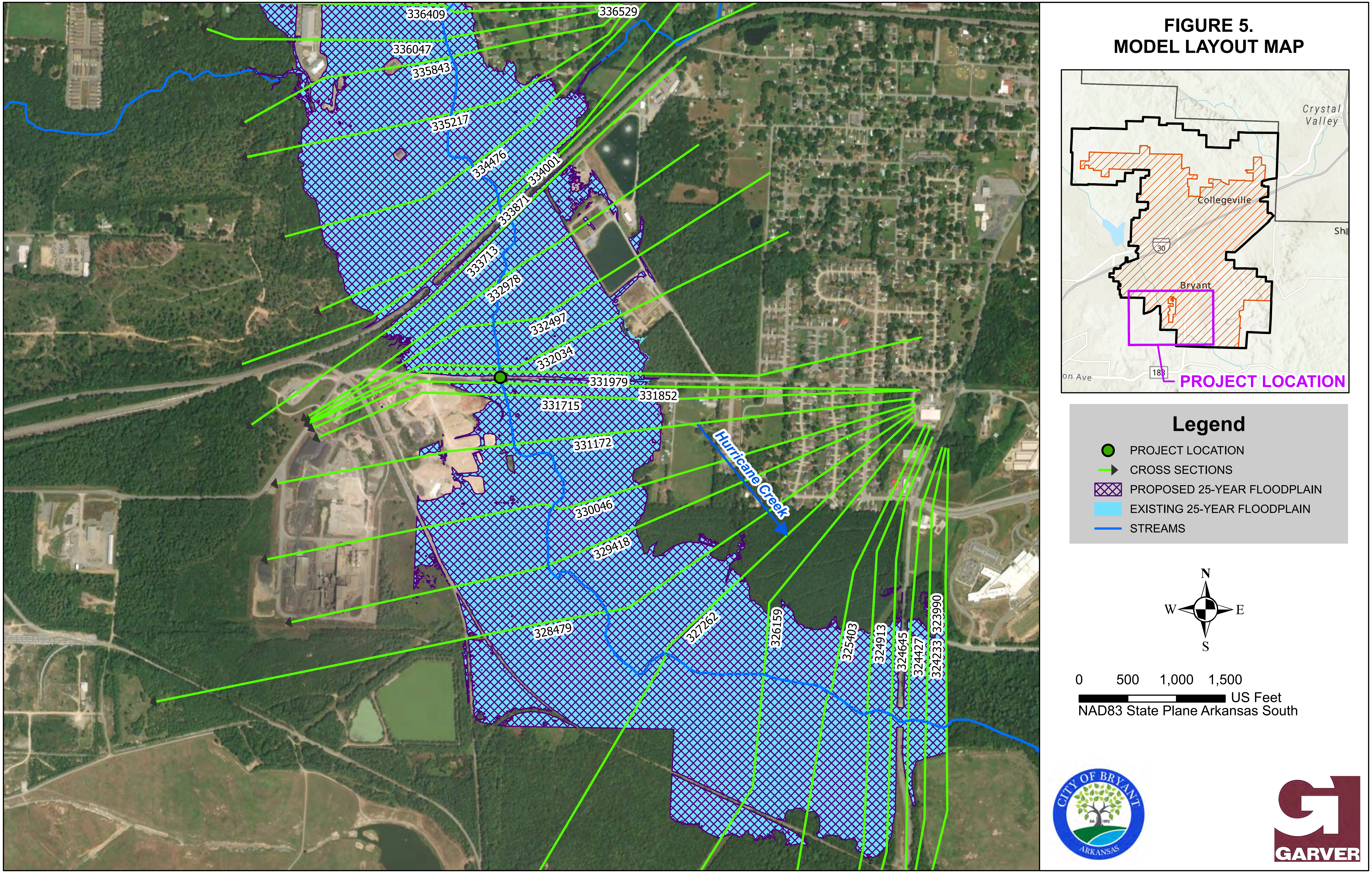
Model Cross Section	Existing Conditions WSEL (ft NAVD88)	Proposed Conditions WSEL (ft NAVD88)	Difference in WSEL (ft)
333871	355.21	355.21	0.00
333812	Bridge		
333713	351.04	350.97	-0.07
332978	350.01	349.86	-0.15
332497	349.13	348.72	-0.41
332034	348.62	347.98	-0.64
331979	348.34	347.64	-0.70
331922	Cynamide Road		
331852	346.33	346.32	-0.01
331715	346.07	346.06	-0.01
331172	345.06	345.06	0.00
330046	343.77	343.77	0.00
329418	342.95	342.95	0.00
328479	342.25	342.25	0.00
327262	341.55	341.55	0.00
326159	341	341	0.00

Model Cross Section	Existing Conditions WSEL (ft NAVD88)	Proposed Conditions WSEL (ft NAVD88)	Difference in WSEL (ft)
325403	340.79	340.79	0.00
324913	340.54	340.54	0.00
324645	340.15	340.15	0.00
324531		Bridge	
324427	338.9	338.9	0.00
324233	338.95	338.95	0.00
323990	338.85	338.85	0.00

8.0 Conceptual Layout and Planning Level Opinion of Project Costs

A conceptual layout drawing and planning level opinion of project costs are provided in Appendix C-1. This layout is for graphical and planning purposes only and is not for construction.

FIGURE 5.
MODEL LAYOUT MAP



Appendix C-1

Phase 2

Cynamide Road at Hurricane Creek Improvements

Conceptual Layout and

Planning Level Opinion of Project Costs

N
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Feet
NAD83 State Plane Arkansas South
CITY OF BRYANT
BRYANT, ARKANSAS
HURRICANE CREEK
AT CYNAMIDE ROAD
CONCEPT LAYOUT
GARVER
Legend
RECONSTRUCTION EXTENTS
CYNAMIDE RD.
CONSTRUCT 700' BRIDGE
RAISE ROADWAY
ELEVATION TO 346'
~ 2225 LF
HURRICANE CREEK

Planning Level Opinion of Project Costs Cynamide Road at Hurricane Creek Improvements				
Item Description	Unit	Quantity	Unit Cost	Total Cost
Roadway Construction	Mile	0.34	$ 5,000,000.00	$ 1,700,000.00
Hurricane Creek Bridge (28' x 700')	S.F.	19600	$ 340.00	$ 6,664,000.00
Site Preparation (10%)	L.S.	1	$ 1,236,512.00	$ 1,236,512.00
Traffic Control (1%)	L.S.	1	$ 124,531.00	$ 124,531.00
Erosion Control (3%)	L.S.	1	$ 373,789.00	$ 373,789.00
Contingency (20%)	L.S.	1	$ 2,295,745.00	$ 2,295,745.00
Total Estimated Construction Cost				$ 12,394,577.00
Additional Associated Costs				
Utility Relocation (10%)	L.S.	1	$ 1,239,458.00	$ 1,239,458.00
Engineering and Survey Fee (18%)	L.S.	1	$ 2,231,024.00	$ 2,231,024.00
RW Acquisition and Easements (2%)	L.S.	1	$ 247,892.00	$ 247,892.00
Total Estimated Project Cost				$ 16,113,000.00

Appendix D

Phase 2

Hidden Forest Subdivision Improvements

Comprehensive Drainage Master Plan

City of Bryant

Phase 2

Hidden Forest Subdivision Improvements

Prepared by:

GARVER

4701 Northshore Drive

North Little Rock, Arkansas 72118

January 2025

Garver Project No.: 20T20090

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Appendices

Appendix D-1: Conceptual Layout and Planning Level Opinion of Project Costs

List of Figures

List of Tables

1.0 Overall Project Description

A Comprehensive Drainage Master Plan (CDMP) is being developed for the City of Bryant. The purpose of the City of Bryant CDMP is to:

- Evaluate the existing drainage conditions of the City and Extra-Territorial Jurisdiction (ETJ), also known as the planning area;
- Identify current and future drainage problems;
- Generate proposed solutions to identified problems;
- Develop a Capital Improvement Plan (CIP); and
- Provide tools for managing future development.

The CDMP project is being performed in two (2) phases. Phases 1 and 2 will be divided into major tasks, with subtasks listed as applicable below these major tasks. **Figure 1** shows a flow chart of the overall project process.

- Phase 1: Data Collection and Initial Drainage Study Screening
- Phase 2: Survey Collection, Hydrologic and Hydraulic Modeling, Identification of Drainage Problems, Alternative Development, and CIP Development

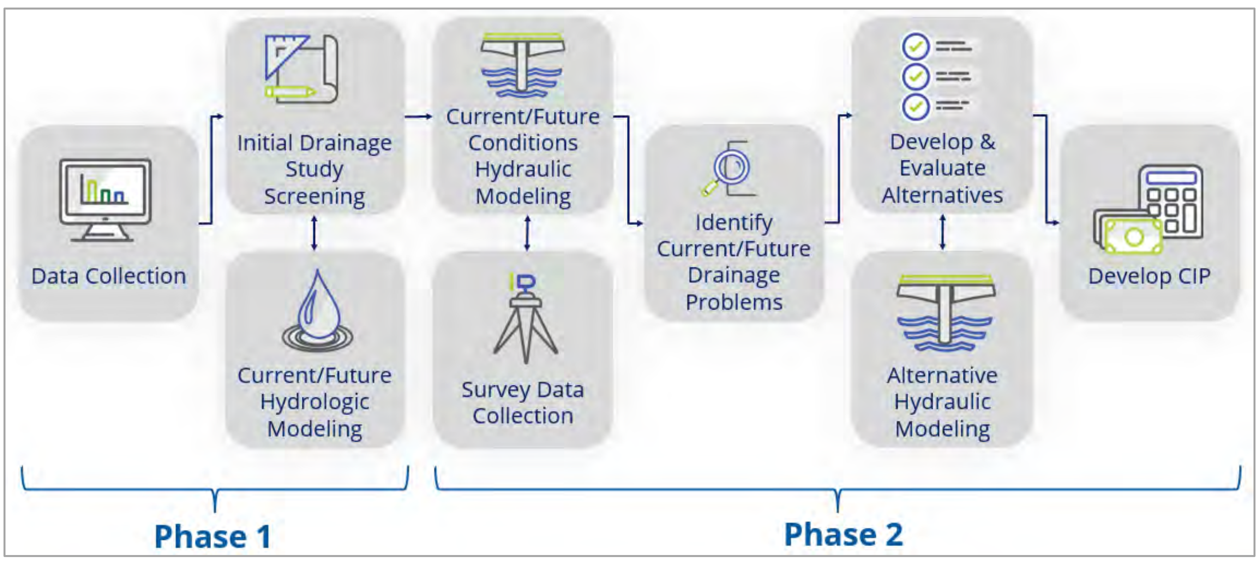


Figure 1. CDMP Project Process

This report discusses the processes and findings of a Phase 2 study within the Hidden Forest Subdivision.

2.0 General Subdivision Information

The Hidden Forest subdivision is located within the Crooked Creek drainage basin. The subdivision is located just south of the Union Pacific Railroad and alongside the newly completed Bryant Parkway. The subdivision was constructed in the early 2000's, showing complete as of December 2005 according to Google Earth Historical Imagery. A project location map is shown in **Figure 2**.

3.0 National Flood Insurance Program (NFIP) Data

The City of Bryant participates in the FEMA National Flood Insurance Program (NFIP). Current floodplain information and mapping is available in Flood Insurance Study (FIS) Report numbers 05125CV0001B and V0002B for Saline County, Arkansas, and Incorporated Areas. The City is mapped within Flood Insurance Rate Map (FIRM) Panels 0225E, 0240E, 0360E, 0370E, and 0380E. The Hidden Forest subdivision is entirely within Panel 0380E.

The Hidden Forest Subdivision is located within Zone X. The Effective floodplain mapping for the project area is shown in **Figure 3**.

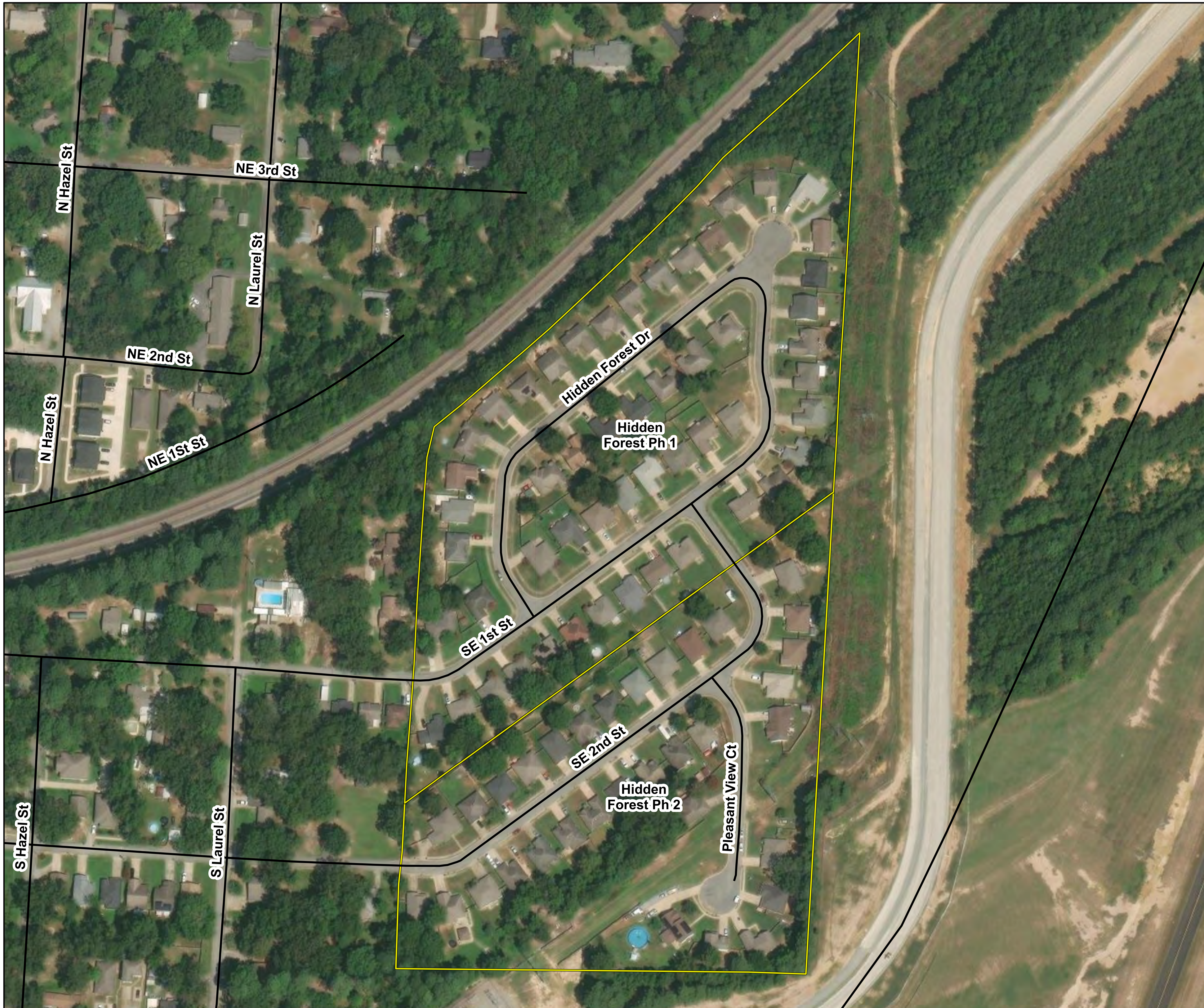
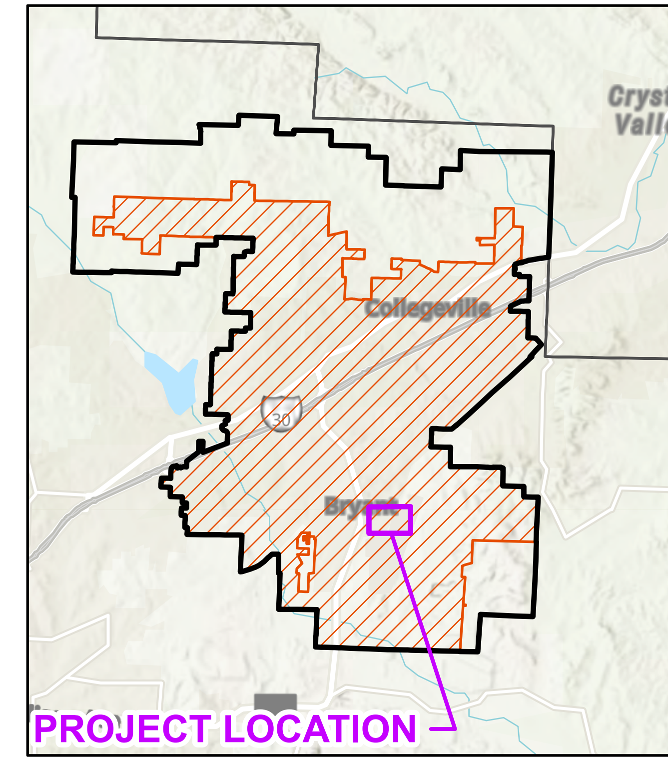


FIGURE 2.
PROJECT LOCATION MAP



Legend

- ROADS
- HIDDEN FOREST PH 1
- HIDDEN FOREST PH 2

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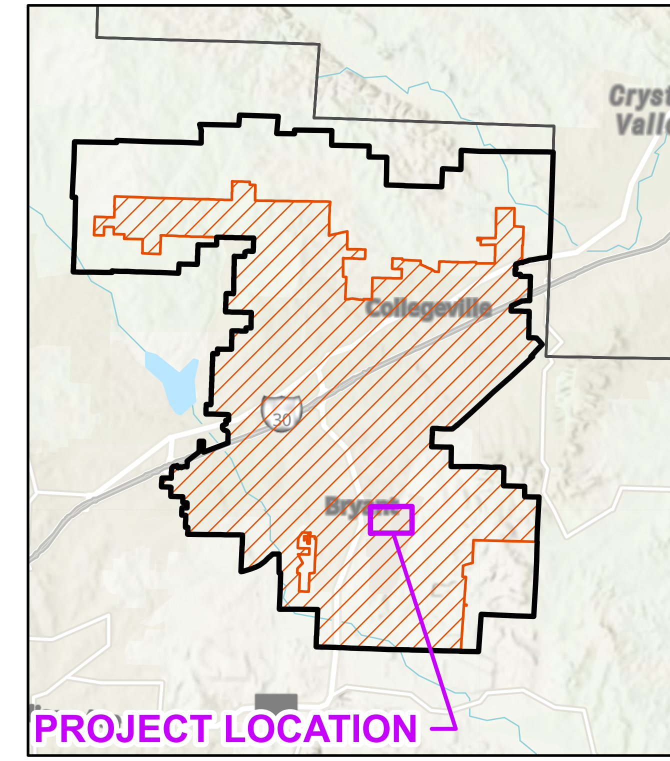
US Feet
NAD83 State Plane Arkansas South

CITY OF BRYANT ARKANSAS

GARVER

FIGURE 3. FIRM PANEL MAP



Legend

- ROADS
- HIDDEN FOREST PH 1
- HIDDEN FOREST PH 2
- STREAMS
- FEMA LETTERED SECTIONS
- BASE FLOOD ELEVATIONS
- EFFECTIVE FIRM PANEL BOUNDARIES*
- EFFECTIVE 1% ANNUAL CHANCE FLOOD HAZARD*
- EFFECTIVE FLOODWAY*
- EFFECTIVE 0.2% ANNUAL CHANCE FLOOD HAZARD*

*Digital National Flood Hazard Layer (NFHL) data acquired from the FEMA Map Service Center for Saline County, Arkansas. 05125C0380E dated effective 06/05/2020.

N W E S

0 100 200 300 US Feet

NAD83 State Plane Arkansas South

CITY OF BRYANT ARKANSAS

GARVER

4.0 Data Collection

4.1 Historical Records of Drainage and Flooding

4.1.1 City and Public News Records

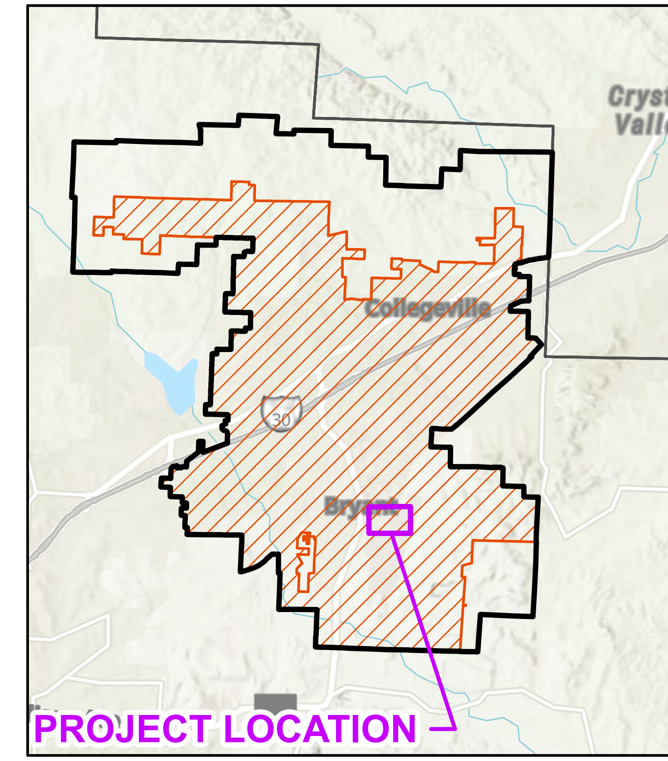
The City has received many complaints concerning drainage within the Hidden Forest Subdivision, including issues with drainage ditches that are located behind homes, as well as some street flooding. Some of these locations are shown in photographs in Figures 5 and 6.

4.1.2 Resident Comment Database

For this CDMP, a public comment period was issued to allow city residents to submit drainage issues. The comment period ran from April 10 to May 22, 2022. A total of 264 comments were received for the city planning area. Two comments were within the Hidden Forest subdivision project area**.**

The known flood areas and resident comment locations are provided on **Figure 4.**

FIGURE 4.
DRAINAGE ISSUE MAP



Legend

- HOUSE/BUSINESS ISSUE
- ROAD ISSUE
- YARD ISSUE
- OTHER ISSUE
- ROADS
- HIDDEN FOREST PH 1
- HIDDEN FOREST PH 2

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W E
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0 100 200 300
US Feet
NAD83 State Plane Arkansas South

CITY OF BRYANT ARKANSAS

GARVER

Figure 5. Drainage Ditch between SE 1st Street and Hidden Forest Drive

Figure 6. Cove at intersection of SE 1st Street and Hidden Forest Drive

4.2 As-built Plans and Data for Existing Infrastructure

The City provided as-built plans for Phases 1, and 2 of the Hidden Forest subdivision. This data was utilized to identify the existing stormwater network location and sizing.

4.3 GIS and Topographic Data

GIS data was collected for the CDMP and utilized for the Hidden Forest subdivision study. Collected data included city and planning area limits, stormwater points and flowlines, subdivision boundaries, NFHL data, land use data, and topographic data.

For this project, 1-meter Digital Elevation Model (DEM) lidar topography from USGS Ouachita study was acquired from the Arkansas GIS Office. Additionally, Garnat collected drainage structure survey throughout the subdivision.

5.0 Initial Screening Study

During Phase 1, an Initial Screening Study was performed for the Crooked Creek basin. For this screening, a hydraulic model was developed for the entire basin using 2D HEC-RAS and utilized rain-on-grid methodology to apply precipitation directly to the ground surface. This model was used to identify flood issues throughout the City, so is considered a qualitative model and not to be used for design. However, the data is useful in determining relative flood risk, and a flood severity index (FSI) was developed using the model results. Flood severity ranges from 0 to 4, with 4 being the most severe. The FSI classifications are listed in **Table 1**. **Table 2** displays the FSI rankings for the Hidden Forest Subdivision.

Table 1. Flood Severity Index Classes

Class	Description	Maximum Flood Depth (ft)	Maximum Flood Velocity (ft/s)
FS0	Minimal severity	< 0.5	-
FS1	Unsafe for vehicles and pedestrians	< 1.5	< 6.0
FS2	Moderate flooding hazard for buildings	< 3	< 6.0
FS3	Potential for structural damage	> 3	< 6.0
FS4	Unsafe for vehicles and pedestrians; Potential for structural damage	> 0.5	>6.0

Table 2. Flood Severity Index For Hidden Forest Subdivision

Location	Stream Name	Basin	Potential Drainage Issue	Flood Severity Index			
				5 yr	10 yr	50 yr	100 yr
Hidden Forest Subdivision	N/A	Crooked Creek	Neighborhood flooding; home flooding	1	1	1	1

Because of the high likelihood of flooding at multiple storm events, and historical flood issues in the area, the Hidden Forest subdivision was selected for further hydraulic study in order to identify conceptual drainage improvements.

6.0 XPSWMM Hydraulic Model

6.1 Existing Conditions Model

The Existing Conditions model was developed to represent the current conditions of the project area at the time the project modeling was performed. Details are given in the following sections.

6.1.1 Model Hydrology

The XPSWMM model utilizes rain-on-grid precipitation data to represent the flow within the model limits. This modeling approach used an excess precipitation hyetograph input as a distributed inflow boundary condition for the 2D model mesh. The excess precipitation hyetograph represents the precipitation that is converted to runoff from the watershed; i.e., the precipitation that is not infiltrated, evaporated, stored, or otherwise consumed by environmental features.

HEC-HMS v. 4.12 software was used to transform the precipitation hyetograph to the excess precipitation hyetograph for application of the rain-on-mesh methodology. The land use and soil characteristics of the area were used to develop a composite Natural Resources Conservation Service (NRCS, formerly Soil Conservation Service, SCS) curve number for the drainage area. Since the excess precipitation hyetograph is required for input to the rain-on-mesh 2D hydraulic model, the NRCS curve number is the only required hydrologic parameter in the HEC-HMS model.

Atlas 14 data was utilized to determine the point-precipitation hyetograph for each hypothetical frequency storm simulated in the HEC-HMS program. The HEC-HMS program output provided the excess precipitation hyetograph for each of the flow frequencies modeled for this project.

6.1.2 Existing Conditions Model Geometry

The downstream boundary condition was set to normal depth slope at the downstream end of the model. The DTM for the 2D model was built from the lidar data, project survey, and design plans for newer constructed areas not reflected in the lidar. The Manning's n layer was set based on land use. The rainfall layer was set to the same extents as the grid layer and set to use a SCS Type III rainfall distribution with a cumulative depth equal to the 24-hour NOAA Atlas 14 precipitation depth for the corresponding storm interval.

The 1D elements were compared to the survey data and updated as needed. The conduit and junction shapefiles included in the model accurately represented the elevations and lengths in the received survey, with few assumptions regarding connections. Channels were added as 1D elements using surveyed cross sections. The existing stormwater system is displayed in Figure 10.

The model was set to run for 24 hours at a 1-minute time step. This run time allowed for the outflow hydrograph to reach its peak and for the falling limb to dissipate.

6.2 Proposed Conditions Model Geometry

The existing conditions model results was reviewed and problem areas within the subdivision were identified. After discussions with the City, specific locations within the Hidden Forest subdivision were selected for proposed alternative development. The proposed alternatives were developed in order to meet a 25-year design event. Model geometry was updated for proposed conditions to reflect any updated pipe sizes, inlet sizes and locations, and grading. The proposed design is shown in Figure 8.

In order to improve flood conditions in the Hidden Forest subdivision, drainage improvements along the Northeastern section of the neighborhood are recommended. This includes the installation of additional stormwater drainage along SE 1ST Street and SE 2nd Street as well as regrading the drainage ditches throughout the Phase 1 section of neighborhood. It is also recommended to regrade the detention pond that sits in the Northeastern corner of the neighborhood.

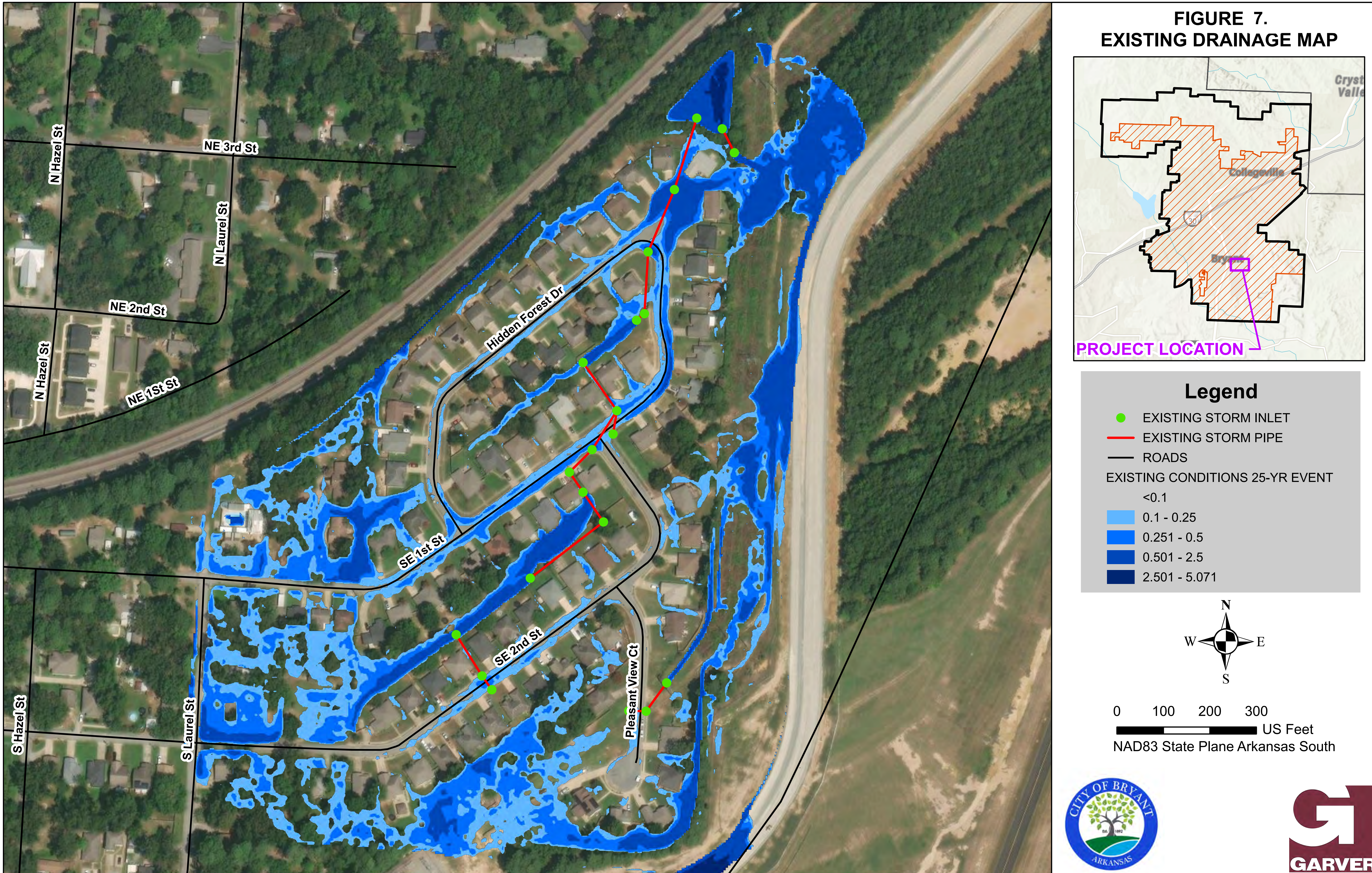
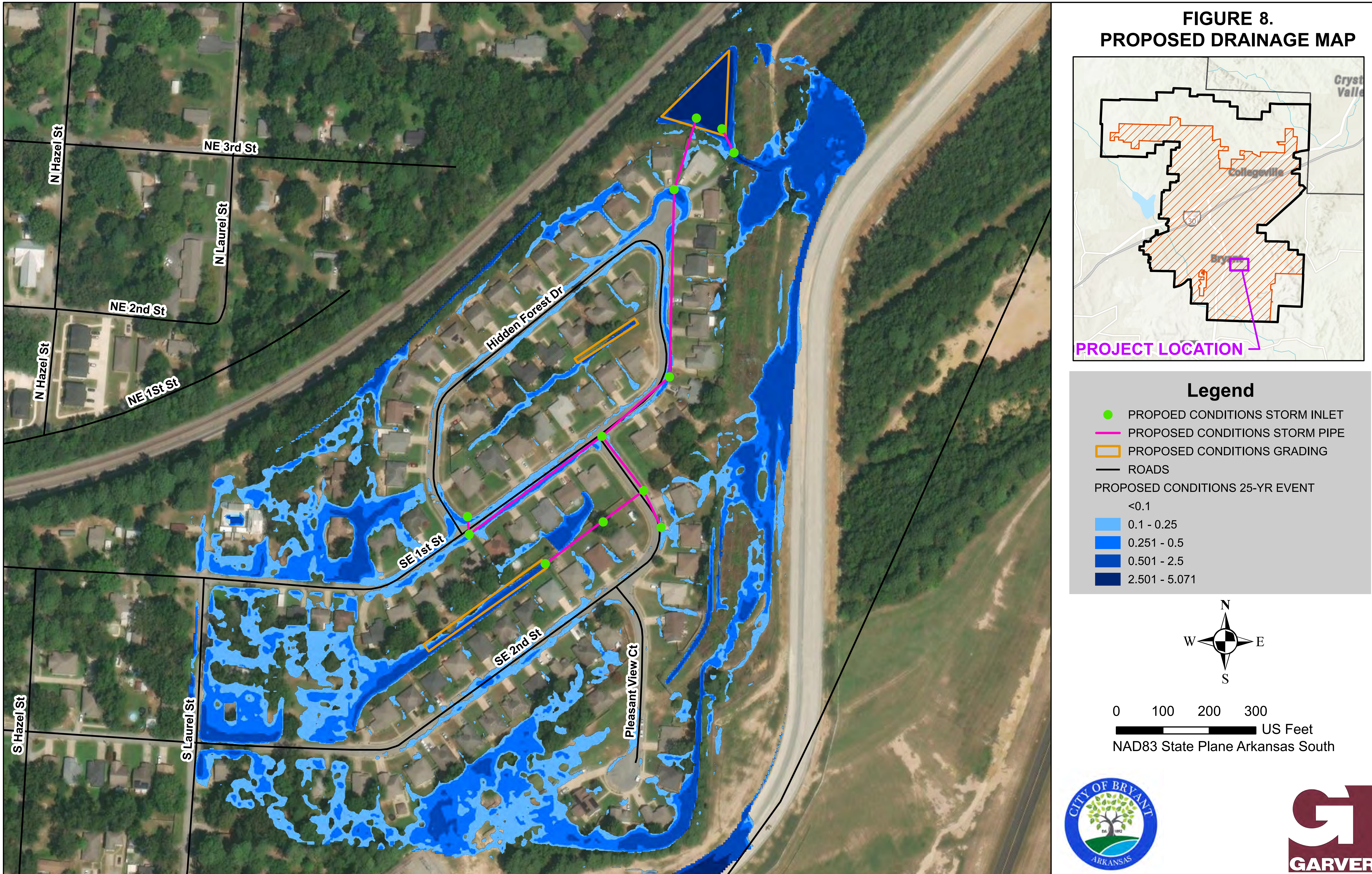


FIGURE 7.
EXISTING DRAINAGE MAP

FIGURE 8.
PROPOSED DRAINAGE MAP



7.0 Conceptual Layout and Planning Level Opinion of Project Costs

A conceptual layout drawing and planning level opinion of project costs are provided in Appendix D-1. This layout is for graphical and planning purposes only and is not for construction.

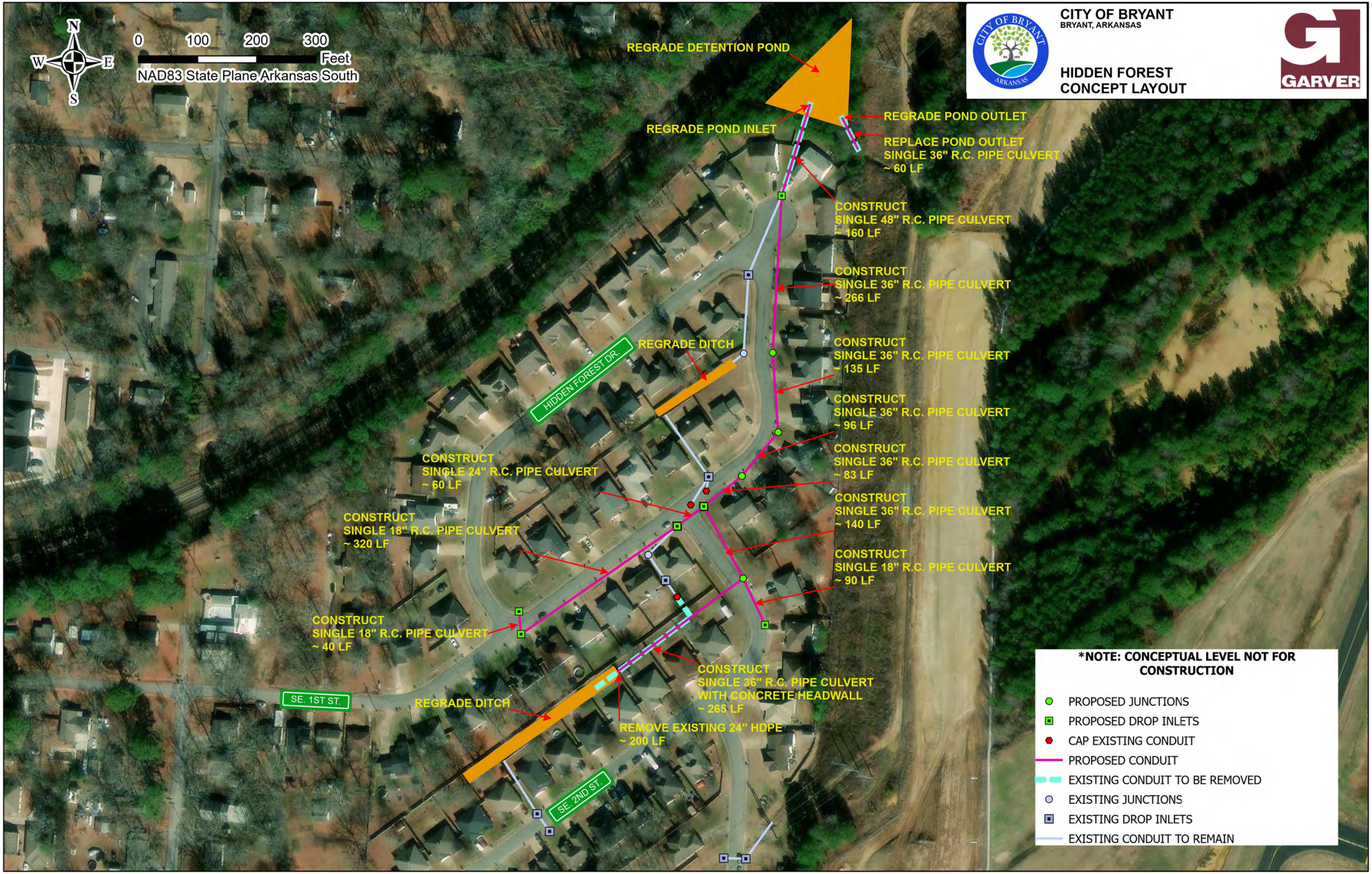
Appendix D-1

Phase 2

Hidden Forest Subdivision Improvements

Conceptual Layout and

Planning Level Opinion of Project Costs



CITY OF BRYANT
BRYANT, ARKANSAS
HIDDEN FOREST
CONCEPT LAYOUT
GARVER
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NAD83 State Plane Arkansas South
REGRADE DETENTION POND
REGRADE POND INLET
REGRADE POND OUTLET
REPLACE POND OUTLET SINGLE 36" R.C. PIPE CULVERT ~ 60 LF
CONSTRUCT SINGLE 48" R.C. PIPE CULVERT ~ 160 LF
CONSTRUCT SINGLE 36" R.C. PIPE CULVERT ~ 266 LF
CONSTRUCT SINGLE 36" R.C. PIPE CULVERT ~ 135 LF
CONSTRUCT SINGLE 36" R.C. PIPE CULVERT ~ 96 LF
CONSTRUCT SINGLE 36" R.C. PIPE CULVERT ~ 83 LF
CONSTRUCT SINGLE 36" R.C. PIPE CULVERT ~ 140 LF
CONSTRUCT SINGLE 18" R.C. PIPE CULVERT ~ 90 LF
REGRADE DITCH
HIDDEN FOREST DR.
CONSTRUCT SINGLE 24" R.C. PIPE CULVERT ~ 60 LF
CONSTRUCT SINGLE 18" R.C. PIPE CULVERT ~ 320 LF
CONSTRUCT SINGLE 18" R.C. PIPE CULVERT ~ 40 LF
CONSTRUCT SINGLE 36" R.C. PIPE CULVERT WITH CONCRETE HEADWALL ~ 265 LF
SE. 1ST ST.
REGRADE DITCH
REMOVE EXISTING 24" HDPE ~ 200 LF
SE. 2ND ST.
*NOTE: CONCEPTUAL LEVEL NOT FOR CONSTRUCTION
PROPOSED JUNCTIONS
PROPOSED DROP INLETS
CAP EXISTING CONDUIT
PROPOSED CONDUIT
EXISTING CONDUIT TO BE REMOVED
EXISTING JUNCTIONS
EXISTING DROP INLETS
EXISTING CONDUIT TO REMAIN

Planning Level Opinion of Project Costs Hidden Forest Subdivision Improvements				
Item Description	Unit	Quantity	Unit Cost	Total Cost
Unclassified Excavation	C.Y.	374	$ 30.00	$ 11,220.00
18" Reinforced Concrete Pipe Culvert, Class III	L.F.	450	$ 114.00	$ 51,300.00
24" Reinforced Concrete Pipe Culvert, Class III	L.F.	60	$ 146.00	$ 8,760.00
36" Reinforced Concrete Pipe Culvert, Class III	L.F.	1045	$ 252.00	$ 263,340.00
48" Reinforced Concrete Pipe Culvert, Class III	L.F.	160	$ 380.00	$ 60,800.00
Drop Inlets	Each	6	$ 9,000.00	$ 54,000.00
Area Inlets	Each	3	$ 9,000.00	$ 27,000.00
Junction Box (Type E)	Each	4	$ 8,000.00	$ 32,000.00
Concrete Headwall (36")	Each	1	$ 5,000.00	$ 5,000.00
Driveway Pavement Repair	S.Y.	99	$ 140.00	$ 13,860.00
Asphalt Pavement Repair	S.Y.	130	$ 200.00	$ 26,000.00
Pipe Embedment	C.Y.	335	$ 60.00	$ 20,100.00
Site Preparation (10%)	L.S.	1	$ 84,767.00	$ 84,767.00
Traffic Control (1%)	L.S.	1	$ 8,537.00	$ 8,537.00
Erosion Control (3%)	L.S.	1	$ 25,624.00	$ 25,624.00
Contingency (20%)	L.S.	1	$ 171,091.00	$ 171,091.00
Total Estimated Construction Cost				$ 863,399.00
Additional Associated Costs				
Utility Relocation (10%)	L.S.	1	$ 86,340.00	$ 86,340.00
Engineering and Survey Fee (18%)	L.S.	1	$ 155,412.00	$ 155,412.00
RW Acquisition and Easements (2%)	L.S.	1	$ 17,268.00	$ 17,268.00
Total Estimated Project Cost				$ 1,122,400.00

Appendix E

Phase 2

Meadow Lake Subdivision Improvements

Comprehensive Drainage Master Plan

City of Bryant

Phase 2

Meadow Lake Subdivision Improvements

Prepared by:

GARVER

4701 Northshore Drive

North Little Rock, Arkansas 72118

January 2025

Garver Project No.: 20T20090

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Appendices

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List of Tables

1.0 Overall Project Description

A Comprehensive Drainage Master Plan (CDMP) is being developed for the City of Bryant. The purpose of the City of Bryant CDMP is to:

- Evaluate the existing drainage conditions of the City and Extra-Territorial Jurisdiction (ETJ), also known as the planning area;
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- Provide tools for managing future development.

The CDMP project is being performed in two (2) phases. Phases 1 and 2 will be divided into major tasks, with subtasks listed as applicable below these major tasks. **Figure 1** shows a flow chart of the overall project process.

- Phase 1: Data Collection and Initial Drainage Study Screening
- Phase 2: Survey Collection, Hydrologic and Hydraulic Modeling, Identification of Drainage Problems, Alternative Development, and CIP Development

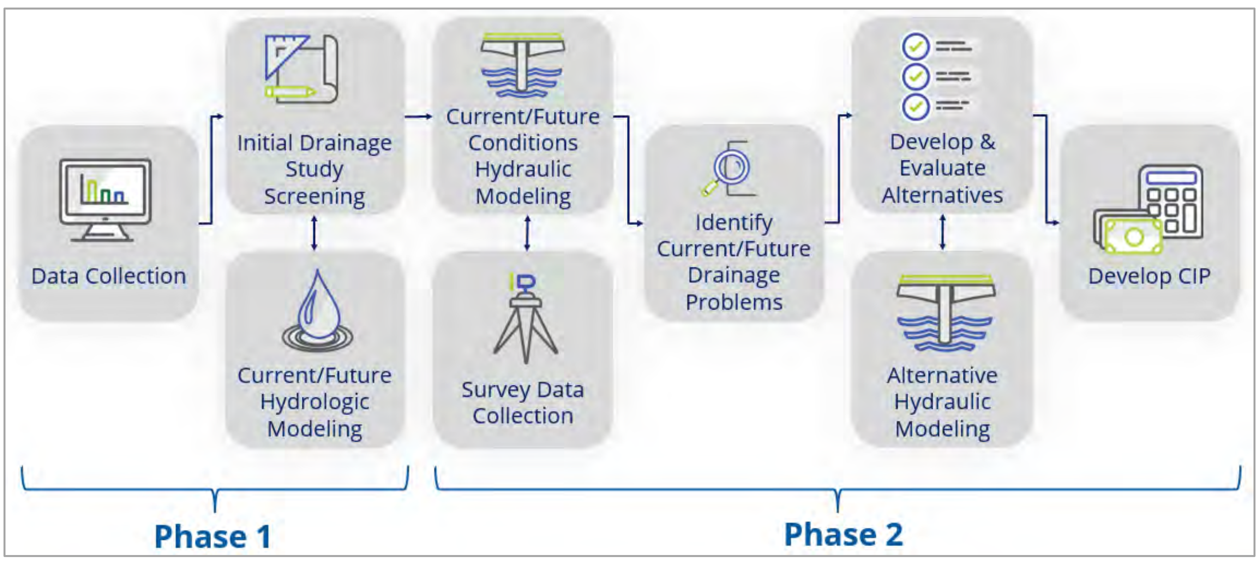


Figure 1. CDMP Project Process

This report discusses the processes and findings of a Phase 2 study within the Meadow Lake Subdivision.

2.0 General Subdivision Information

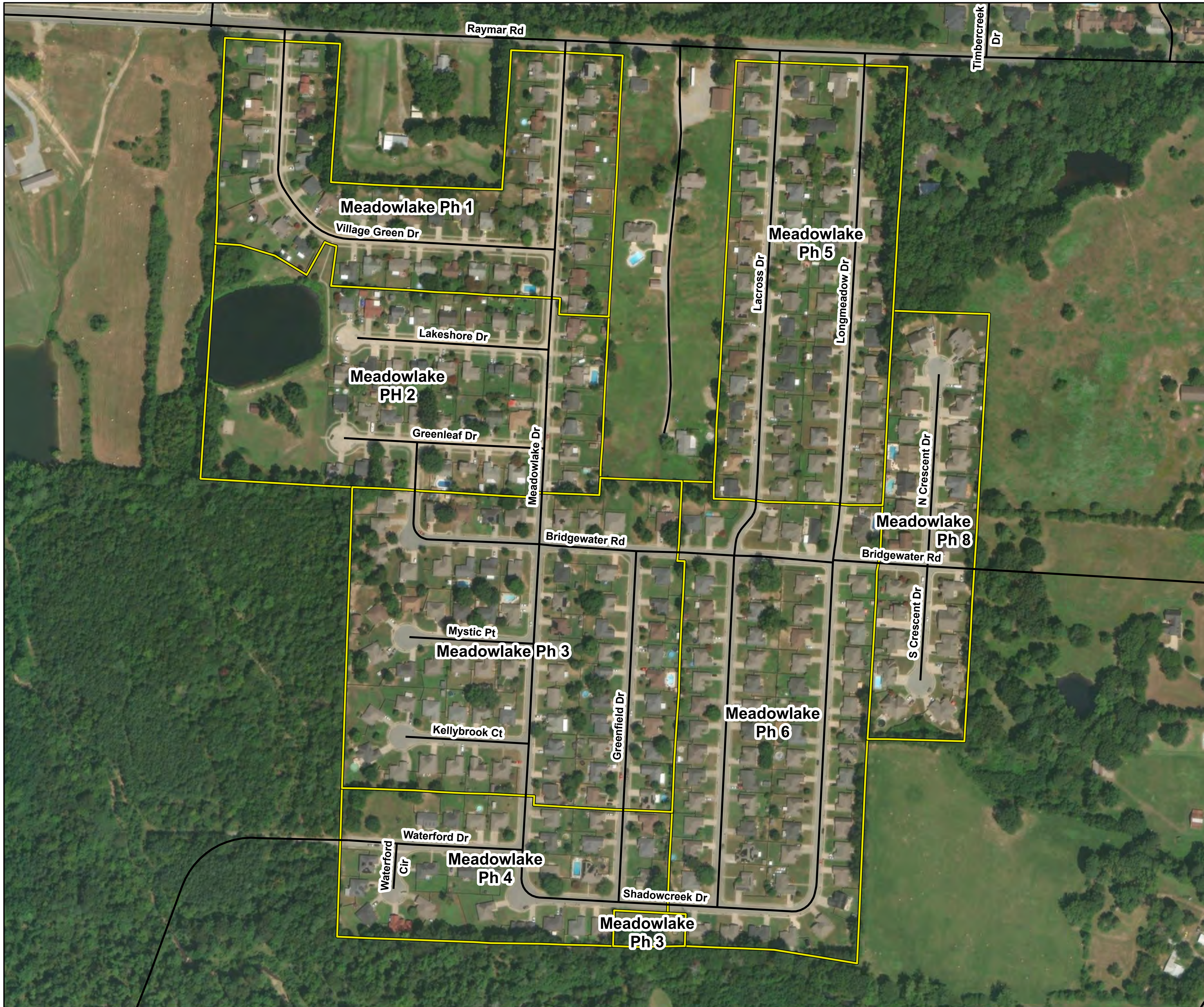
The Meadowlake subdivision is located within the Crooked Creek drainage basin. The subdivision located within the east-central region of the city planning boundary. The subdivision was constructed in 7 phases, Phases 1 through 6 and Phase 8. Construction of the subdivision began in the late 1990's, with all phases constructed by 2009, according to Google Earth Historic Imagery. A project location map is shown in Figure 2.

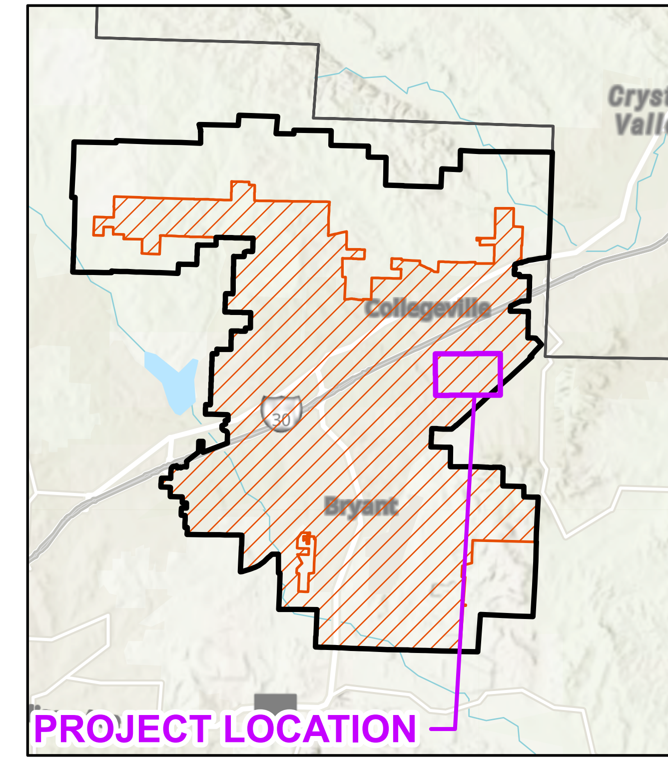
3.0 National Flood Insurance Program (NFIP) Data

The City of Bryant participates in the FEMA National Flood Insurance Program (NFIP). Current floodplain information and mapping is available in Flood Insurance Study (FIS) Report numbers 05125CV0001B and V0002B for Saline County, Arkansas, and Incorporated Areas. The City is mapped within Flood Insurance Rate Map (FIRM) Panels 0225E, 0240E, 0360E, 0370E, and 0380E. The Meadowlake subdivision is located within Panel 0240E and Panel 0380E.

Crooked Creek is mapped as Zone AE with floodway. However, the Meadowlake subdivision is located within Zone X. An unnamed tributary to Crooked Creek flows just south of the subdivision; a portion of it is mapped as backwater Zone AE from Crooked Creek The Effective floodplain mapping for the project area is shown in Figure 3.

FIGURE 2.
PROJECT LOCATION MAP





Legend

ROADS

SUBDIVISION BOUNDARY

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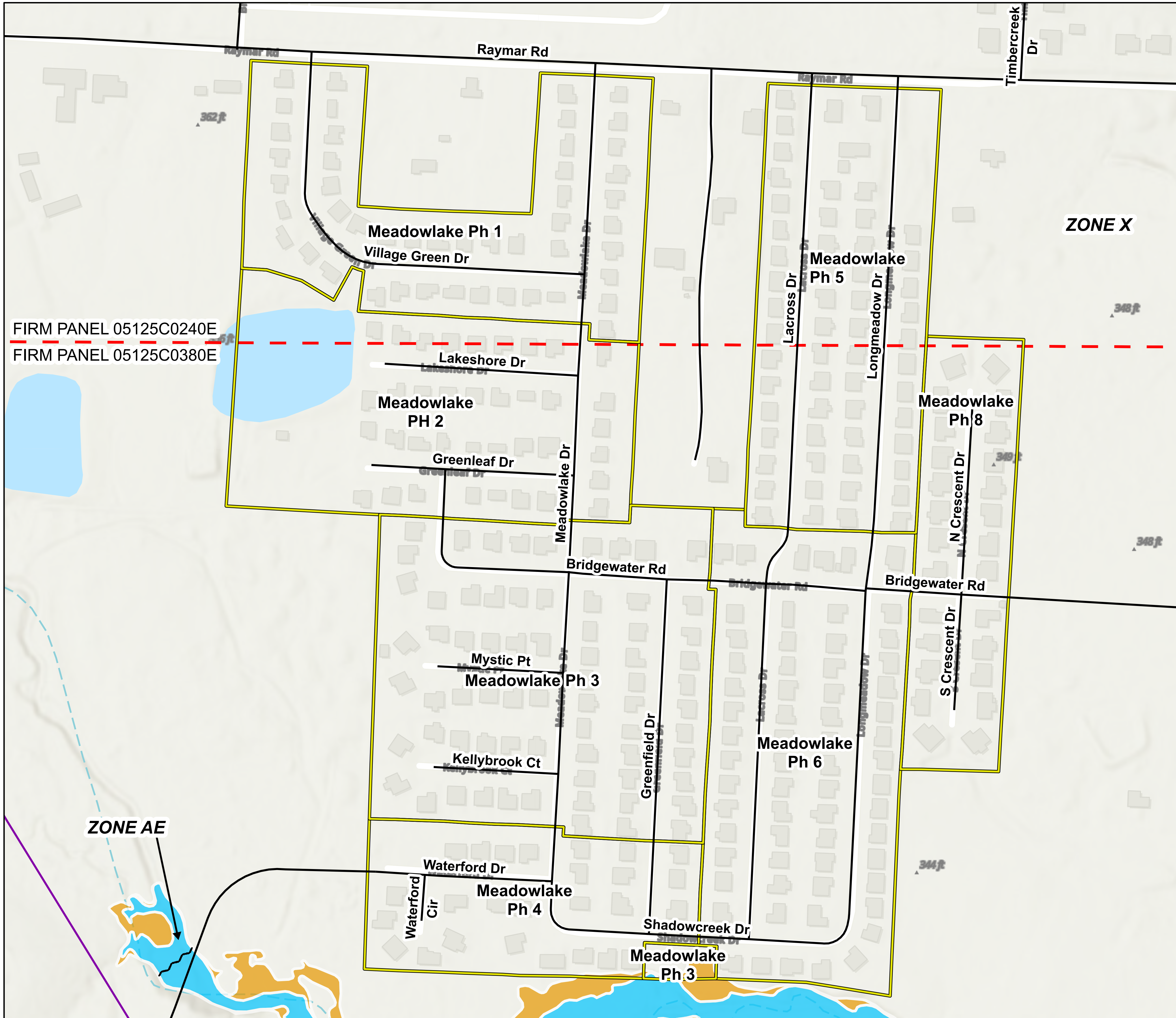
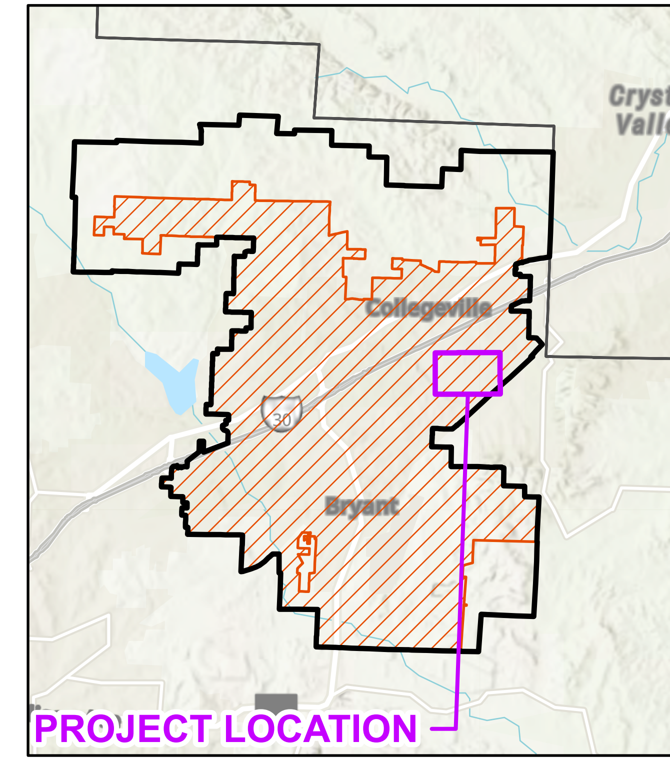
US Feet
NAD83 State Plane Arkansas South

CITY OF BRYANT ARKANSAS

GARVER

FIGURE 3. FIRM PANEL MAP





Legend

- ROADS
- SUBDIVISION BOUNDARY
- STREAMS
- FEMA LETTERED SECTIONS
- BASE FLOOD ELEVATIONS
- EFFECTIVE FIRM PANEL BOUNDARIES*
- EFFECTIVE 1% ANNUAL CHANCE FLOOD HAZARD*
- EFFECTIVE FLOODWAY*
- EFFECTIVE 0.2% ANNUAL CHANCE FLOOD HAZARD*

*Digital National Flood Hazard Layer (NFHL) data acquired from the FEMA Map Service Center for Saline County, Arkansas. 05125C0240E and 05125C0380E dated effective 06/05/2020.

N W E S

0 100 200 300 US Feet

NAD83 State Plane Arkansas South

CITY OF BRYANT ARKANSAS Est. 1892

GARVER

4.0 Data Collection

4.1 Historical Records of Drainage and Flooding

4.1.1 City and Public News Records

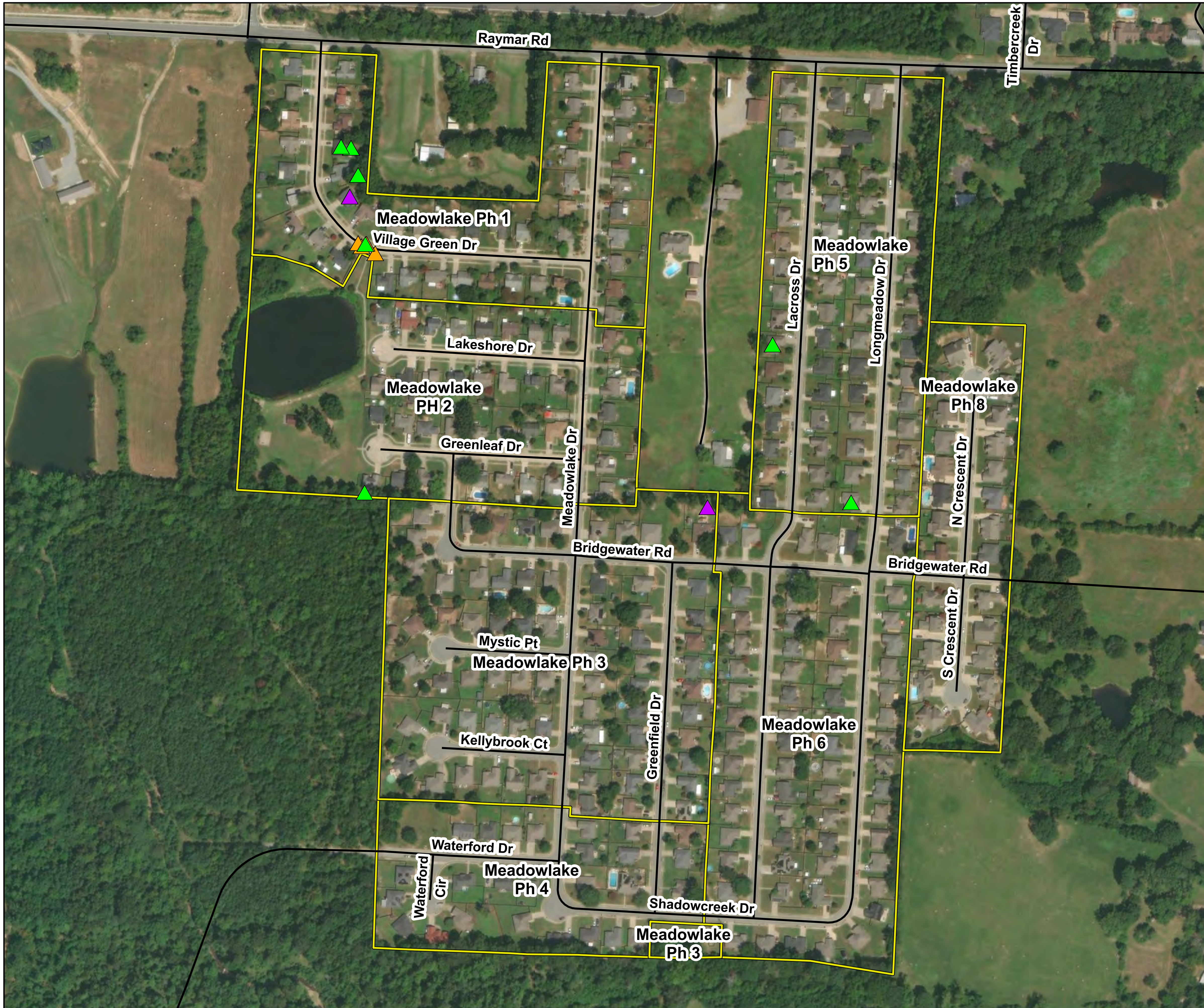
The City has received multiple drainage complaints in past years about areas within the Meadowlake Subdivision, including yard flooding and roadway flooding during frequent storm events. A photograph of the pond located near Village Green Drive, which has had reported flooding, is shown in Figure 5. One of the many large inlet structures located throughout the subdivision is shown in Figure 6.

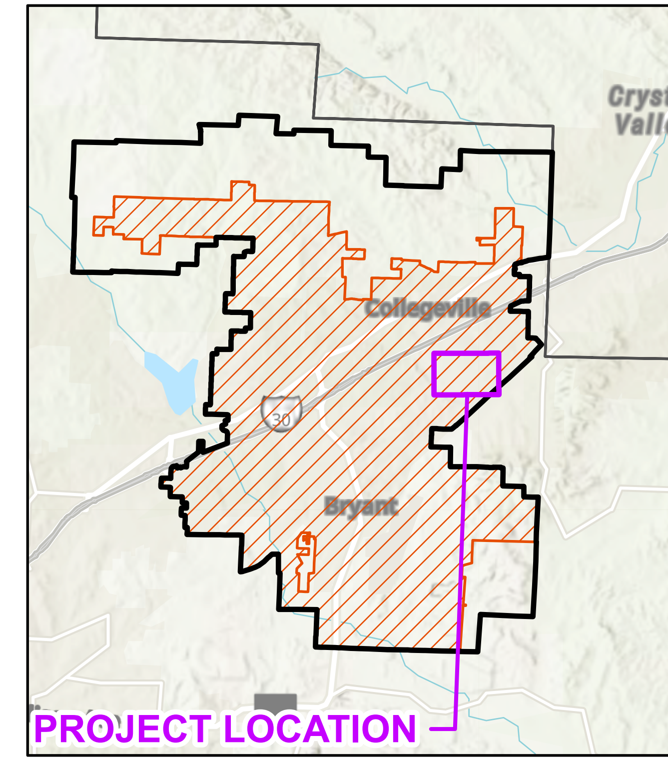
4.1.2 Resident Comment Database

For this CDMP, a public comment period was issued to allow city residents to submit drainage issues. The comment period ran from April 10 to May 22, 2022. A total of 264 comments were received for the city planning area. Twelve comments were within the Meadowlake subdivision project area.

The known flood areas and resident comment locations are provided on Figure 4.

FIGURE 4.
DRAINAGE ISSUE MAP





Legend

- HOUSE/BUSINESS ISSUE
- ROAD ISSUE
- YARD ISSUE
- OTHER ISSUE
- ROADS
- SUBDIVISION BOUNDARY

N
W E
S

0 100 200 300
US Feet
NAD83 State Plane Arkansas South

CITY OF BRYANT ARKANSAS

GARVER

Figure 5. Pond at Northwestern Corner of Meadowlake Subdivision

Figure 6. Inlet Structure near Waterford Drive

4.2 As-built Plans and Data for Existing Infrastructure

The City provided as-built plans for the Meadowlake subdivision. This data was utilized to identify the existing stormwater network location and sizing. Additionally, Garnat collected extensive survey data for the stormwater network for this project.

4.3 GIS and Topographic Data

GIS data was collected for the CDMP and utilized for the Meadowlake subdivision study. Collected data included city and planning area limits, stormwater points and flowlines, subdivision boundaries, NFHL data, land use data, and topographic data.

For this project, 1-meter Digital Elevation Model (DEM) lidar topography from USGS Ouachita study was acquired from the Arkansas GIS Office.

5.0 Initial Screening Study

During Phase 1, an Initial Screening Study was performed for the Crooked Creek basin. For this screening, a hydraulic model was developed for the entire basin using 2D HEC-RAS and utilized rain-on-grid methodology to apply precipitation directly to the ground surface. This model was used to identify flood issues throughout the City, so is considered a qualitative model and not to be used for design. However, the data is useful in determining relative flood risk, and a flood severity index (FSI) was developed using the model results. Flood severity ranges from 0 to 4, with 4 being the most severe. The FSI classification are listed in **Table 1**. **Table 2** displays the FSI rankings for Meadowlake subdivision.

Table 1. Flood Severity Index Classes

Class	Description	Maximum Flood Depth (ft)	Maximum Flood Velocity (ft/s)
FS0	Minimal severity	< 0.5	-
FS1	Unsafe for vehicles and pedestrians	< 1.5	< 6.0
FS2	Moderate flooding hazard for buildings	< 3	< 6.0
FS3	Potential for structural damage	> 3	< 6.0
FS4	Unsafe for vehicles and pedestrians; Potential for structural damage	> 0.5	>6.0

Table 2. Flood Severity Index For Meadowlake Subdivision

Location	Stream Name	Basin	Potential Drainage Issue	Flood Severity Index			
				5 yr	10 yr	50 yr	100 yr
Meadowlake	Unnamed Tributary to Crooked Creek	Crooked Creek	Neighborhood flooding	2	2	2	2

Because of the high likelihood of flooding at multiple storm events, and historical flood issues in the area, Meadowlake subdivision was selected for further hydraulic study in order to identify conceptual drainage improvements.

6.0 XPSWMM Hydraulic Model

6.1 Existing Conditions Model

The Existing Conditions model was developed to represent the current conditions of the project area at the time the project modeling was performed. Details are given in the following sections.

6.1.1 Model Hydrology

The XPSWMM model utilizes rain-on-grid precipitation data to represent the flow within the model limits. This modeling approach used an excess precipitation hyetograph input as a distributed inflow boundary condition for the 2D model mesh. The excess precipitation hyetograph represents the precipitation that is converted to runoff from the watershed; i.e., the precipitation that is not infiltrated, evaporated, stored, or otherwise consumed by environmental features.

HEC-HMS v. 4.12 software was used to transform the precipitation hyetograph to the excess precipitation hyetograph for application of the rain-on-mesh methodology. The land use and soil characteristics of the area were used to develop a composite Natural Resources Conservation Service (NRCS, formerly Soil Conservation Service, SCS) curve number for the drainage area. Since the excess precipitation hyetograph is required for input to the rain-on-mesh 2D hydraulic model, the NRCS curve number is the only required hydrologic parameter in the HEC-HMS model.

Atlas 14 data was utilized to determine the point-precipitation hyetograph for each hypothetical frequency storm simulated in the HEC-HMS program. The HEC-HMS program output provided the excess precipitation hyetograph for each of the flow frequencies modeled for this project.

6.1.2 Existing Conditions Model Geometry

The downstream boundary condition was set to normal depth slope at the downstream end of the model. The DTM for the 2D model was built from the lidar data, project survey, and design plans for newer constructed areas not reflected in the lidar. The Manning's n layer was set based on land use. The rainfall layer was set to the same extents as the grid layer and set to use a SCS Type III rainfall distribution with a cumulative depth equal to the 24-hour NOAA Atlas 14 precipitation depth for the corresponding storm interval.

The 1D elements were compared to the survey data and updated as needed. The conduit and junction shapefiles included in the model accurately represented the elevations and lengths in the received survey, with few assumptions regarding connections. Channels were added as 1D elements using surveyed cross sections. The existing stormwater system is displayed in Figure 7.

The model was set to run for 24 hours at a 1-minute time step. This run time allowed for the outflow hydrograph to reach its peak and for the falling limb to dissipate.

6.2 Proposed Conditions Model Geometry

The existing conditions model results was reviewed and problem areas within the subdivision were identified. After discussions with the City, the meadowlake subdivision was selected for proposed alternative development. The proposed alternatives were developed in order to meet a 25-year design event. Model geometry was updated for proposed conditions to reflect any updated pipe sizes, inlet sizes and locations, and grading. The proposed design is shown in Figure 8.

In order to improve flood conditions in the Meadowlake subdivision, drainage improvements along the Southwestern section of the neighborhood and at the detention pond in the northwestern section of the neighborhood are recommended. This includes the installation of additional stormwater drainage at Kellybrooke Court, replacing the majority of the stormwater drainage in the southwestern corner of the neighborhood (around Waterford Drive), and some regrading.

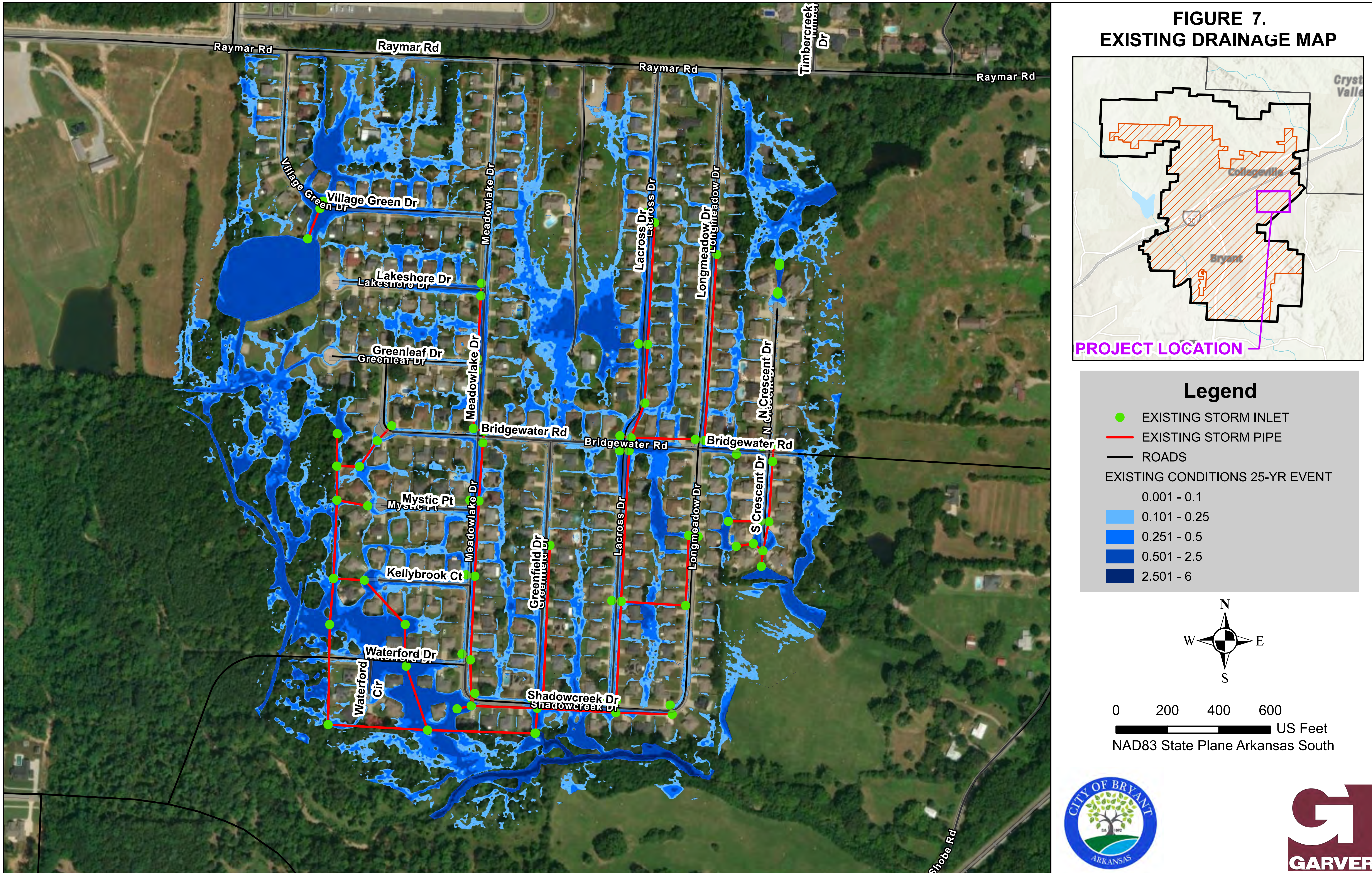


FIGURE 7.
EXISTING DRAINAGE MAP

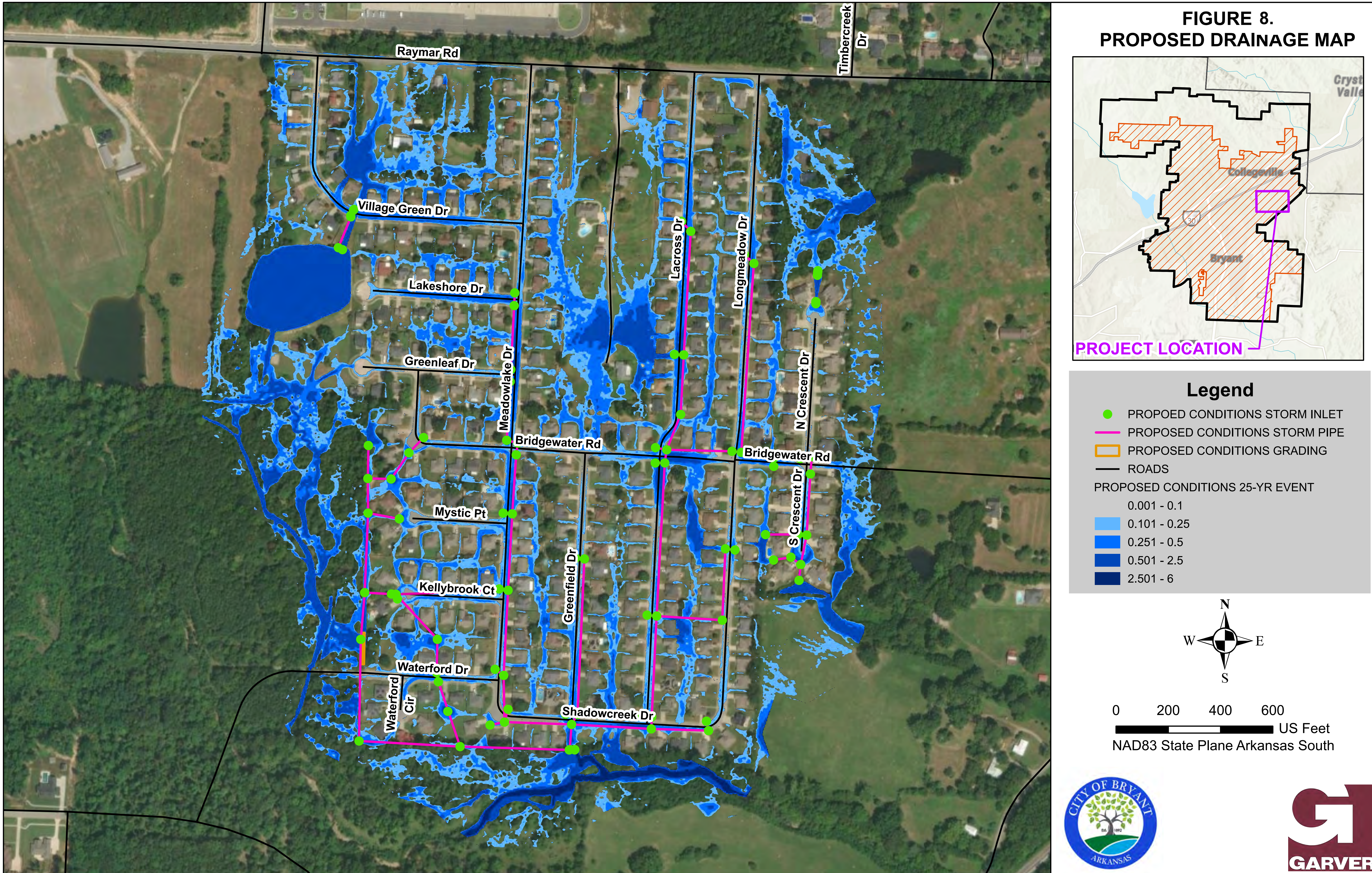


FIGURE 8.
PROPOSED DRAInAGE MAP

7.0 Conceptual Layout and Planning Level Opinion of Project Costs

A conceptual layout drawing and planning level opinion of project costs are provided in Appendix E-1. This layout is for graphical and planning purposes only and is not for construction.

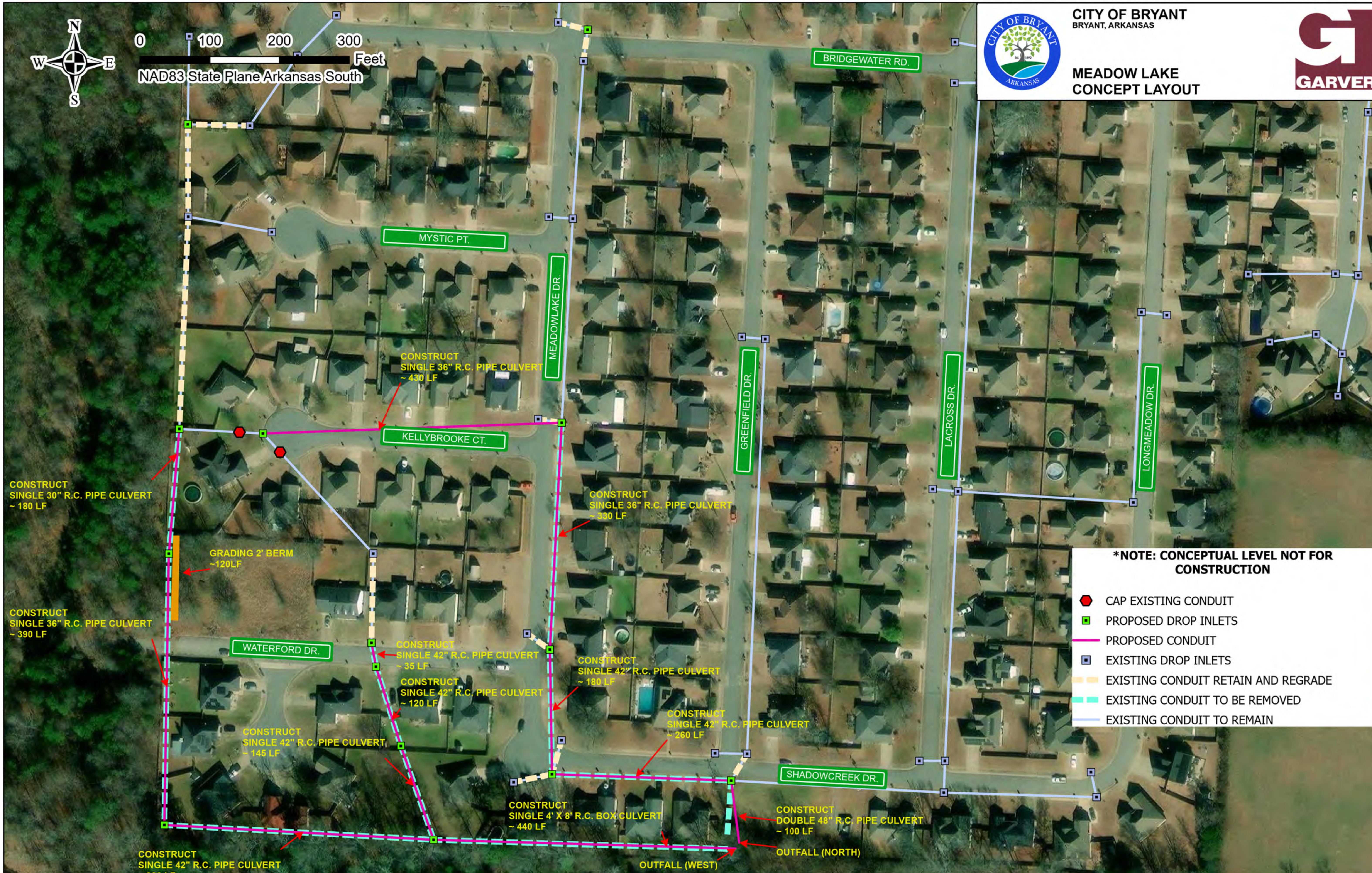
Appendix E-1

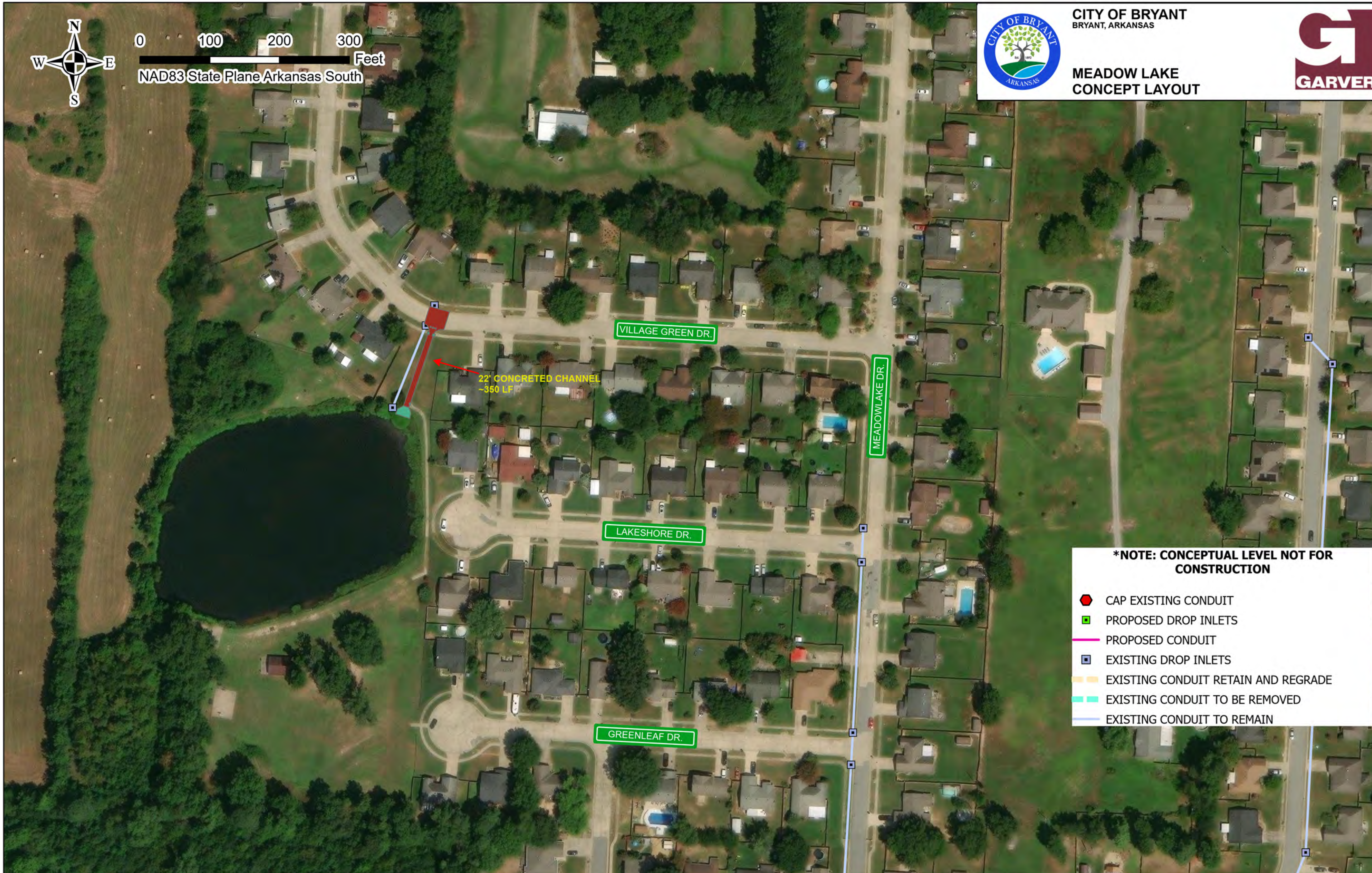
Phase 2

Meadowlake Subdivision Improvements

Conceptual Layout and

Planning Level Opinion of Project Costs


CITY OF BRYANT
BRYANT, ARKANSAS
MEADOW LAKE
CONCEPT LAYOUT
GARVER
0 100 200 300 Feet
NAD83 State Plane Arkansas South
N
S
E
W
BRIDGEWATER RD.
MYSTIC PT.
MEADOWLAKE DR.
KELLYBROOKE CT.
GREENFIELD DR.
LACROSS DR.
LONGMEADOW DR.
WATERFORD DR.
SHADOWCREEK DR.
CONSTRUCT SINGLE 36" R.C. PIPE CULVERT ~ 430 LF
CONSTRUCT SINGLE 30" R.C. PIPE CULVERT ~ 180 LF
CONSTRUCT SINGLE 36" R.C. PIPE CULVERT ~ 330 LF
GRADING 2' BERM ~120LF
CONSTRUCT SINGLE 36" R.C. PIPE CULVERT ~ 390 LF
CONSTRUCT SINGLE 42" R.C. PIPE CULVERT ~ 35 LF
CONSTRUCT SINGLE 42" R.C. PIPE CULVERT ~ 120 LF
CONSTRUCT SINGLE 42" R.C. PIPE CULVERT ~ 180 LF
CONSTRUCT SINGLE 42" R.C. PIPE CULVERT ~ 260 LF
CONSTRUCT SINGLE 42" R.C. PIPE CULVERT ~ 145 LF
CONSTRUCT SINGLE 4' X 8' R.C. BOX CULVERT ~ 440 LF
CONSTRUCT DOUBLE 48" R.C. PIPE CULVERT ~ 100 LF
OUTFALL (NORTH)
OUTFALL (WEST)
CONSTRUCT SINGLE 42" R.C. PIPE CULVERT ~ 390 LF
*NOTE: CONCEPTUAL LEVEL NOT FOR CONSTRUCTION
CAP EXISTING CONDUIT
PROPOSED DROP INLETS
PROPOSED CONDUIT
EXISTING DROP INLETS
EXISTING CONDUIT RETAIN AND REGRADE
EXISTING CONDUIT TO BE REMOVED
EXISTING CONDUIT TO REMAIN



N
W
E
S
0
100
200
300
Feet
NAD83 State Plane Arkansas South
CITY OF BRYANT
BRYANT, ARKANSAS
MEADOW LAKE
CONCEPT LAYOUT
GARVER
VILLAGE GREEN DR.
22' CONCRETED CHANNEL
~350 LF
MEADOWLAKE DR.
LAKESHORE DR.
GREENLEAF DR.
*NOTE: CONCEPTUAL LEVEL NOT FOR CONSTRUCTION
CAP EXISTING CONDUIT
PROPOSED DROP INLETS
PROPOSED CONDUIT
EXISTING DROP INLETS
EXISTING CONDUIT RETAIN AND REGRADE
EXISTING CONDUIT TO BE REMOVED
EXISTING CONDUIT TO REMAIN

Planning Level Opinion of Project Costs Meadow Lake Subdivision Improvements				
Item Description	Unit	Quantity	Unit Cost	Total Cost
Unclassified Excavation	C.Y.	280	$ 30.00	$ 8,400.00
Embankment Construction	C.Y.	89	$ 35.00	$ 3,115.00
Aggregate Base Course (Class 7)	TON	38	$ 50.00	$ 1,900.00
Concrete Ditch Paving	S.Y.	1012	$ 75.00	$ 75,900.00
30" Reinforced Concrete Pipe Culvert, Class III	L.F.	180	$ 178.00	$ 32,040.00
36" Reinforced Concrete Pipe Culvert, Class III	L.F.	1150	$ 252.00	$ 289,800.00
42" Reinforced Concrete Pipe Culvert, Class III	L.F.	1130	$ 303.00	$ 342,390.00
48" Reinforced Concrete Pipe Culvert, Class III	L.F.	200	$ 380.00	$ 76,000.00
4' x 8' Reinforced Concrete Box Culvert (440')	S.F.	1760	$ 185.00	$ 325,600.00
48" Reinforced Concrete Flared End Section	Each	2	$ 5,000.00	$ 10,000.00
Drop Inlets	Each	14	$ 9,000.00	$ 126,000.00
Asphalt Pavement Repair	S.Y.	265	$ 200.00	$ 53,000.00
Pipe Embedment	C.Y.	587	$ 60.00	$ 35,220.00
Site Preparation (10%)	L.S.	1	$ 203,922.00	$ 203,922.00
Traffic Control (1%)	L.S.	1	$ 20,537.00	$ 20,537.00
Erosion Control (3%)	L.S.	1	$ 61,644.00	$ 61,644.00
Contingency (20%)	L.S.	1	$ 411,590.00	$ 411,590.00
Total Estimated Construction Cost				$ 2,077,058.00
Additional Associated Costs				
Utility Relocation (10%)	L.S.	1	$ 207,706.00	$ 207,706.00
Engineering and Survey Fee (18%)	L.S.	1	$ 373,870.00	$ 373,870.00
RW Acquisition and Easements (2%)	L.S.	1	$ 41,541.00	$ 41,541.00
Total Estimated Project Cost				$ 2,700,200.00

Appendix F

Phase 2

Midland and Hilldale Roads at Owen Creek Improvements

Comprehensive Drainage Master Plan

City of Bryant

Phase 2

Midland Road and Hilldale Road at Owen Creek Improvements

Prepared by:

GARVER

4701 Northshore Drive

North Little Rock, Arkansas 72118

January 2025

Garver Project No.: 20T20090

Table of Contents

Appendices

List of Figures

List of Tables

1.0 Overall Project Description

A Comprehensive Drainage Master Plan (CDMP) is being developed for the City of Bryant. The purpose of the City of Bryant CDMP is to:

- Evaluate the existing drainage conditions of the City and Extra-Territorial Jurisdiction (ETJ), also known as the planning area;
- Identify current and future drainage problems;
- Generate proposed solutions to identified problems;
- Develop a Capital Improvement Plan (CIP); and
- Provide tools for managing future development.

The CDMP project is being performed in two (2) phases. Phases 1 and 2 will be divided into major tasks, with subtasks listed as applicable below these major tasks. **Figure 1** shows a flow chart of the overall project process.

- Phase 1: Data Collection and Initial Drainage Study Screening
- Phase 2: Survey Collection, Hydrologic and Hydraulic Modeling, Identification of Drainage Problems, Alternative Development, and CIP Development

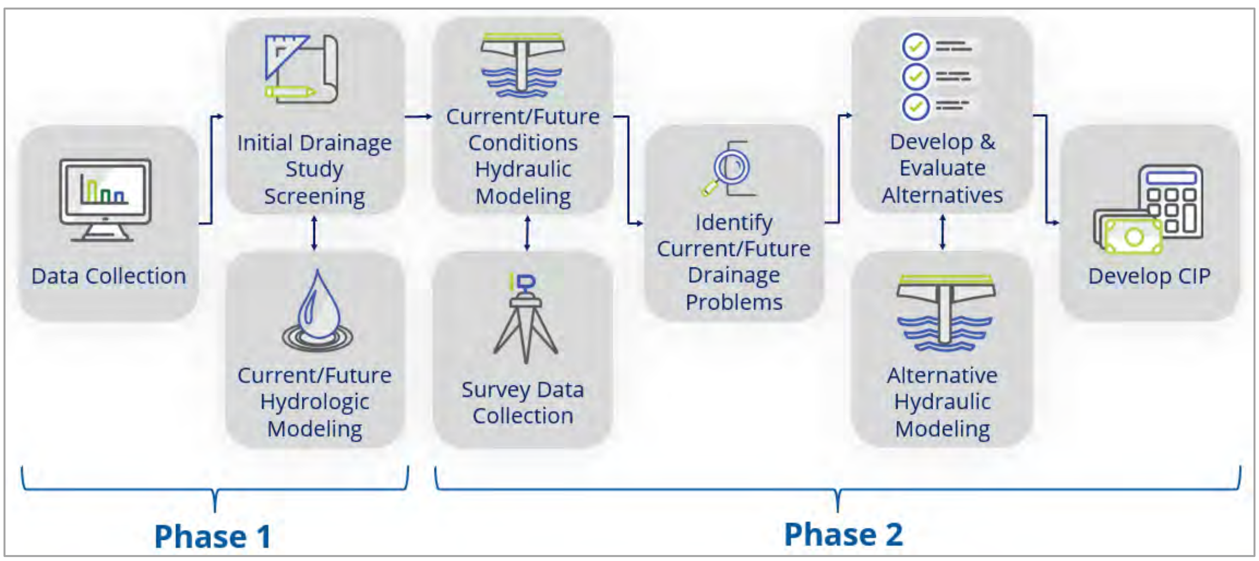


Figure 1. CDMP Project Process

This report discusses the processes and findings of a Phase 2 study for Midland Road and Hilldale Road at Owen Creek.

2.0 General Information

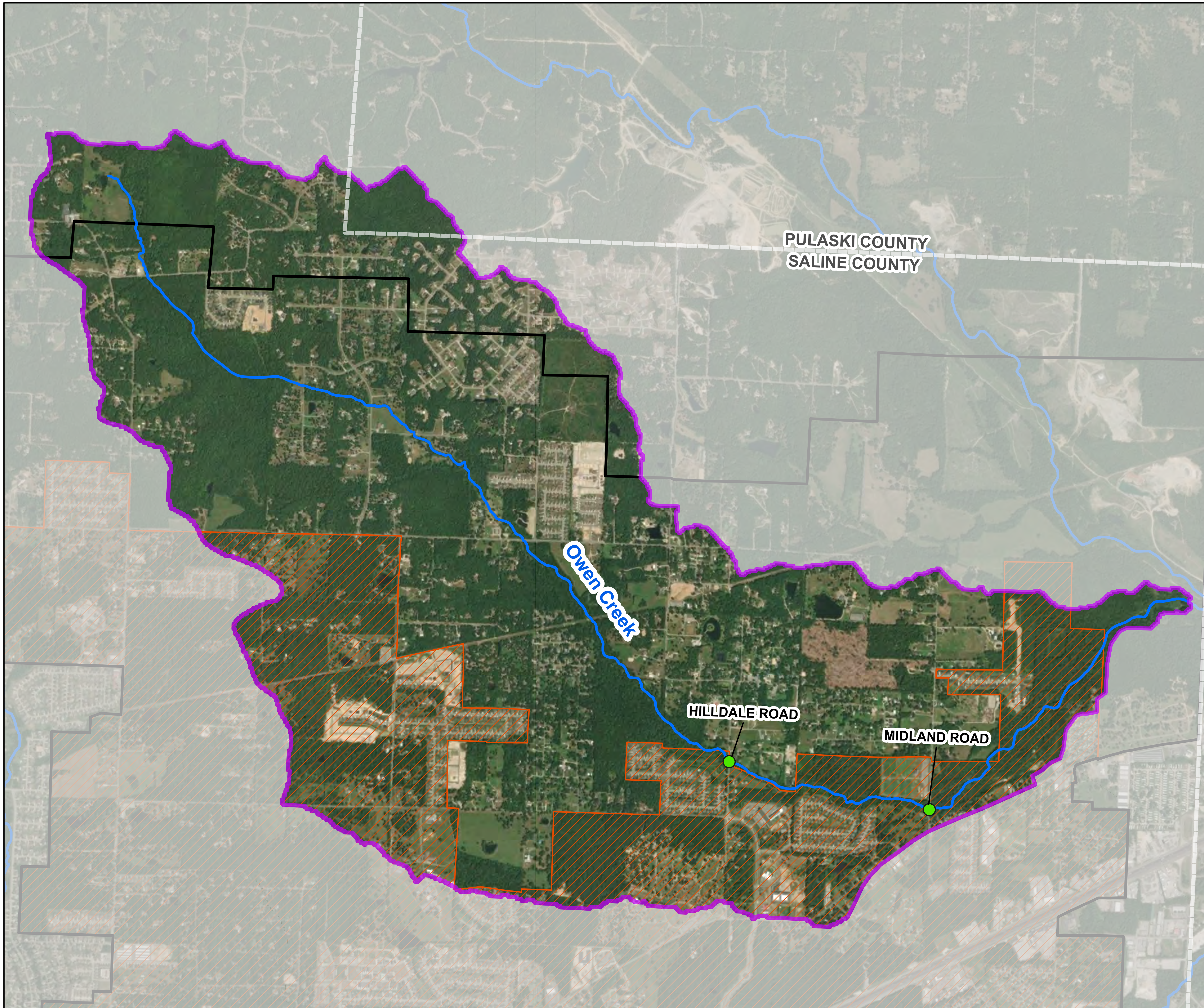
Midland Road is a minor arterial class roadway in the City of Bryant connecting Highway 5 to Hilldale Road. Midland Road crosses Owen Creek near the Midland Soccer Complex. Hilldale Road is a minor arterial class roadway connecting Midland Road to Springdale Road. Hilldale Road crosses Owen Creek near Parkway Elementary School. The project location map is shown in **Figure 2**.

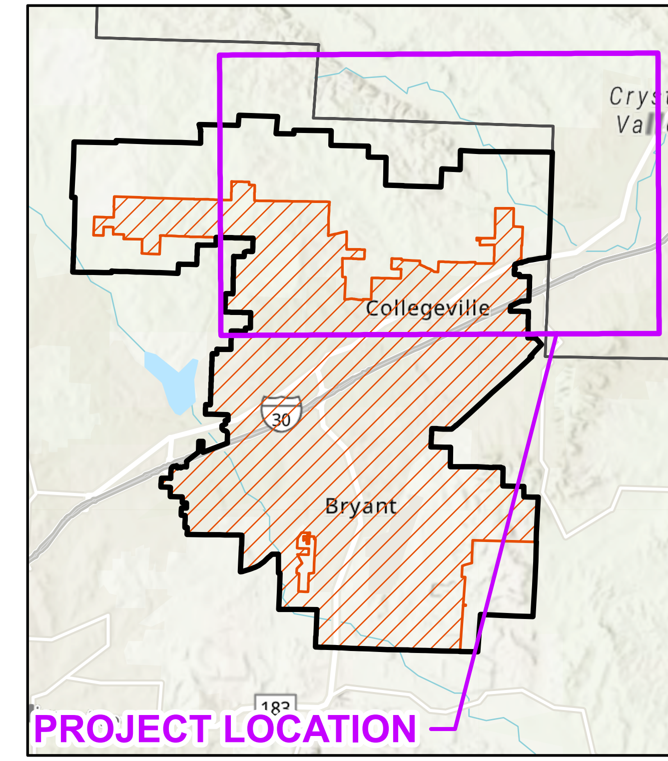
3.0 National Flood Insurance Program (NFIP) Data

The City of Bryant participates in the FEMA National Flood Insurance Program (NFIP). Current floodplain information and mapping is available in Flood Insurance Study (FIS) Report numbers 05125CV0001B and V0002B for Saline County, Arkansas, and Incorporated Areas. The City is mapped within Flood Insurance Rate Map (FIRM) Panels 0225E, 0240E, 0360E, 0370E, and 0380E. The project area of Midland Road and Hilldale Road at Owen Creek is within FIRM Panel 0240E.

Owen Creek is mapped as Zone AE with floodway. The Effective floodplain mapping for the project area is shown in **Figure 3**.

FIGURE 2.
PROJECT LOCATION MAP





Legend

- PROJECT LOCATION
- STREAMS
- BRYANT PLANNING AREA
- BRYANT CITY LIMITS

N
W E
S

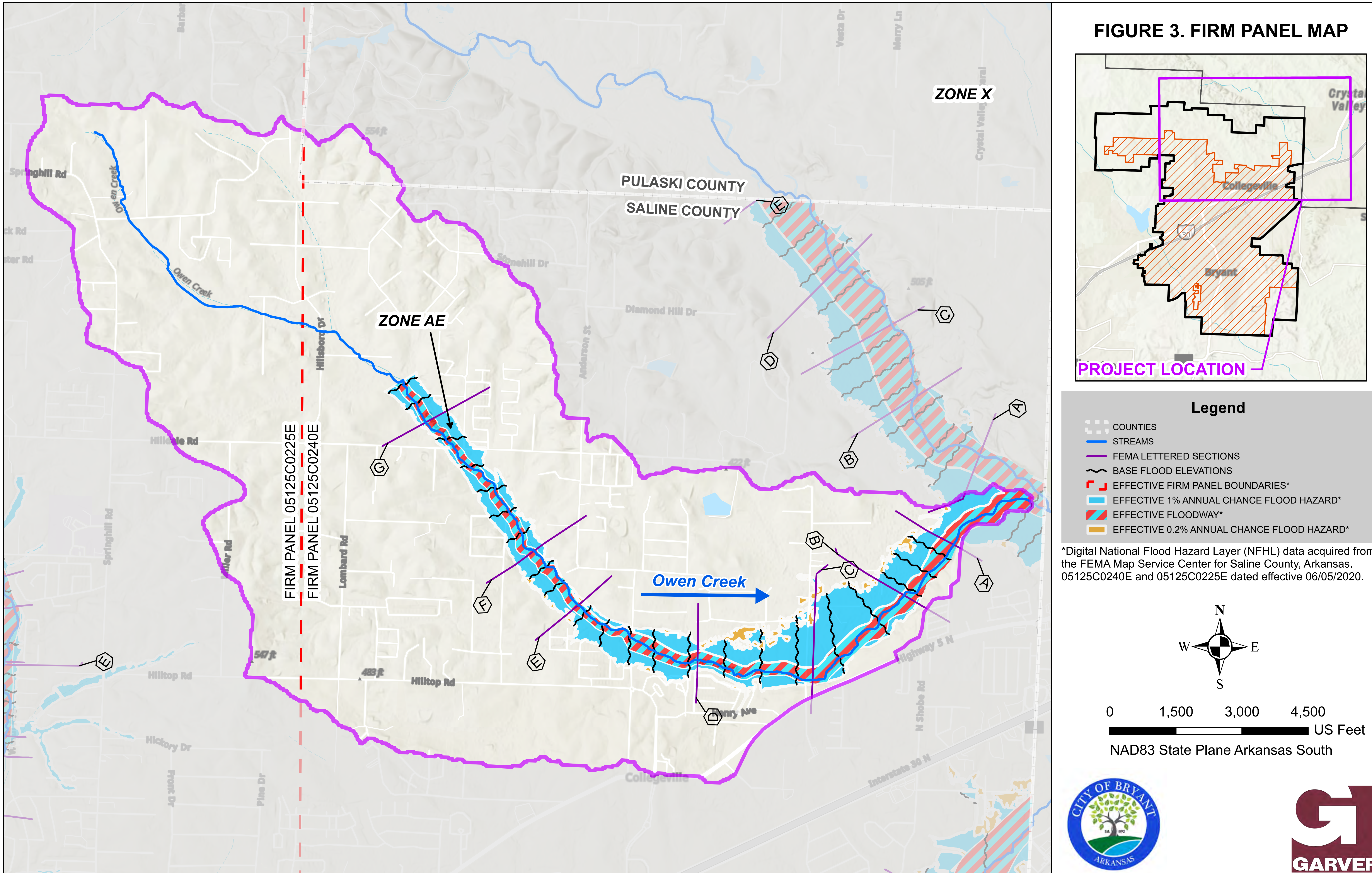
0 1,500 3,000 4,500 US Feet

NAD83 State Plane Arkansas South

CITY OF BRYANT ARKANSAS

GARVER

FIGURE 3. FIRM PANEL MAP



*Digital National Flood Hazard Layer (NFHL) data acquired from the FEMA Map Service Center for Saline County, Arkansas. 05125C0240E and 05125C0225E dated effective 06/05/2020.

CITY OF BRYANT ARKANSAS

GARVER

4.0 Data Collection

4.1 GIS and Topographic Data

For this project, 1-meter Digital Elevation Model (DEM) lidar topography from USGS Ouachita study was acquired from the Arkansas GIS Office. Survey was collected along Owen Creek by Garnat; survey included hydraulic cross sections as well as structure data. Photos of Hilldale Road and Midland Road are given in **Figure 4** and **Figure 5**, respectively.

Figure 4. Hilldale Road at Owen Creek

Figure 5. Midland Road at Owen Creek

4.2 Historical Records of Drainage and Flooding

4.2.1 City and Public News Records

The City has documented one flood event in 2019 along Midland Road and Hilldale Road. This event involved overtopping of the roadway in the vicinity of the Owen Creek bridge at Midland Road and the bridge located at Hilldale Road. Table 1 lists the documented event and the estimated rainfall amount.

Table 1. Major Flood Event along Midland Road and Hilldale Road at Owen Creek

Date	Total Event Precipitation (in)*
April 18, 2019	5.44

**Total event precipitation from NOAA weather station at Adams Field at Little Rock National Airport.*

4.2.2 Resident Comment Database

For this CDMP, a public comment period was issued to allow city residents to submit drainage issues. The comment period ran from April 10 to May 22, 2022. A total of 264 comments were received for the city planning area. 17 comments were within the Owen Creek Drainage Basin**.** Two resident comments were received for Owen Creek near the project area for Hilldale Road. Both comments mention water over the roadway during flood events.

5.0 Initial Screening Study

During Phase 1, an Initial Screening Study was performed for the Owen Creek basin. For this screening, a hydraulic model was developed for the entire basin using 2D HEC-RAS and utilized rain-on-grid methodology to apply precipitation directly to the ground surface. This model was used to identify flood issues throughout the City, so is considered a qualitative model and not to be used for design. However, the data is useful in determining relative flood risk, and a flood severity index (FSI) was developed using the model results. Flood severity ranges from 0 to 4, with 4 being the most severe. The FSI classifications are listed in **Table 2**. **Table 3** displays the FSI rankings for Owen Creek.

Table 2. Flood Severity Index Classes

Class	Description	Maximum Flood Depth (ft)	Maximum Flood Velocity (ft/s)
FS0	Minimal severity	< 0.5	-
FS1	Unsafe for vehicles and pedestrians	< 1.5	< 6.0
FS2	Moderate flooding hazard for buildings	< 3	< 6.0
FS3	Potential for structural damage	> 3	< 6.0
FS4	Unsafe for vehicles and pedestrians; Potential for structural damage	> 0.5	>6.0

Because of the high likelihood of flooding at multiple storm events, and historical flood issues in the area, Midland Road and Hilldale Road were selected for further hydraulic study in order to identify conceptual drainage improvements.

Table 3. Flood Severity Index for Owen Creek Model Area

Location	Stream Name	Basin	Potential Drainage Issue	Flood Severity Index			
				5 yr	10 yr	50 yr	100 yr
Midland Road	Owen Creek	Owen Creek	Roadway overtopping; home flooding	0	0	1	1
Hilldale Road	Owen Creek	Owen Creek	Roadway overtopping; home flooding	1	2	2	2

6.0 Hydrology

In Phase 1 of the CDMP, an Effective hydrologic model of the Owen Creek basin was updated using HEC-HMS 4.10. Flows calculated in the HEC-HMS model were compared to those published in the Effective FIS Report for Owen Creek. Published flows for the 1% AEP were on average about 22% greater than Effective flows. All published flows were less than those calculated in the HEC-HMS model. Differences in calculated and published values are most likely due to a combination of reasons, including significant development in the drainage basin since the original calculations were performed and changes in calculation methodologies between HEC-1 and HEC-HMS. For this project, HEC-HMS flows were utilized.

A summary of the updated flow rates are provided in **Table 4**.

Table 4. Summary of Discharges for Owen Creek

Location along Stream	Drainage Area (sq mi)	Flow Rate (cfs)						
		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
Just downstream of Hillsboro Road	1.45	841	1,170	1,454	1,846	2,147	2,450	3,127
At Hilldale Road (E-W)/ Midland Road	2.46	1,075	1,508	1,909	2,491	2,956	3,424	4,480
Just upstream of Owen Creek Tributary	3.12	1,118	1,600	2,023	2,640	3,131	3,666	4,894
Just downstream of Owen Creek Tributary	4.37	1,817	2,563	3,207	4,162	4,887	5,627	7,375
At Hilldale Road (N-S)	4.54	1,864	2,615	3,263	4,223	4,954	5,732	7,512
At Midland Road	5.26	2,162	2,948	3,552	4,451	5,174	5,924	7,872

7.0 Hydraulics

The hydraulic analysis was performed using HEC-RAS version 6.3.1. The Effective model received from FEMA was utilized and updated as needed.

The 2-, 5-, 10-, 25-, 50-, 100-, and 500-year flows obtained from the HEC-HMS model discussed above were used in the model. The downstream boundary condition was set to a normal depth slope of 0.004 ft/ft. The slope was determined based on the average slope of the thalweg in the downstream portion of the modeled reach.

7.1 Duplicate Effective Model

The received Effective model was brought into HEC-RAS v6.3.1 and run as the Duplicate Effective Model (DEM).

7.2 Existing Conditions Model

The Effective FEMA model was utilized and updated in order to represent the current conditions of the project area. Parameters such as reach lengths, ineffective area settings, and bank stations were updated were necessary. Existing conditions structure data for Hilldale Road and Midland Road are given in Table 5 and Table 6. The existing structures at both roadways overtop, with Hilldale Road overtopping at the 2-year and Midland Road overtopping at the 5-year event.

Table 5. Existing Hilldale Road (North-South) Structure Data

Parameter	Value
Bridge Configuration	2 @ 18.67' (37.34 total feet)
Pier Type and Size	1.9'-3' tapered square nose pier with 7' with square base
Abutment Type	1:3 H:V
Minimum Top of Road within Floodplain	360.03 ft NAVD88
Open Flow Area	213 sq. ft

Table 6. Existing Midland Road Structure Data

Parameter	Value
Bridge Configuration	1 @ 33.2', 1 @ 30.94', 1 @ 31.14' (95.28 total feet)
Pier Type and Size	2'-6" square nosed piers
Abutment Type	Vertical
Minimum Top of Road within Floodplain	338.46 ft NAVD88
Open Flow Area	643 sq. ft

7.3 Proposed Conditions

Based on the existing conditions results, drainage improvements were iterated to upsize the bridges at both Hilldale Road and Midland Road. After multiple iterations, a design was developed to convey the 25-year event storm without overtopping the roadway. Parameters for the proposed structure updates are provided in Table 7 and Table 8.

Table 7. Proposed Hilldale Road N-S. Structure Data

Parameter	Value
Bridge Configuration	3 spans at 150 total feet
Pier Type and Size	1'-6" square nosed piers
Abutment Type	1:2 H:V
Minimum Top of Road within Floodplain	359.87 ft NAVD88
Open Flow Area	774 sq. ft

Table 8. Proposed Midland Road Structure Data

Parameter	Value
Bridge Configuration	5 spans at 325 total feet
Pier Type and Size	1'-6" square nosed piers
Abutment Type	1:2 H:V
Minimum Top of Road within Floodplain	338.36 ft NAVD88
Open Flow Area	1,698 sq. ft

A comparison of existing and proposed water surface elevations during the 25-year event is given in **Table 9.** The model layout and floodplain boundaries for the 25-yr event are shown in **Figure 6**.

Table 9. Comparison of Existing and Proposed WSELs for 25-year event

Model Cross Section	Existing Conditions WSEL (ft NAVD88)	Proposed Conditions WSEL (ft NAVD88)	Difference in WSEL (ft)
20444.08	411.45	411.45	0.00
19815	407.65	407.65	0.00
19337	402.69	402.69	0.00
18728	400.99	400.99	0.00
18484	400.33	400.33	0.00
18411	Hilldale Road E-W		
18339	398.97	398.97	0.00
18111	397.63	397.63	0.00
17711	394.00	394.00	0.00
17138	390.61	390.61	0.00
16589	386.74	386.74	0.00

Model Cross Section	Existing Conditions WSEL (ft NAVD88)	Proposed Conditions WSEL (ft NAVD88)	Difference in WSEL (ft)
16169	383.99	383.99	0.00
15670	381.56	381.56	0.00
15200	378.66	378.66	0.00
14532	374.68	374.68	0.00
13945	371.85	371.85	0.00
13450	367.55	367.55	0.00
12949	365.24	365.27	-0.03
12454	362.42	362.36	0.06
11870	361.84	361.40	0.44
11819	Hilldale Road N-S		
11767	358.99	359.31	-0.32
11252	356.65	356.65	0.00
10868	355.43	355.43	0.00
10146	352.61	352.61	0.00
9648	348.80	348.80	0.00
9202	346.43	346.43	0.00
8682	343.96	343.96	0.00
8097	340.30	340.30	0.00
7571	339.46	339.46	0.00
7461	Midland Road		
7351	337.03	337.03	0.00
6796	335.45	335.45	0.00
6181	333.46	333.46	0.00
5547	331.67	331.67	0.00
4802	328.82	328.82	0.00
4145	326.76	326.76	0.00
3454	324.74	324.74	0.00
2889	323.18	323.18	0.00
2383	321.58	321.58	0.00

8.0 Conceptual Layout and Planning Level Opinion of Project Costs

A conceptual layout drawing and planning level opinion of project costs are provided in Appendix F-1. This layout is for graphical and planning purposes only and is not for construction.

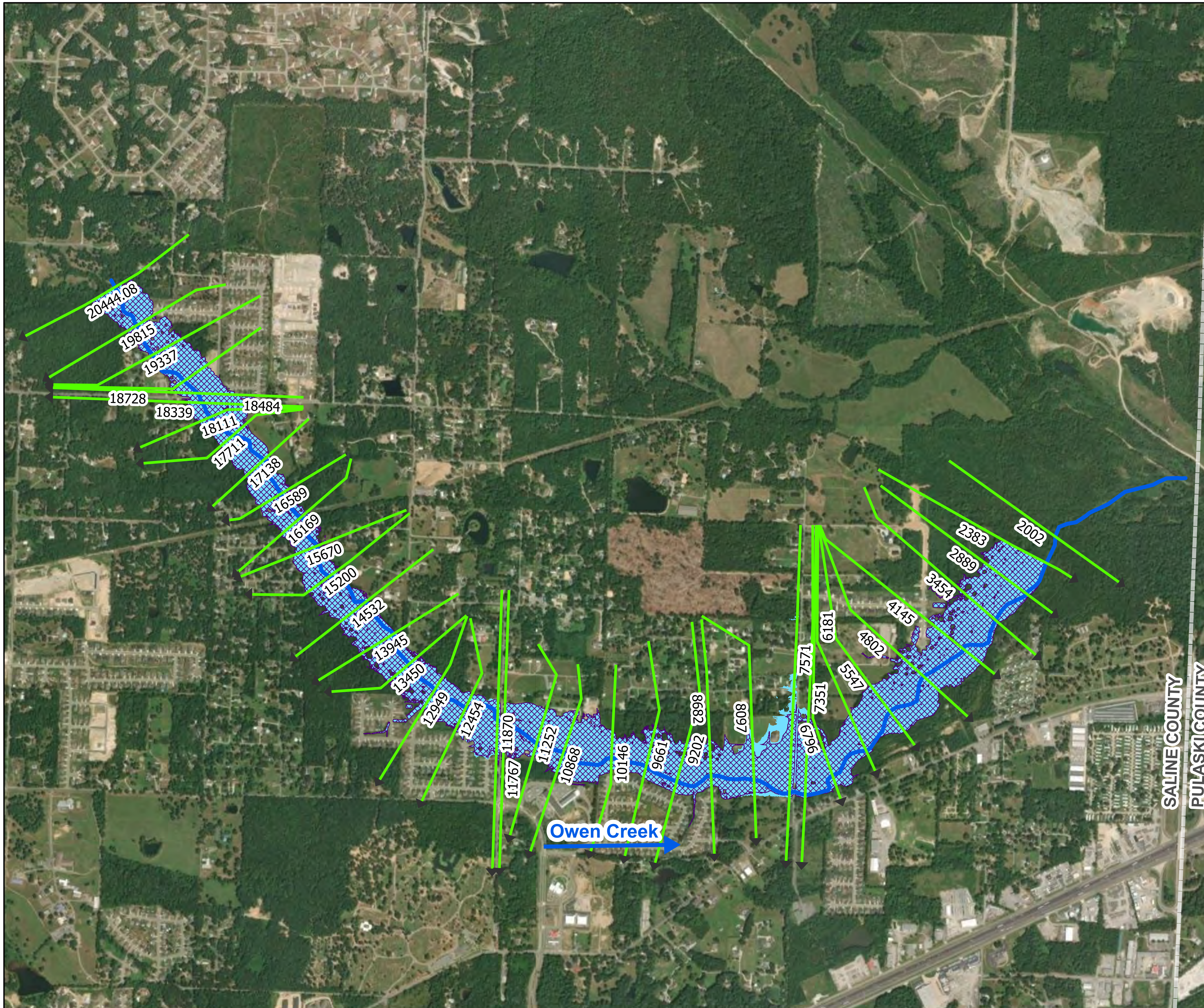
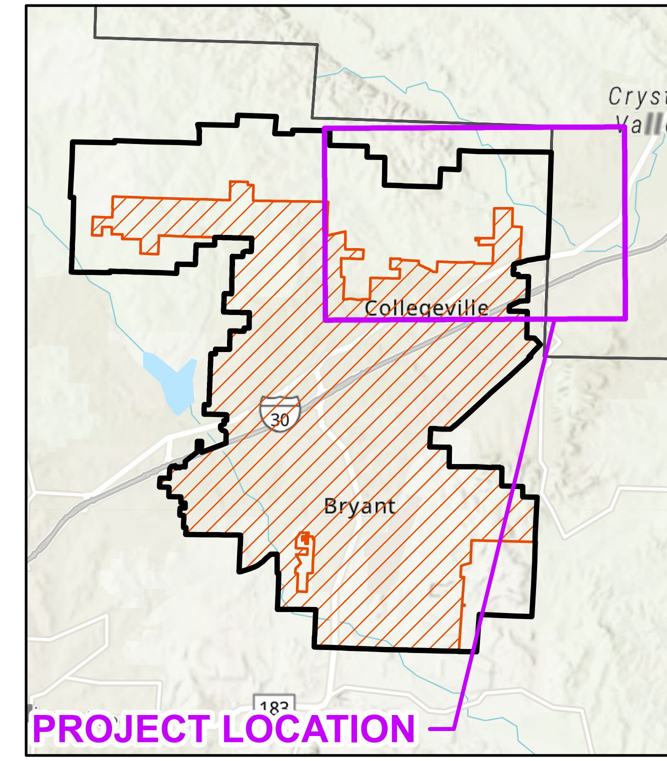


FIGURE 6.
MODEL LAYOUT MAP



Legend

- CROSS SECTIONS
- STREAM
- PROPOSED 25-YEAR FLOODPLAIN
- EXISTING 25-YEAR FLOODPLAIN
- COUNTIES

N
W E
S

0 1,000 2,000 3,000 US Feet
NAD83 State Plane Arkansas South

CITY OF BRYANT
ARKANSAS

GARVER

Appendix F-1

Phase 2

Midland and Hilldale Roads at Owen Creek Improvements

Conceptual Layout and

Planning Level Opinion of Project Costs

CITY OF BRYANT
BRYANT, ARKANSAS
OWEN CREEK
AT MIDLAND ROAD
CONCEPT LAYOUT
GARVER
Legend
Reconstruction Extents
0
100
200
300
Feet
NAD83 State Plane Arkansas North
N
S
E
W
TIE INTO ROADWAY ELEVATION AT 340.36'
CONSTRUCT 325' BRIDGE
OWEN CREEK
TIE INTO ROADWAY ELEVATION AT 344.77'
MIDLAND RD.
HIGHWAY 5 N.

CITY OF BRYANT
BRYANT, ARKANSAS
OWEN CREEK
AT HILLDALE ROAD
CONCEPT LAYOUT
GARVER
Legend
Reconstruction Extents
0
100
200
300
Feet
NAD83 State Plane Arkansas South
N
E
S
W
OWEN CREEK
BLUE BILL LN.
CONSTRUCT 150' BRIDGE
RAISE ELEVATION TO 364.25'
HILLDALE RD.
GLENN CV.
NOT FOR CONSTRUCTION

Planning Level Opinion of Project Costs Midland Road at Owen Creek Improvements				
Item Description	Unit	Quantity	Unit Cost	Total Cost
Roadway Construction	Mile	0.04	$ 5,000,000.00	$ 200,000.00
Owen Creek Bridge (28' x 325')	S.F.	8450	$ 340.00	$ 2,873,000.00
Driveway Repair	S.Y.	280	$ 140.00	$ 39,200.00
Site Preparation (10%)	L.S.	1	$ 460,099.00	$ 460,099.00
Traffic Control (1%)	L.S.	1	$ 46,337.00	$ 46,337.00
Erosion Control (3%)	L.S.	1	$ 139,085.00	$ 139,085.00
Contingency (20%)	L.S.	1	$ 928,653.00	$ 928,653.00
Total Estimated Construction Cost				$ 4,686,374.00
Additional Associated Costs				
Utility Relocation (10%)	L.S.	1	$ 468,637.00	$ 468,637.00
Engineering and Survey Fee (18%)	L.S.	1	$ 843,547.00	$ 843,547.00
RW Acquisition and Easements (2%)	L.S.	1	$ 93,727.00	$ 93,727.00
Total Estimated Project Cost				$ 6,092,300.00

Planning Level Opinion of Project Costs Hilldale Road at Owen Creek Improvements				
Item Description	Unit	Quantity	Unit Cost	Total Cost
Roadway Construction	Mile	0.04	$ 5,000,000.00	$ 200,000.00
Owen Creek Bridge (28' x 150')	S.F.	4200	$ 340.00	$ 1,428,000.00
Site Preparation (10%)	L.S.	1	$ 240,679.00	$ 240,679.00
Traffic Control (1%)	L.S.	1	$ 24,239.00	$ 24,239.00
Erosion Control (3%)	L.S.	1	$ 72,756.00	$ 72,756.00
Contingency (20%)	L.S.	1	$ 485,781.00	$ 485,781.00
Total Estimated Construction Cost				$ 2,451,455.00
Additional Associated Costs				
Utility Relocation (10%)	L.S.	1	$ 245,146.00	$ 245,146.00
Engineering and Survey Fee (18%)	L.S.	1	$ 441,262.00	$ 441,262.00
RW Acquisition and Easements (2%)	L.S.	1	$ 49,029.00	$ 49,029.00
Total Estimated Project Cost				$ 3,186,900.00

Appendix G

Phase 2

Hidden Creek Drive and Rodeo Drive at Shoal Creek
Improvements

Comprehensive Drainage Master Plan

City of Bryant

Phase 2

Hidden Creek Drive and Rodeo Drive at Shoal Creek Improvements

Prepared by:

GARVER

4701 Northshore Drive
North Little Rock, Arkansas 72118

January 2025
Garver Project No.: 20T20090

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Appendices

List of Figures

List of Tables

1.0 Overall Project Description

A Comprehensive Drainage Master Plan (CDMP) is being developed for the City of Bryant. The purpose of the City of Bryant CDMP is to:

- Evaluate the existing drainage conditions of the City and Extra-Territorial Jurisdiction (ETJ), also known as the planning area;
- Identify current and future drainage problems;
- Generate proposed solutions to identified problems;
- Develop a Capital Improvement Plan (CIP); and
- Provide tools for managing future development.

The CDMP project is being performed in two (2) phases. Phases 1 and 2 will be divided into major tasks, with subtasks listed as applicable below these major tasks. **Figure 1** shows a flow chart of the overall project process.

- Phase 1: Data Collection and Initial Drainage Study Screening
- Phase 2: Survey Collection, Hydrologic and Hydraulic Modeling, Identification of Drainage Problems, Alternative Development, and CIP Development

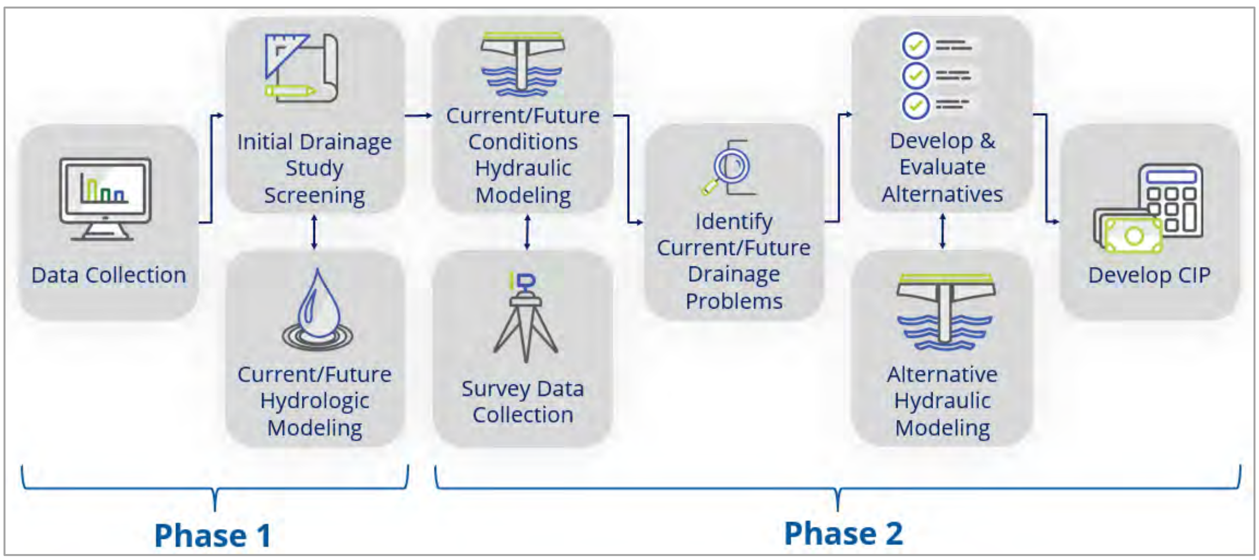


Figure 1. CDMP Project Process

This report discusses the processes and findings of a Phase 2 study of drainage problems along Shoal Creek.

2.0 General Information

Many drainage issues exist along Shoal Creek. Those identified in Phase 1 of the CDMP include the Forest Cove Subdivision, Hidden Creek Drive, and homes along Rodeo Drive. The Forest Cove Subdivision includes several homes and road crossings of Shoal Creek north of Highway 5. Hidden Creek Drive is a local class roadway in the city of Bryant connecting North Prickett Road to Pine Circle with a culvert crossing over Shoal Creek. Shoal Creek is a part of the Hurricane Creek Drainage Basin. The project location map is shown in **Figure 2**.

3.0 National Flood Insurance Program (NFIP) Data

The City of Bryant participates in the FEMA National Flood Insurance Program (NFIP). Current floodplain information and mapping is available in Flood Insurance Study (FIS) Report numbers 05125CV0001B and V0002B for Saline County, Arkansas, and Incorporated Areas. The City is mapped within Flood Insurance Rate Map (FIRM) Panels 0225E, 0240E, 0360E, 0370E, and 0380E. The Hidden Creek Drive and Rodeo Drive are within Panel 0360E.

Currently, Shoal Creek is not mapped stream, so it is generally within Zone X. The Effective floodplain mapping for the project area is shown in **Figure 3**.

FIGURE 2.
PROJECT LOCATION MAP

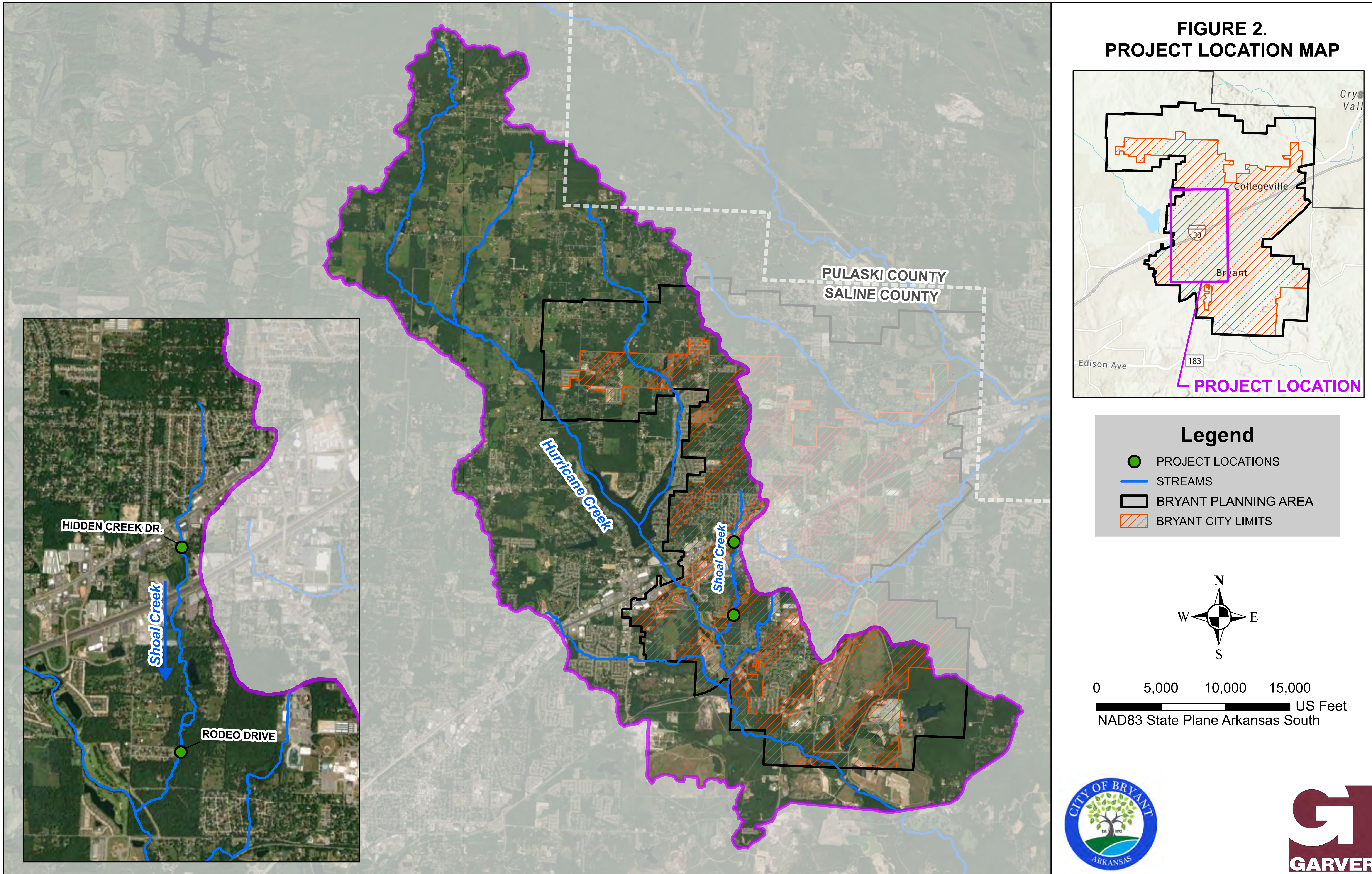
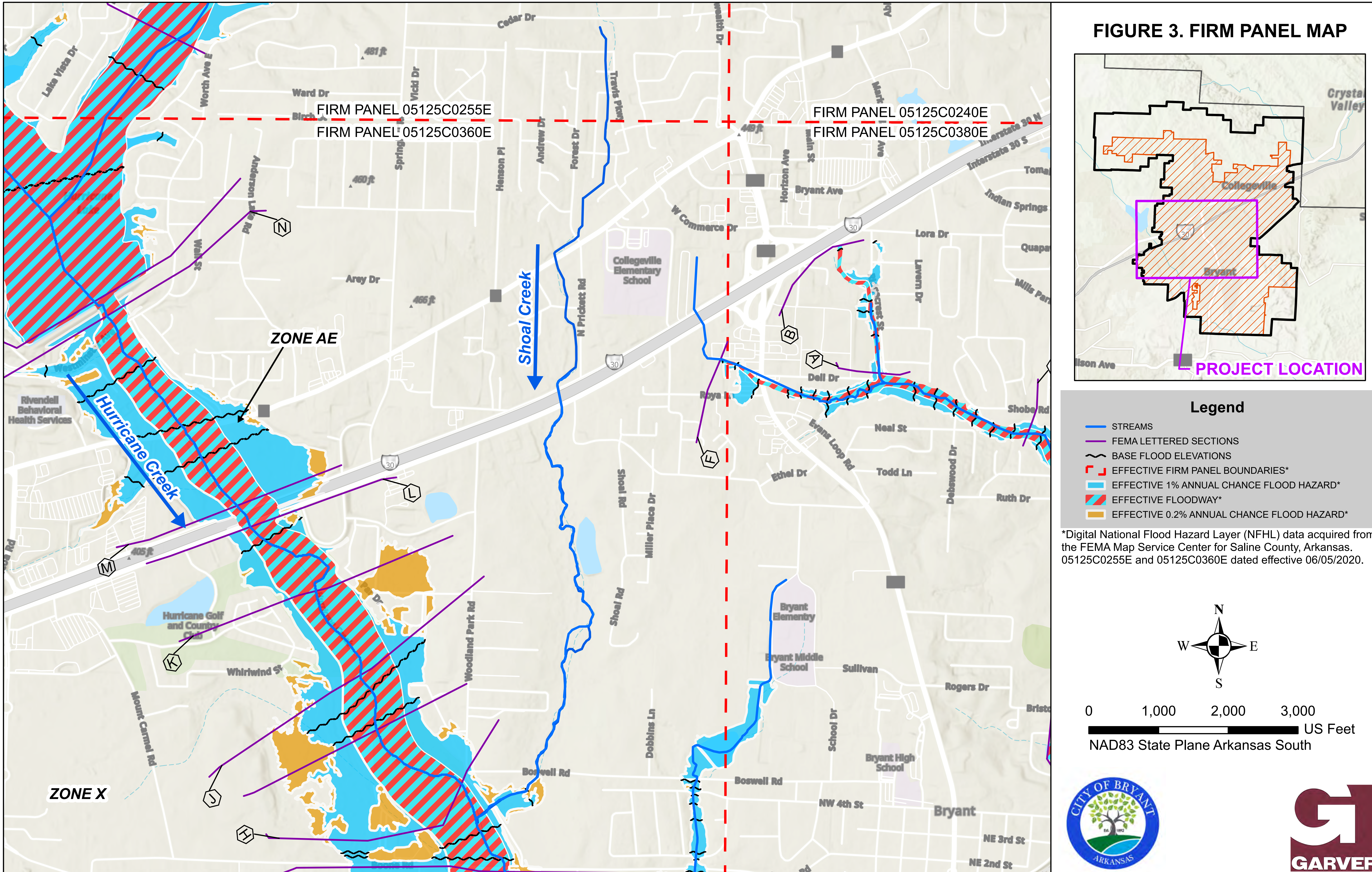


FIGURE 3. FIRM PANEL MAP



4.0 Data Collection

4.1 GIS and Topographic Data

For this project, 1-meter Digital Elevation Model (DEM) lidar topography from USGS Ouachita study was acquired from the Arkansas GIS Office. Garnat collected survey along Shoal Creek, including hydraulic cross sections and bridge and culvert structure data. Shoal Creek within the Forest Cove Subdivision is shown in **Figures 4** through **8**. The Hidden Creek Drive crossing is shown in **Figure 9**. Shoal Creek near Rodeo Drive is shown in **Figure 10**.

Figure 4. Shoal Creek within Forest Cove Subdivision

Figure 5. Travis Parkway at Shoal Creek

Figure 6. Jennifer Cove at Shoal Creek

Figure 7. Evening Shade Drive at Shoal Creek

Figure 8. Ashley Place Drive at Shoal Creek

Figure 9. Hidden Creek Drive at Shoal Creek

Figure 10. Shoal Creek near Rodeo Drive

4.2 Resident Comment Database

For this CDMP, a public comment period was issued to allow city residents to submit drainage issues. The comment period ran from April 10 to May 22, 2022. A total of 264 comments were received for the city planning area. 119 comments were within the Hurricane Creek drainage Basin**.** Ten resident comments were received for the Forest Cove neighborhood. Three resident comments were received for Shoal Creek for the project location near Hidden Creek Drive and one comment was received for the project location near Rodeo Drive. The resident comment locations are provided in **Figure 11**.

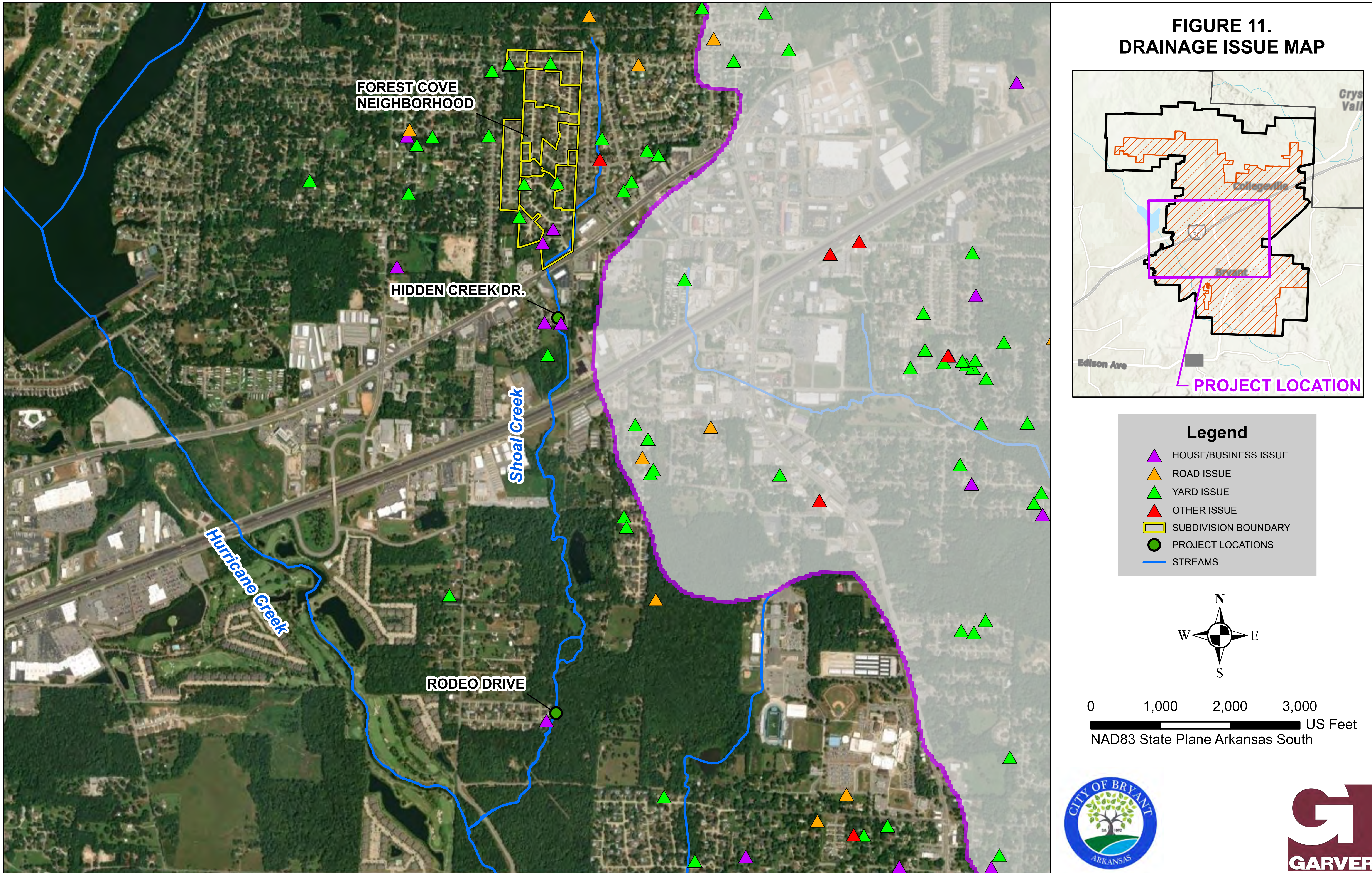


FIGURE 11.
DRAINAGE ISSUE MAP

5.0 Initial Screening Study

During Phase 1, an Initial Screening Study was performed for the Hurricane Creek Basin. For this screening, a hydraulic model was developed for the entire basin using 2D HEC-RAS and utilized rain-on-grid methodology to apply precipitation directly to the ground surface. This model was used to identify flood issues throughout the City, so is considered a qualitative model and not to be used for design. However, the data is useful in determining relative flood risk, and a flood severity index (FSI) was developed using the model results. Flood severity ranges from 0 to 4, with 4 being the most severe. The FSI classifications are listed in **Table 1**. **Table 2** displays the FSI rankings for Shoal Creek.

Table 1. Flood Severity Index Classes

Class	Description	Maximum Flood Depth (ft)	Maximum Flood Velocity (ft/s)
FS0	Minimal severity	< 0.5	-
FS1	Unsafe for vehicles and pedestrians	< 1.5	< 6.0
FS2	Moderate flooding hazard for buildings	< 3	< 6.0
FS3	Potential for structural damage	> 3	< 6.0
FS4	Unsafe for vehicles and pedestrians; Potential for structural damage	> 0.5	>6.0

Table 2. Flood Severity Index for Shoal Creek

Location	Stream Name	Basin	Potential Drainage Issue	Flood Severity Index				Resident Comments
				5 yr	10 yr	50 yr	100 yr	
Forest Cove/Sunset Meadows	Shoal Creek	Hurricane Creek	Neighborhood flooding	1	1	2	2	10

Location	Stream Name	Basin	Potential Drainage Issue	Flood Severity Index				Resident Comments
				5 yr	10 yr	50 yr	100 yr	
Hidden Creek Drive	Shoal Creek	Hurricane Creek	Roadway overtopping; home flooding	1	1	2	2	3
Rodeo Drive	Shoal Creek	Hurricane Creek	Home flooding	1	2	2	2	1

Because of the high likelihood of flooding at multiple storm events, Forest Cove, Hidden Creek Drive, and Rodeo Drive were selected for further hydraulic study in order to identify conceptual drainage improvements.

6.0 Hydrology

In Phase 1 of the CDMP, a hydrologic model of the Hurricane Creek basin was created using HEC-HMS 4.10. The Shoal Creek drainage basin was broken up so that multiple drainage points along the creek could be analyzed. The determined flow rates for Shoal Creek are provided in **Table 3**.

Table 3. Summary of Discharges for Shoal Creek

Location along Stream	Drainage Area (sq mi)	Flow Rate (cfs)					
		5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
Upstream of Shoal Creek Tributary	0.6	645	775	950	1081	1210	1494
At Highway 5	0.9	1063	1276	1562	1775	1985	2448
At I-30	1.1	1152	1424	1758	2000	2237	2730
At confluence with Hurricane Creek	1.6	1636	2034	2568	2972	3354	4151

7.0 Hydraulics

The hydraulic analysis was performed using HEC-RAS version 6.3.1. Because the project area is mapped as Zone X, no effective FEMA model exists. Therefore, a new hydraulic model was created for the project.

The 5-, 10-, 25-, 50-, 100-, and 500-year flows obtained from the HEC-HMS model discussed above were used in the models. The downstream boundary condition was set to a normal depth slope of 0.0005 ft/ft. The slope was determined based on the average slope of the thalweg in the downstream portion of the modeled reach.

7.1 Existing Conditions

RAS Mapper was utilized to create the stream centerline, flowpaths, and cross sections for the model. Cross sections were located and oriented as required for proper hydraulic modeling of the floodplain. Cross section geometry data was updated with survey data where appropriate. The model limits were from approximately 120 feet downstream of Cedar Drive to the confluence with Hurricane Creek.

Cross section geometry was taken from 1-meter (DEM) lidar topography and project survey. Manning's *n* values in the model were determined based on aerial imagery and site visit information. Ineffective areas due to structures were set based on roadway elevations per the ArDOT Drainage Manual.

7.1.1 Forest Cove Subdivision

Four roads cross Shoal Creek within Forest Cove Subdivision: Travis Parkway, Jennifer Cove, Evening Shade Drive, and Ashley Place Drive. Several documented flood events have occurred in this neighborhood, with yard flooding and roadway overtopping occurring almost yearly.

7.1.2 Hidden Creek Drive

Existing structure data for the stream crossing at Hidden Creek Drive was determined from project survey. Parameters for the existing structure are given in Table 4.

Table 4. Existing Hidden Creek Drive Structure Data

Parameter	Value
Culvert Size	3- 10x6 RCB
Upstream Invert Elevation	399.65’, 399.66’, 399.73’
Downstream Invert Elevation	399.3’5, 399.5’4, 399.60’
Culvert Length	38 feet
Minimum Top of Road within Floodplain	405.65 ft NAVD88
Open Flow Area	180 sq. ft

In existing conditions, Hidden Creek Drive overtops during all modeled flood events (5-year through 500-year).

7.1.3 Rodeo Drive

There are no crossing structures that exist at Rodeo Drive. The main concern is the existing homes in the 100-year floodplain. Multiple flood events have been documented for these homes. A desirable design would be to remove the properties from the 100-year floodplain.

7.2 Proposed Conditions

7.2.1 Forest Cove Subdivision

Multiple culvert improvements and ditch improvements were considered within Forest Cove in order to mitigate flooding. After iterating, it was determined that no feasible solution was available to mitigate a significant amount of flooding for any storm event. This is because the existing culvert sizes are the maximum allowed size with the current roadway profile. The roadway profile cannot be raised within significant impacts to properties and driveways. The channel capacity cannot be increased without encroaching into properties. A potential solution to the flooding in this area would involve detention upstream of the subdivision or rerouting of storm sewer so that flow bypasses Forest Cove. Rerouting would not be plausible without significant road and property impacts. No feasible alternative was identified for the CDMP. Additional analysis could be conducted, but after discussions with the City regarding feasible alternatives, Garver was directed to forego further study in this area.

7.2.2 Hidden Creek Drive

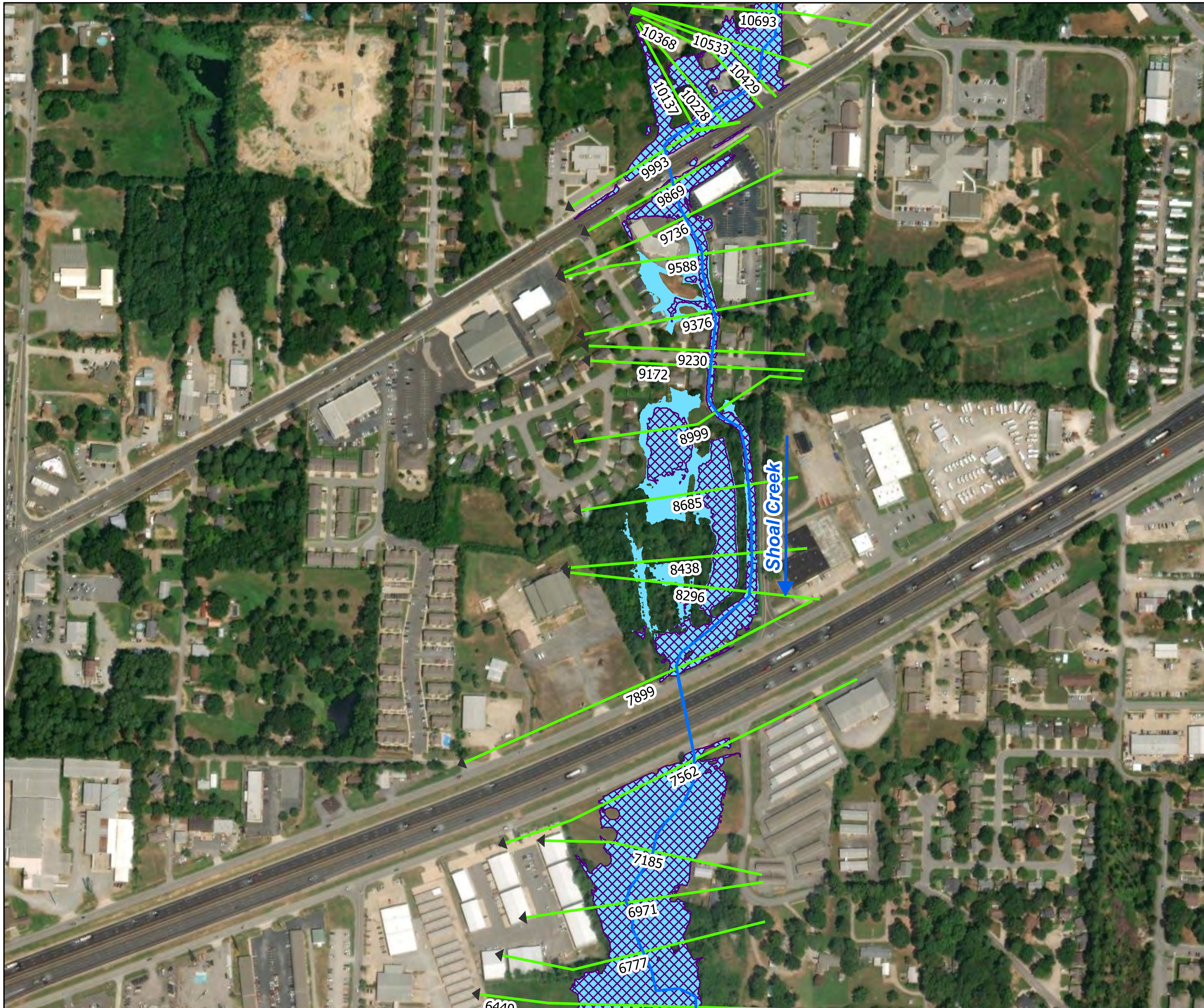
Based on the existing conditions results, drainage improvements were iterated to improve the flooding at Hidden Creek Drive by widening the channel both upstream and downstream of the roadway crossing. After multiple iterations, a design was developed to convey the 10-year event storm without overtopping the roadway.

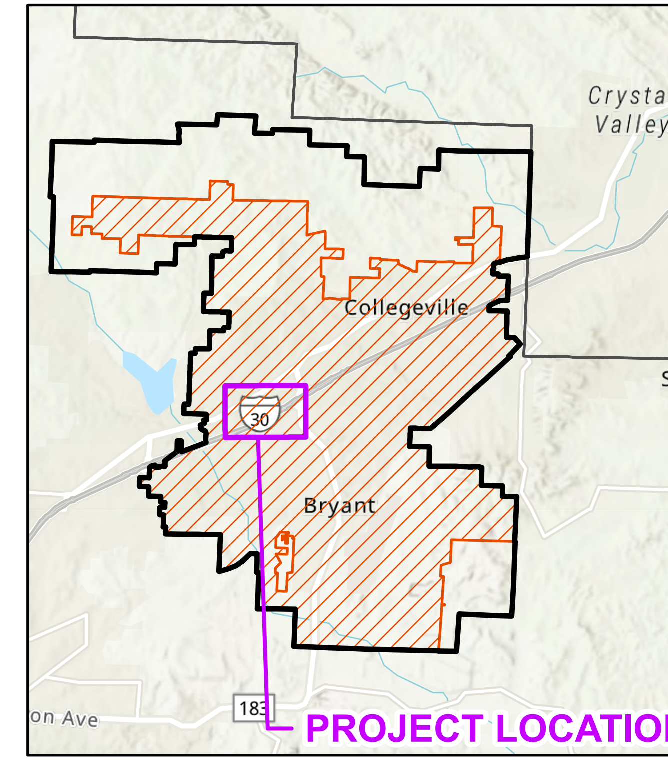
A comparison of existing and proposed water surface elevations during the 10-year event is given in **Table 5**. The existing and proposed floodplain boundaries are shown in **Figure 13**.

Table 5. Comparison of Existing and Proposed WSELs for 10-year event

Model Cross Section	Existing Conditions WSEL (ft NAVD88)	Proposed Conditions WSEL (ft NAVD88)	Difference in WSEL (ft)
10162	413.84	413.84	0.00
10009	413.7	413.7	0.00
9949	Highway 5		
9860	412.66	412.65	-0.01
9761	410.63	410.63	0.00
9579	410.04	407.35	-2.69
9387	407.57	406.74	-0.83
9274	406.46	405.47	-0.99
9227	Hidden Creek Drive		
9180.942	406.13	404.9	-1.23
9024	405.25	403.57	-1.68
8665	404.89	403.2	-1.69
8463	404.19	402.67	-1.52
8321	404.03	402.4	-1.63
7928	401.25	401.69	0.44
7761	Interstate - 30		
7593	399.4	399.4	0.00
7210	398.53	398.53	0.00
9860	413.84	413.84	0.00

FIGURE 12.
HIDDEN CREEK DRIVE MODEL LAYOUT MAP





Legend

- CROSS SECTIONS
- PROPOSED 10-YEAR FLOODPLAIN
- EXISTING 10-YEAR FLOODPLAIN
- STREAMS

N
W E
S

0 250 500 750
US Feet
NAD83 State Plane Arkansas South

CITY OF BRYANT
ARKANSAS

GARVER

7.2.3 Rodeo Drive

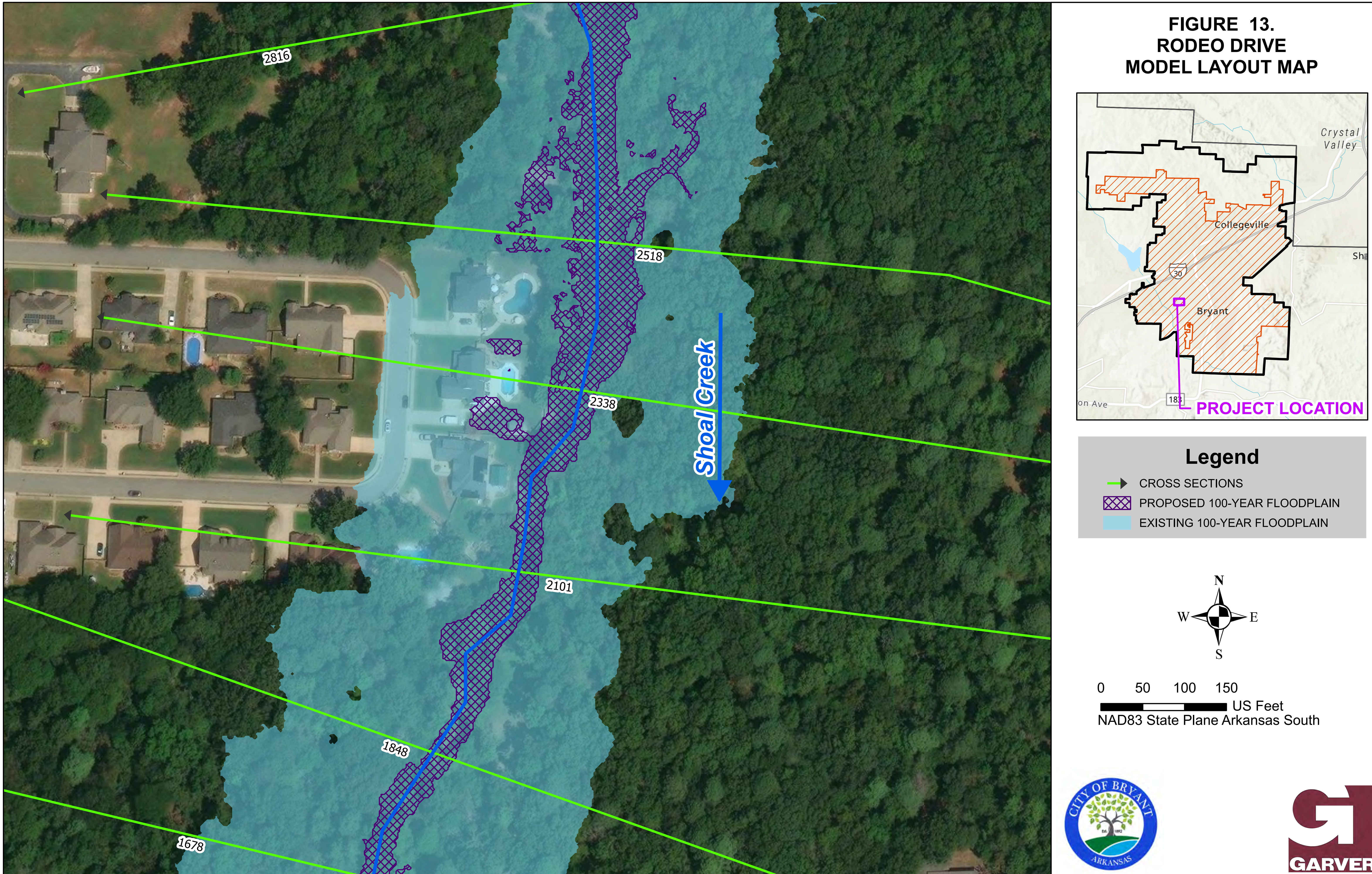
At Rodeo Drive multiple alternatives were iterated in order to improve drainage. One alternative included improving the structures downstream at Boswell Road. It was determined that that improvements downstream would not affect conditions at Rodeo Drive. The only impactful alternative would be to detain flow upstream of Rodeo Drive. Flows were manually edited to determine the amount of flow needed to remove the existing homes from the 100-year floodplain. The detention pond would need to retain a volume of approximately 186 acre-feet. This size of detention pond would require a substantial amount of property.

The existing and proposed floodplain boundaries for Shoal Creek at Rodeo Drive are shown in **Figure 13**.

8.0 Conceptual Layout and Planning Level Opinion of Project Costs

A conceptual layout drawing and planning level opinion of project costs are provided in Appendix G-1. This layout is for graphical and planning purposes only and is not for construction.

FIGURE 13.
RODEO DRIVE
MODEL LAYOUT MAP



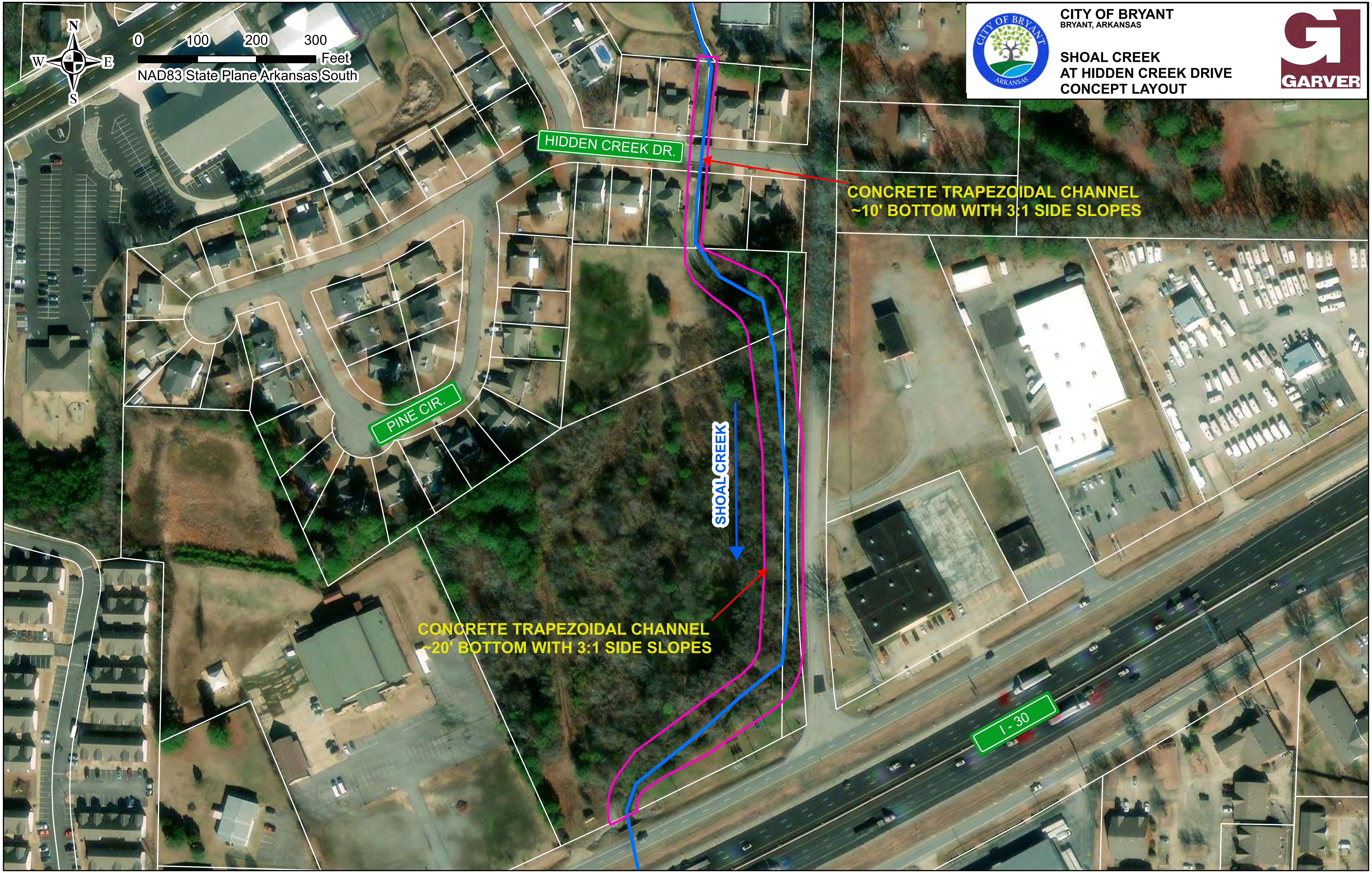
Appendix G-1

Phase 2

Hidden Creek Drive and Rodeo Drive at Shoal Creek Improvements

Conceptual Layout and

Planning Level Opinion of Project Costs


CITY OF BRYANT
BRYANT, ARKANSAS
SHOAL CREEK
AT HIDDEN CREEK DRIVE
CONCEPT LAYOUT
GARVER
CITY OF BRYANT
ARKANSAS
N
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E
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0
100
200
300
Feet
NAD83 State Plane Arkansas South
HIDDEN CREEK DR.
CONCRETE TRAPEZOIDAL CHANNEL
~10' BOTTOM WITH 3:1 SIDE SLOPES
PINE CIR.
SHOAL CREEK
CONCRETE TRAPEZOIDAL CHANNEL
~20' BOTTOM WITH 3:1 SIDE SLOPES
I - 30


CITY OF BRYANT
BRYANT, ARKANSAS
SHOAL CREEK
AT RODEO DRIVE
CONCEPT LAYOUT
GARVER
0 100 200 300
Feet
NAD83 State Plane Arkansas South
N
E
S
W
RODEO DR.
WOODLAND PARK RD.
SHOAL CREEK
APPROXIMATELY 8,116,800 CF OF DETENTION IS NEED TO REMOVE HOMES FROM THE 100YR FLOODPLAIN

Planning Level Opinion of Project Costs Hidden Creek Drive at Shoal Creek Improvements				
Item Description	Unit	Quantity	Unit Cost	Total Cost
Unclassified Excavation	C.Y.	5200	$ 30.00	$ 156,000.00
Concrete Ditch Paving	S.Y.	11400	$ 75.00	$ 855,000.00
Site Preparation (10%)	L.S.	1	$ 149,464.00	$ 149,464.00
Traffic Control (1%)	L.S.	1	$ 15,053.00	$ 15,053.00
Erosion Control (3%)	L.S.	1	$ 45,182.00	$ 45,182.00
Contingency (20%)	L.S.	1	$ 301,674.00	$ 301,674.00
Total Estimated Construction Cost				$ 1,522,373.00
Additional Associated Costs				
Utility Relocation (10%)	L.S.	1	$ 152,237.00	$ 152,237.00
Engineering and Survey Fee (18%)	L.S.	1	$ 274,027.00	$ 274,027.00
RW Acquisition and Easements (2%)	L.S.	1	$ 30,447.00	$ 30,447.00
Total Estimated Project Cost				$ 1,979,100.00

Planning Level Opinion of Project Costs Rodeo Drive at Shoal Creek Improvements				
Item Description	Unit	Quantity	Unit Cost	Total Cost
Unclassified Excavation	C.Y.	300622	$ 30.00	$ 9,018,660.00
Site Preparation (10%)	L.S.	1	$ 1,338,453.00	$ 1,338,453.00
Erosion Control (3%)	L.S.	1	$ 402,223.00	$ 402,223.00
Contingency (20%)	L.S.	1	$ 2,682,458.00	$ 2,682,458.00
Total Estimated Construction Cost				$ 13,441,794.00
Additional Associated Costs				
Utility Relocation (2%)	L.S.	1	$ 268,836.00	$ 268,836.00
Engineering and Survey Fee (18%)	L.S.	1	$ 2,419,523.00	$ 2,419,523.00
RW Acquisition and Easements (10%)	L.S.	1	$ 1,344,179.00	$ 1,344,179.00
Total Estimated Project Cost				$ 17,474,300.00

Appendix H

Phase 2

Shobe Road at Unnamed Tributary to Crooked Creek Improvements

Comprehensive Drainage Master Plan

City of Bryant

Phase 2

Shobe Road at Unnamed Tributary to Crooked Creek Improvements

Prepared by:

GARVER

4701 Northshore Drive

North Little Rock, Arkansas 72118

January 2025

Garver Project No.: 20T20090

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Appendices

Appendix H-1: Conceptual Layout and Planning Level Opinion of Project Costs

List of Figures

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1.0 Overall Project Description

A Comprehensive Drainage Master Plan (CDMP) is being developed for the City of Bryant. The purpose of the City of Bryant CDMP is to:

- Evaluate the existing drainage conditions of the City and Extra-Territorial Jurisdiction (ETJ), also known as the planning area;
- Identify current and future drainage problems;
- Generate proposed solutions to identified problems;
- Develop a Capital Improvement Plan (CIP); and
- Provide tools for managing future development.

The CDMP project is being performed in two (2) phases. Phases 1 and 2 will be divided into major tasks, with subtasks listed as applicable below these major tasks. **Figure 1** shows a flow chart of the overall project process.

- Phase 1: Data Collection and Initial Drainage Study Screening
- Phase 2: Survey Collection, Hydrologic and Hydraulic Modeling, Identification of Drainage Problems, Alternative Development, and CIP Development

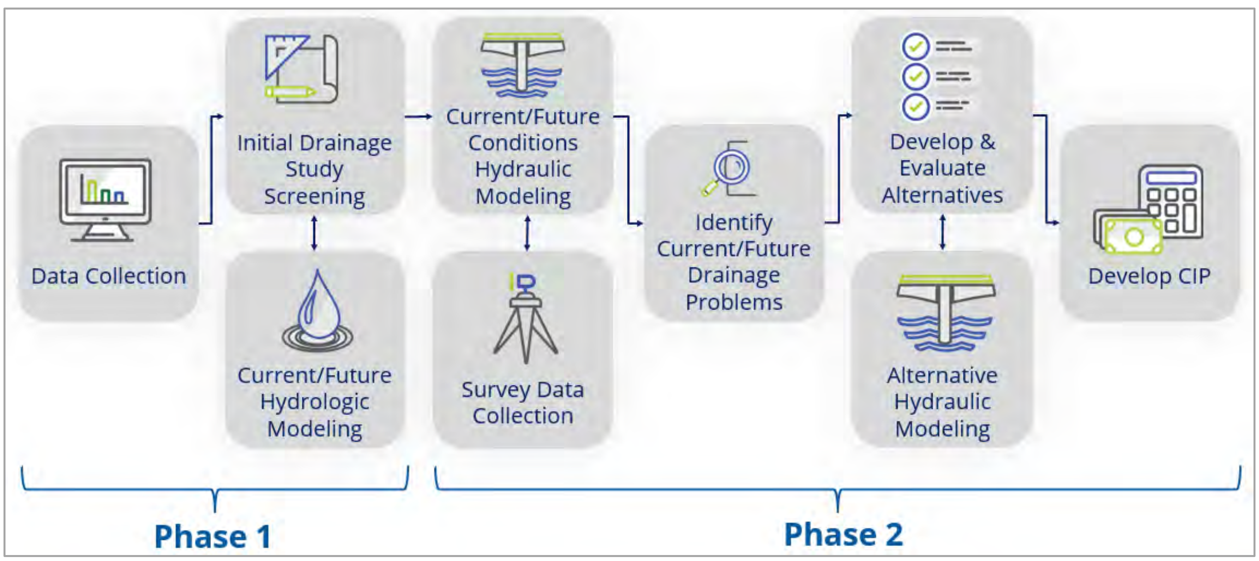


Figure 1. CDMP Project Process

This report discusses the processes and findings of a Phase 2 study for Shobe Road at Unnamed Tributary to Crooked Creek.

2.0 General Information

Shobe Road is a minor arterial class roadway connecting Mills Park Rd to Interstate 30. Shobe Road crosses over Unnamed Tributary to Crooked Creek southeast of the Meadowlake Subdivision. Unnamed Tributary to Crooked Creek is a part of the Crooked Creek drainage basin; the Shobe Road crossing is approximately 500 feet upstream of the confluence with Crooked Creek. The project location map is shown in **Figure 2**.

3.0 National Flood Insurance Program (NFIP) Data

The City of Bryant participates in the FEMA National Flood Insurance Program (NFIP). Current floodplain information and mapping is available in Flood Insurance Study (FIS) Report numbers 05125CV0001B and V0002B for Saline County, Arkansas, and Incorporated Areas. The City is mapped within Flood Insurance Rate Map (FIRM) Panels 0225E, 0240E, 0360E, 0370E, and 0380E. The project area for S. Shobe Road is within Panel 0380E.

Currently, Unnamed Tributary to Crooked Creek is not a mapped stream, so it is generally within Zone X. A portion of the downstream end near the confluence with Crooked Creek is mapped as Zone AE due to backwater from Crooked Creek. The Effective floodplain mapping for the project area is shown in **Figure 3**.

FIGURE 2.
PROJECT LOCATION MAP

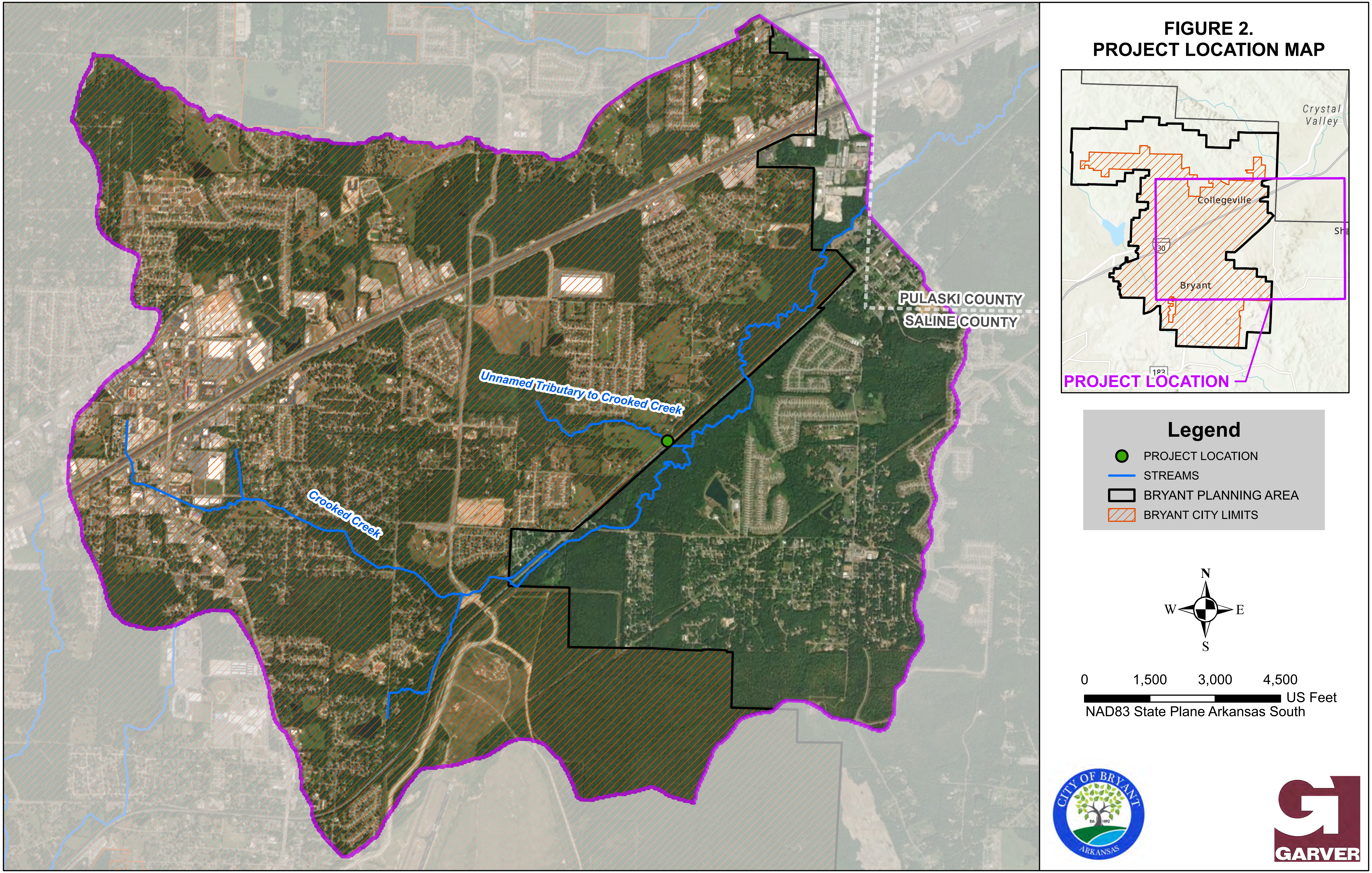
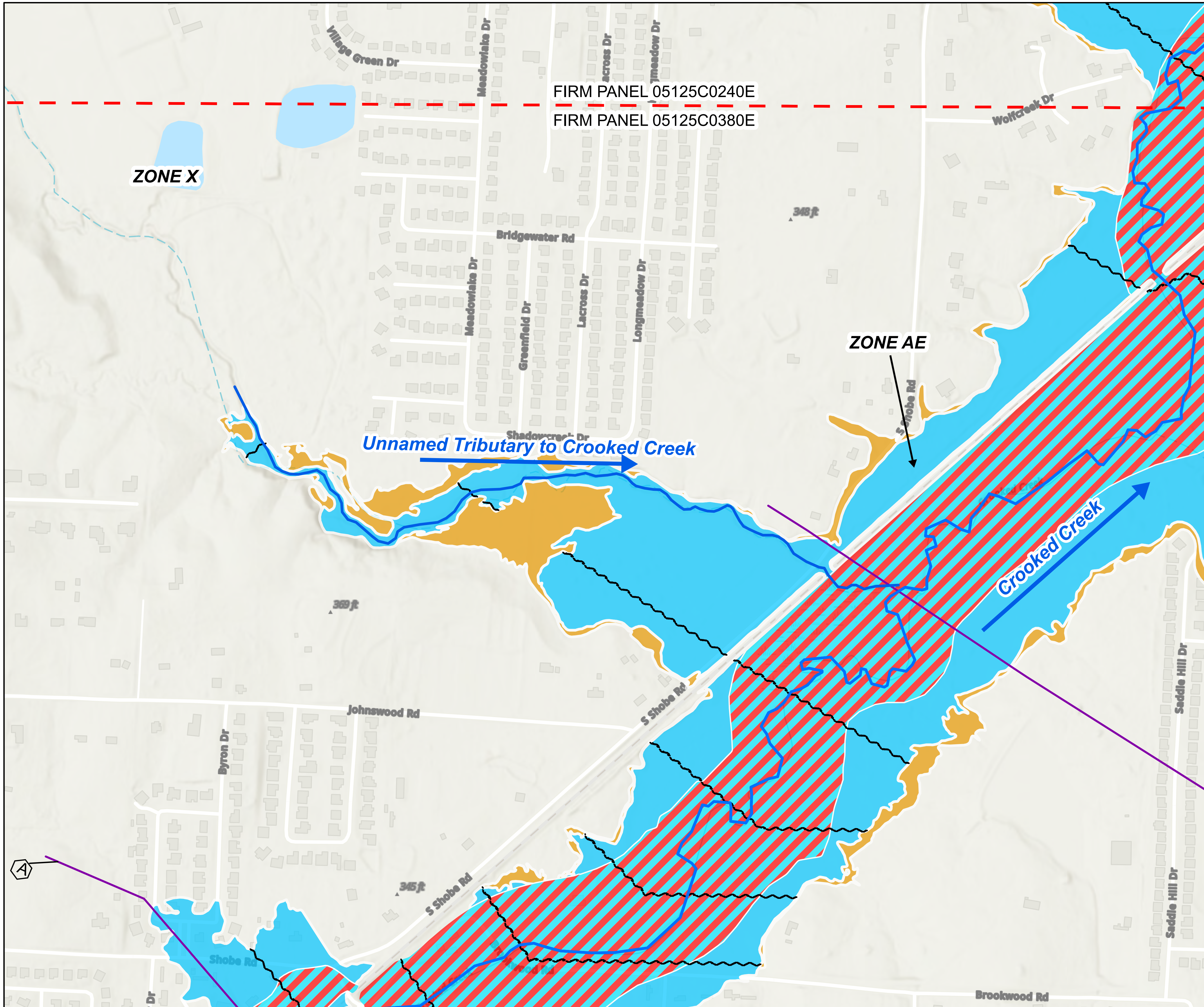
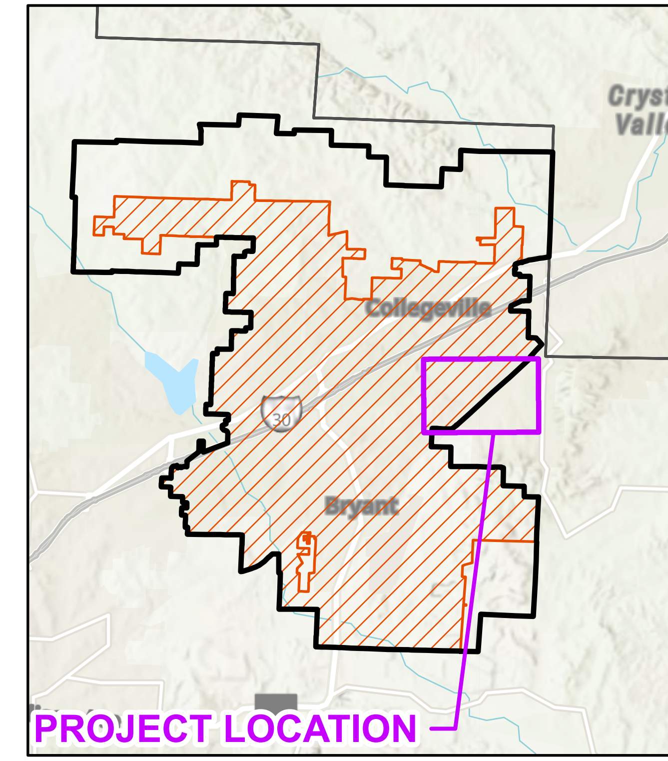


FIGURE 3. FIRM PANEL MAP





Legend

- STREAMS
- FEMA LETTERED SECTIONS
- BASE FLOOD ELEVATIONS
- EFFECTIVE FIRM PANEL BOUNDARIES*
- EFFECTIVE 1% ANNUAL CHANCE FLOOD HAZARD*
- EFFECTIVE FLOODWAY*
- EFFECTIVE 0.2% ANNUAL CHANCE FLOOD HAZARD*

*Digital National Flood Hazard Layer (NFHL) data acquired from the FEMA Map Service Center for Saline County, Arkansas. 05125C0240E and 05125C0380E dated effective 06/05/2020.

N W E S

0 400 800 1,200 US Feet

NAD83 State Plane Arkansas South

CITY OF BRYANT ARKANSAS

GARVER

4.0 Data Collection

4.1 GIS and Topographic Data

For this project, 1-meter Digital Elevation Model (DEM) lidar topography from USGS Ouachita study was acquired from the Arkansas GIS Office. Garnat collected survey for the project, including hydraulic cross sections and structure data. A photo of Shobe Road at the creek crossing is shown in Figure 4.

Figure 4. Shobe Road at Unnamed Tributary to Crooked Creek

4.2 Resident Comment Database

For this CDMP, a public comment period was issued to allow city residents to submit drainage issues. The comment period ran from April 10 to May 22, 2022. A total of 264 comments were received for the city planning area. 128 comments were within the Crooked Creek drainage Basin**.** Zero resident comments were received for the Unnamed Tributary to Crooked near the project location for S. Shobe Road.

5.0 Initial Screening Study

During Phase 1, an Initial Screening Study was performed for the Crooked Creek Basin. For this screening, a hydraulic model was developed for the entire basin using 2D HEC-RAS and utilized rain-on-grid methodology to apply precipitation directly to the ground surface. This model was used to identify flood issues throughout the City, so is considered a qualitative model and not to be used for design. However, the data is useful in determining relative flood risk, and a flood severity index (FSI) was developed using the model results. Flood severity ranges from 0 to 4, with 4 being the most severe. The FSI classifications are listed in **Table 1**. **Table 2** displays the FSI rankings for S. Shobe Road.

Table 1. Flood Severity Index Classes

Class	Description	Maximum Flood Depth (ft)	Maximum Flood Velocity (ft/s)
FS0	Minimal severity	< 0.5	-
FS1	Unsafe for vehicles and pedestrians	< 1.5	< 6.0
FS2	Moderate flooding hazard for buildings	< 3	< 6.0
FS3	Potential for structural damage	> 3	< 6.0
FS4	Unsafe for vehicles and pedestrians; Potential for structural damage	> 0.5	>6.0

Table 2. Flood Severity Index for S. Shobe Road

Location	Stream Name	Basin	Potential Drainage Issue	Flood Severity Index			
				5 yr	10 yr	50 yr	100 yr
S. Shobe Road	Unnamed Tributary to Crooked Creek	Crooked Creek	Roadway overtopping	1	1	2	3

Because of the high likelihood of flooding at multiple storm events, S. Shobe Road was selected for further hydraulic study in order to identify conceptual drainage improvements.

6.0 Hydrology

In Phase 1 of the CDMP, a hydrologic model of the Crooked Creek basin was created using HEC-HMS 4.10. This model included Unnamed Tributary to Crooked Creek as a subbasin of Crooked Creek. HEC-HMS flow rates were used in the design hydraulic model. The determined flow rates are provided in **Table 3**.

Table 3. Summary of Discharges for Unnamed Tributary to Crooked Creek

Location along Stream	Drainage Area (sq mi)	Flow Rate (cfs)						
		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
Just upstream of confluence with Crooked Creek	2.68	1,555	2,057	2,461	3,023	3,442	3,898	4,976

7.0 Hydraulics

The hydraulic analysis was performed using HEC-RAS version 6.3.1. Because the project area is mapped as Zone X, no effective FEMA model exists. Therefore, a new hydraulic model was created for the project.

The 2-, 5-, 10-, 25-, 50-, 100-, and 500-year flows obtained from the HEC-HMS model discussed above were used in the models. The downstream boundary condition was set to a normal depth slope of 0.003 ft/ft. The slope was determined based on the average slope of the thalweg in the downstream portion of the modeled reach.

7.1 Existing Conditions

RAS Mapper was utilized to create the stream centerline, bank stations, flowpaths, cross sections, and profile lines for the model. Cross sections were located and oriented as required for proper hydraulic modeling of the floodplain. Cross section geometry data was updated with survey data where appropriate. Figure 6 shows a map of the model layout. The upstream model limits were set from approximately 2,800 feet downstream of Bryant Parkway to the confluence with Crooked Creek.

Cross section geometry was taken from 1-meter (DEM) lidar topography discussed in **section 4.1**.

Manning's *n* values in the model were determined based on aerial imagery and site visit information. Ineffective areas for the flow were set based on topography and ineffective areas due to structures were set based on roadway elevations per the ARDOT Drainage Manual.

Existing structure data for the stream crossing was determined from project. Parameters for the existing structures is given in **Table 4**. In addition to the Shobe Road crossing, a railroad crossing of the unnamed tributary just downstream of Shobe Road was modeled.

Table 4. Existing Shobe Road Structure Data

Parameter	Value
Bridge Configuration	Single-span @ 26 feet
Pier Type and Size	N/A
Abutment Type	Vertical
Minimum Top of Road within Floodplain	325.81 ft NAVD88
Open Flow Area	118.66 sq. ft

In existing conditions, the structure overtops during all modeled flood events (2-year through 500-year). This overtopping is largely due to backwater from the railroad crossing just downstream.

7.2 Proposed Conditions

Based on the existing conditions results, Shobe Road was identified as deficient for conveying storm flows at even lower rainfall amounts. Initial iterations found that the Shobe Road crossing could not be reasonably redesign to convey the 25-year event. This is due to the significant backwater occurring from the railroad crossing just downstream. In order to pass a 25-year event without overtopping, flows along the creek would need to be decreased. Drainage improvements were iterated to upsize the bridge while decreasing flow using a detention pond.

After multiple iterations, a design was developed to convey the 25-year event storm without overtopping the roadway. In order to convey the 25-year event, the detention pond would need to retain a volume of approximately 3.4 acre-feet. Parameters for the proposed bridge updates are provided in **Table 5**.

Table 5. Proposed Shobe Roade Structure Data

Parameter	Value
Bridge Configuration	700 feet long (spans TBD)
Pier Type and Size	To be determined
Abutment Type	To be determined
Minimum Top of Road within Floodplain	329 ft NAVD88
Open Flow Area	2872 sq. ft

A comparison of existing and proposed water surface elevations during the 25-year event is given in **Conceptual Layout** and Planning Level Opinion of Project Costs

A conceptual layout drawing and planning level opinion of project costs are provided in Appendix H-1. This layout is for graphical and planning purposes only and is not for construction.

Table 6. The existing and proposed floodplain boundaries are shown in **Figure 5**.

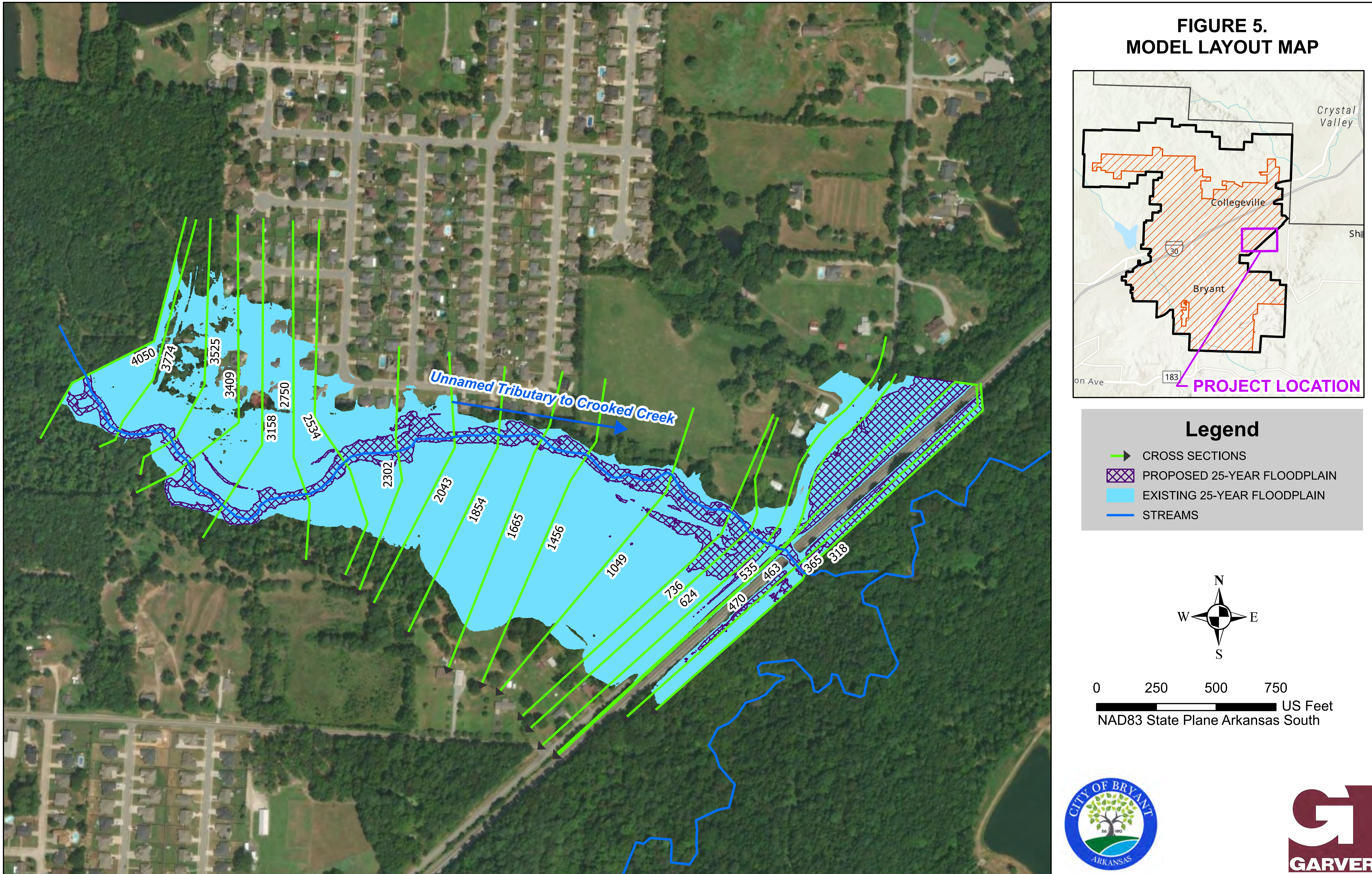
8.0 Conceptual Layout and Planning Level Opinion of Project Costs

A conceptual layout drawing and planning level opinion of project costs are provided in Appendix H-1. This layout is for graphical and planning purposes only and is not for construction.

Table 6. Comparison of Existing and Proposed WSELs for 25-year event

Model Cross Section	Existing Conditions WSEL (ft NAVD88)	Proposed Conditions WSEL (ft NAVD88)	Difference in WSEL (ft)
4050	337.81	337.81	0.00
3774	336.24	336.24	0.00
3525	335.89	335.89	0.00
3409	334.84	334.84	0.00
3158	334.54	334.54	0.00
2750	333.71	333.68	0.03
2534	333.33	333.28	0.05
2302	333.14	333.08	0.06
2043	332.54	332.41	0.13
1854	332.04	331.74	0.30
1665	332.15	331.89	0.26
1456	331.82	331.47	0.35
1049	331.62	331.22	0.40
736	331.05	330.53	0.52
624	331.27	330.79	0.48
535	330.56	330.29	0.27
495		Shobe Road	
470	329.84	330.01	-0.17
463	330.07	330.07	0.00
423		Railroad Bridge	
365	327.64	327.64	0.00
318	326.73	326.73	0.00

FIGURE 5.
MODEL LAYOUT MAP



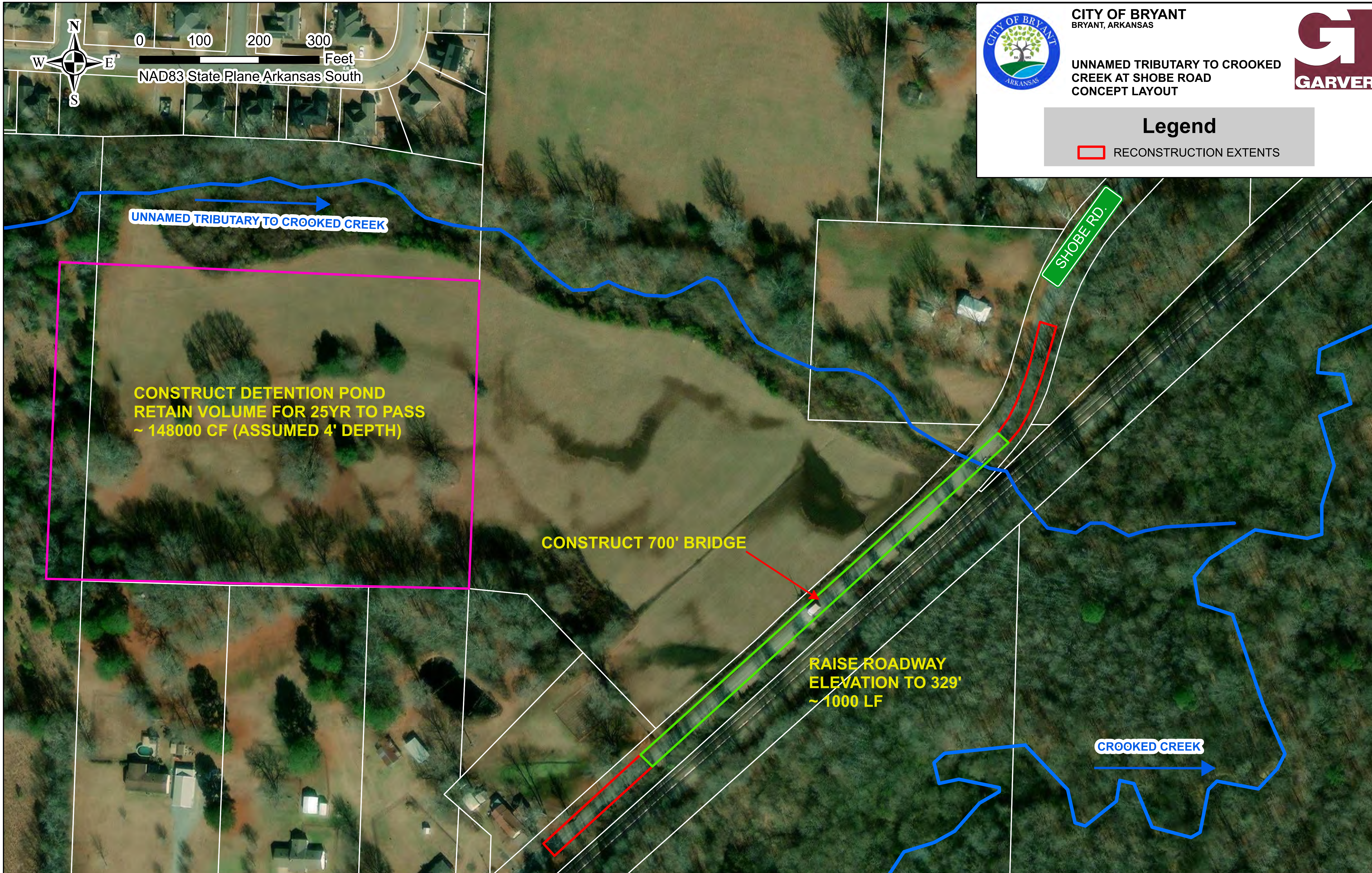
Appendix H-1

Phase 2

Shobe Road at Unnamed Tributary to Crooked Creek Improvements

Conceptual Layout and

Planning Level Opinion of Project Costs



N
S
E
W
0
100
200
300
Feet
NAD83 State Plane Arkansas South
CITY OF BRYANT
BRYANT, ARKANSAS
UNNAMED TRIBUTARY TO CROOKED CREEK AT SHOBE ROAD CONCEPT LAYOUT
GARVER
Legend
RECONSTRUCTION EXTENTS
UNNAMED TRIBUTARY TO CROOKED CREEK
SHOBE RD.
CONSTRUCT DETENTION POND
RETAIN VOLUME FOR 25YR TO PASS
~ 148000 CF (ASSUMED 4' DEPTH)
CONSTRUCT 700' BRIDGE
RAISE ROADWAY
ELEVATION TO 329'
~ 1000 LF
CROOKED CREEK

Planning Level Opinion of Project Costs Shobe Road at Unnamed Tributary to Crooked Creek Improvements				
Item Description	Unit	Quantity	Unit Cost	Total Cost
Unclassified Excavation	C.Y.	5482	$ 30.00	$ 164,460.00
Roadway Construction	Mile	0.07	$ 5,000,000.00	$ 350,000.00
Unnamed Tributary Bridge (28' x 700')	S.F.	19600	$ 340.00	$ 6,664,000.00
Site Preparation (10%)	L.S.	1	$ 1,061,244.00	$ 1,061,244.00
Traffic Control (1%)	L.S.	1	$ 106,879.00	$ 106,879.00
Erosion Control (3%)	L.S.	1	$ 320,807.00	$ 320,807.00
Contingency (20%)	L.S.	1	$ 2,141,990.00	$ 2,141,990.00
Total Estimated Construction Cost				$ 10,809,380.00
Additional Associated Costs				
Utility Relocation (10%)	L.S.	1	$ 1,080,938.00	$ 1,080,938.00
Engineering and Survey Fee (18%)	L.S.	1	$ 1,945,688.00	$ 1,945,688.00
RW Acquisition and Easements (2%)	L.S.	1	$ 216,188.00	$ 216,188.00
Total Estimated Project Cost				$ 14,052,200.00

Appendix I

Phase 2

Oak Glenn Subdivision Improvements

Comprehensive Drainage Master Plan

City of Bryant

Phase 2

Oak Glenn Subdivision Improvements

Prepared by:

GARVER

4701 Northshore Drive
North Little Rock, Arkansas 72118

Submitted March 2023
Garver Project No.: 20T20090

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Appendices

Appendix I-1: Conceptual Layout and Planning Level Opinion of Project Costs

List of Figures

List of Tables

1.0 Overall Project Description

A Comprehensive Drainage Master Plan (CDMP) is being developed for the City of Bryant. The purpose of the City of Bryant CDMP is to:

- Evaluate the existing drainage conditions of the City and Extra-Territorial Jurisdiction (ETJ), also known as the planning area;
- Identify current and future drainage problems;
- Generate proposed solutions to identified problems;
- Develop a Capital Improvement Plan (CIP); and
- Provide tools for managing future development.

The CDMP project is being performed in two (2) phases. Phases 1 and 2 will be divided into major tasks, with subtasks listed as applicable below these major tasks. **Figure 1** shows a flow chart of the overall project process.

- Phase 1: Data Collection and Initial Drainage Study Screening
- Phase 2: Survey Collection, Hydrologic and Hydraulic Modeling, Identification of Drainage Problems, Alternative Development, and CIP Development

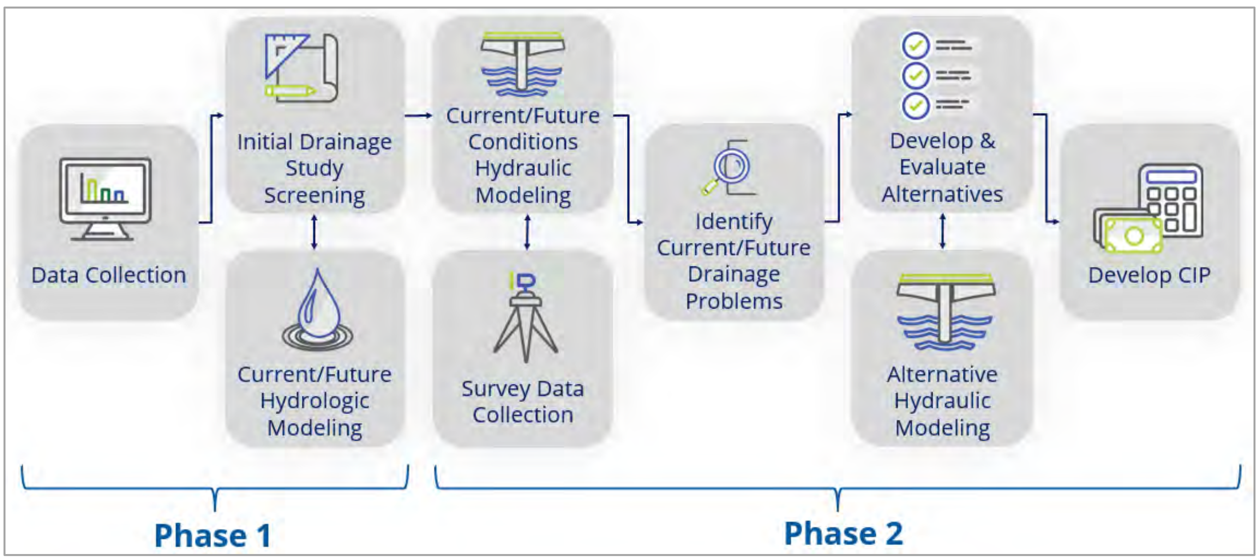


Figure 1. CDMP Project Process

This report discusses the processes and findings of a Phase 2 study within the Oak Glenn Subdivision.

2.0 General Subdivision Information

The Oak Glenn Subdivision is located within the Owen Creek drainage basin. The north and west boundary lines of the subdivision align with the north-central city limit boundary. Phase 1 of the subdivision was constructed from 2009 and 2012, Phase 2 from 2012 and 2015, and Phases 3 and 4 from 2015 to 2017. A project location map is shown in Figure 2.

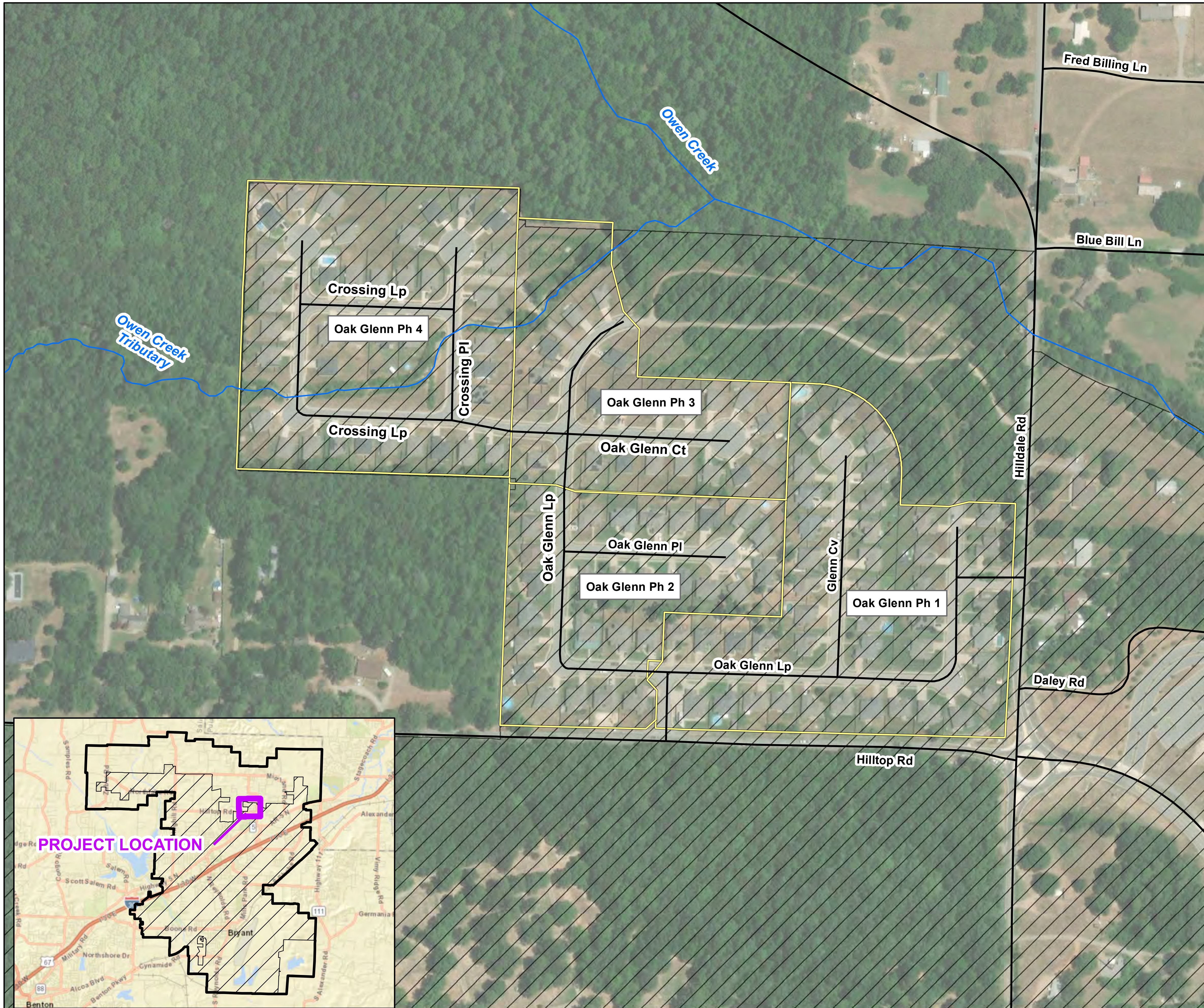
The Oak Glenn subdivision drainage system includes a network of curb inlets and storm sewer pipes as well as open channel drainage. Owen Creek Tributary flows through Phase 4 and the western portion of Phase 3 of the subdivision, and these areas of drain to the tributary. The remainder of the subdivision, Phases 1, 2, and the eastern portion of 3, drain to Owen Creek. A map of the existing drainage system of the Oak Glenn Subdivision is shown in Figure 3.

3.0 National Flood Insurance Program (NFIP) Data

The City of Bryant participates in the FEMA National Flood Insurance Program (NFIP). Current floodplain information and mapping is available in Flood Insurance Study (FIS) Report numbers 05125CV0001B and V0002B for Saline County, Arkansas, and Incorporated Areas. The City is mapped within Flood Insurance Rate Map (FIRM) Panels 0225E, 0240E, 0370E, and 0380E. The Oak Glenn Subdivision is entirely within Panel 0240E.

Owen Creek is mapped as Zone AE with floodway. Currently, Owen Creek Tributary is not a mapped stream, so is generally within Zone X. However, a portion of the tributary near the confluence with Owen Creek is within the Owen Creek floodplain. Approximately 800 feet of the downstream reach is mapped within the Zone AE floodplain. The Effective floodplain mapping for the project area is shown in Figure 4.

FIGURE 2. PROJECT LOCATION MAP



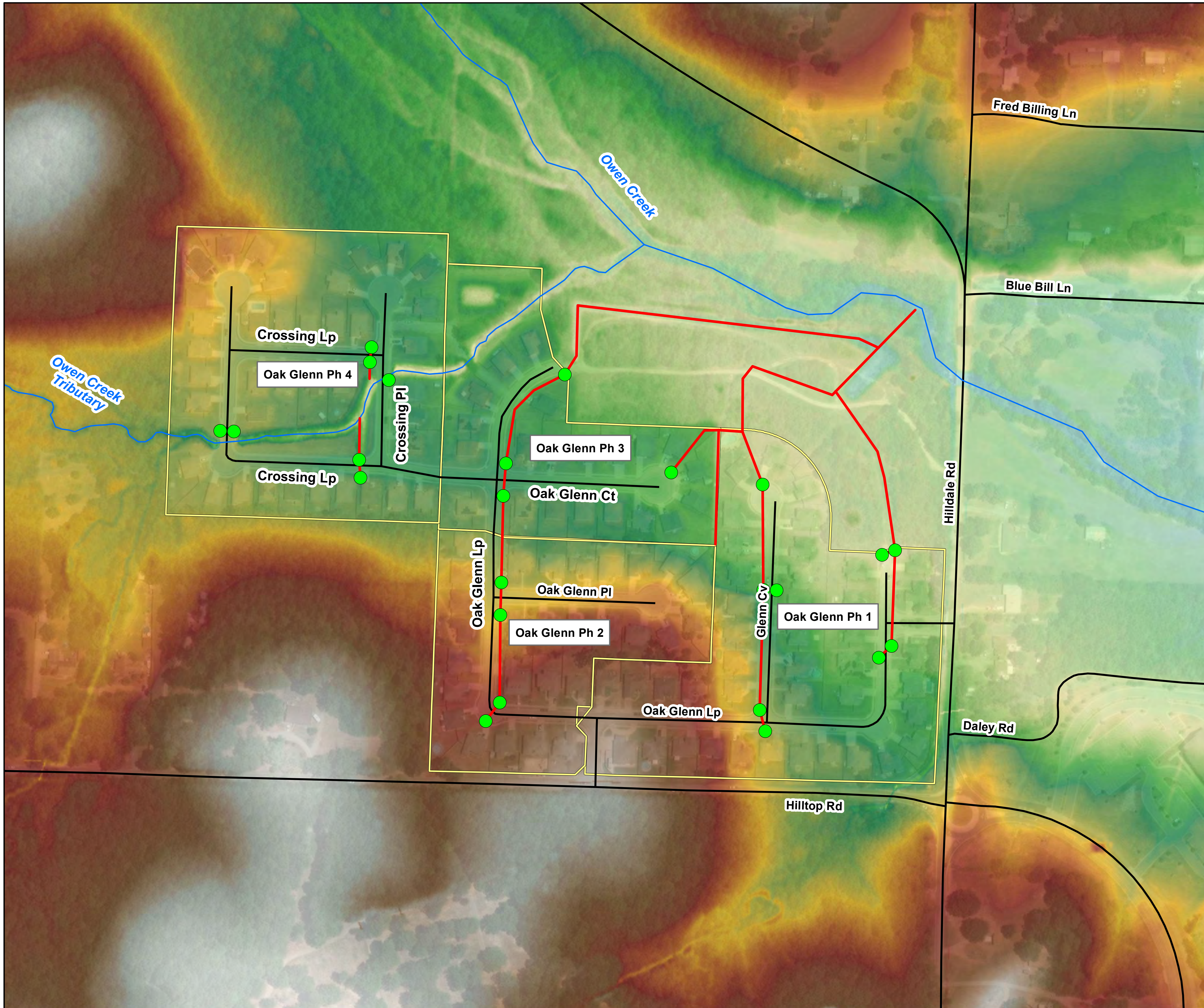
Streams
Roads
Subdivision Boundary
Bryant City Limits
Bryant Planning Area

N

0 250 500 Feet

GARVER

FIGURE 3.
EXISTING DRAINAGE MAP



Existing Storm Inlet
Existing Storm Pipe
Streams
Roads
Subdivision Boundary

2016 lidar (ft NAVD88)

Value

High : 126

Low : 106

N

0 250 500 Feet

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CITY OF BRYANT ARKANSAS

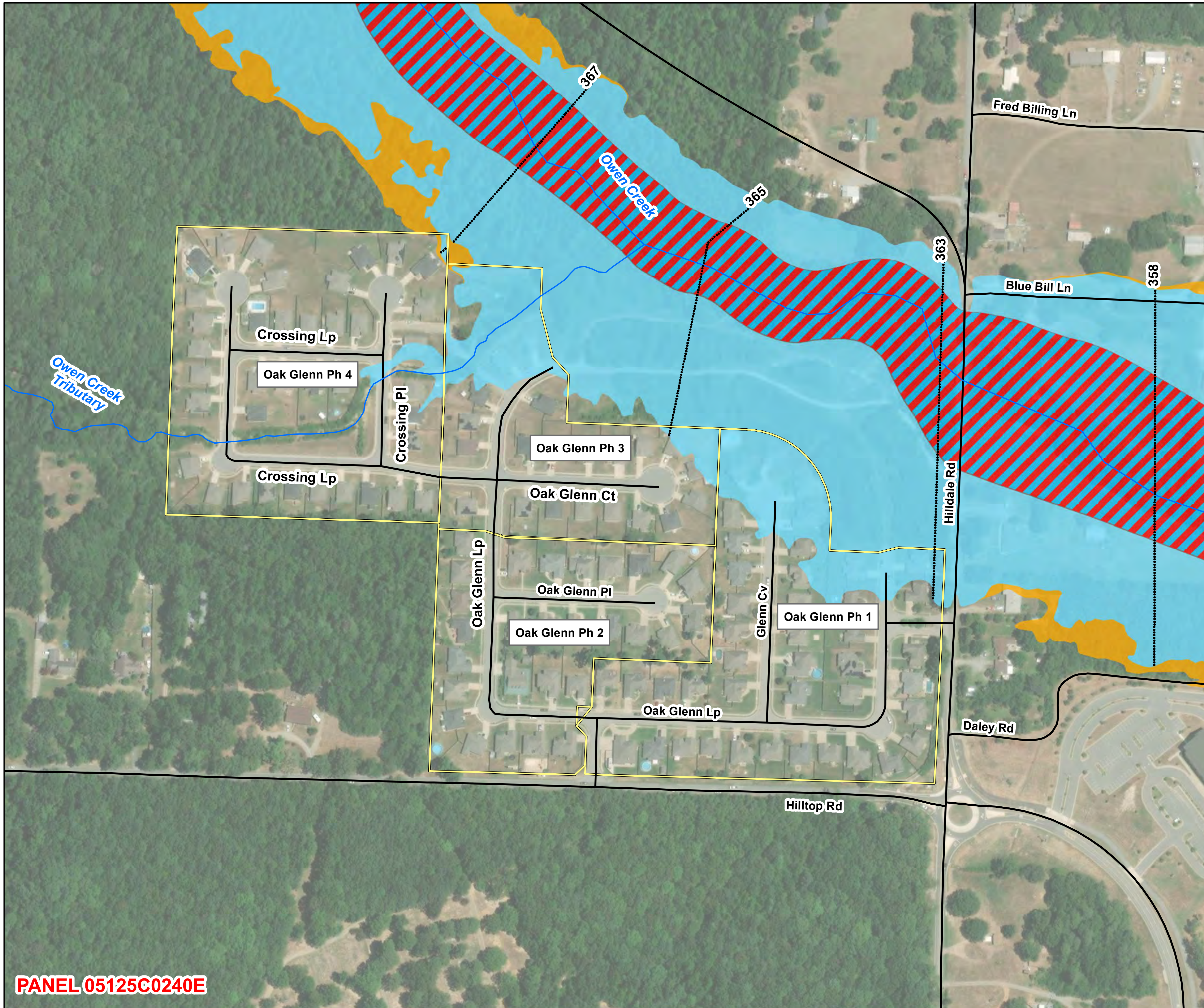


FIGURE 4. EFFECTIVE FLOODPLAIN MAP

- Effective Base Flood Elevation
- Streams
- Roads
- Subdivision Boundary
- Floodway
- 1% Annual Chance Event
- 0.2% Annual Chance Event
- FEMA FIRM Panel

Effective FEMA FIRM Panel boundaries and Floodplain boundaries were acquired from NFHL DIFRM Data for Saline County, dated June 5, 2020.

N

0 250 500 Feet

GARVER

CITY OF BRYANT ARKANSAS

4.0 Data Collection

4.1 Historical Records of Drainage and Flooding

4.1.1 City and Public News Records

The City has documented many past flood events within the Oak Glenn Subdivision, and at least one flood event in the neighborhood was the subject of a news story in 2021. At least four known flood events have occurred in Oak Glenn Phase 4 since 2016. Many of the flood reports focus on the southwest corner of Phase 4. In multiple events, flood waters have overtopped the Crossing Loop culvert crossing and flooded the cul-de-sac and low-lying yards. Water has also overtopped the Crossing Place culvert in multiple instances. When both culvert crossings are overtopped, homes to the north of the tributary are not accessible. This presents a significant safety issue for emergency access and egress of the neighborhood.

4.1.2 Resident Comment Database

For this CDMP, a public comment period was issued to allow city residents to submit drainage issues. The comment period ran from April 10 to May 22, 2022. A total of 264 comments were received for the city planning area. Six comments were within the Oak Glenn project area.

The known flood areas and resident comment locations are provided on Figure 5. A photograph of the May 2019 flood at Crossing Loop is in Figure 6, and the February 2023 flood event at Crossing Place in Figure 7.

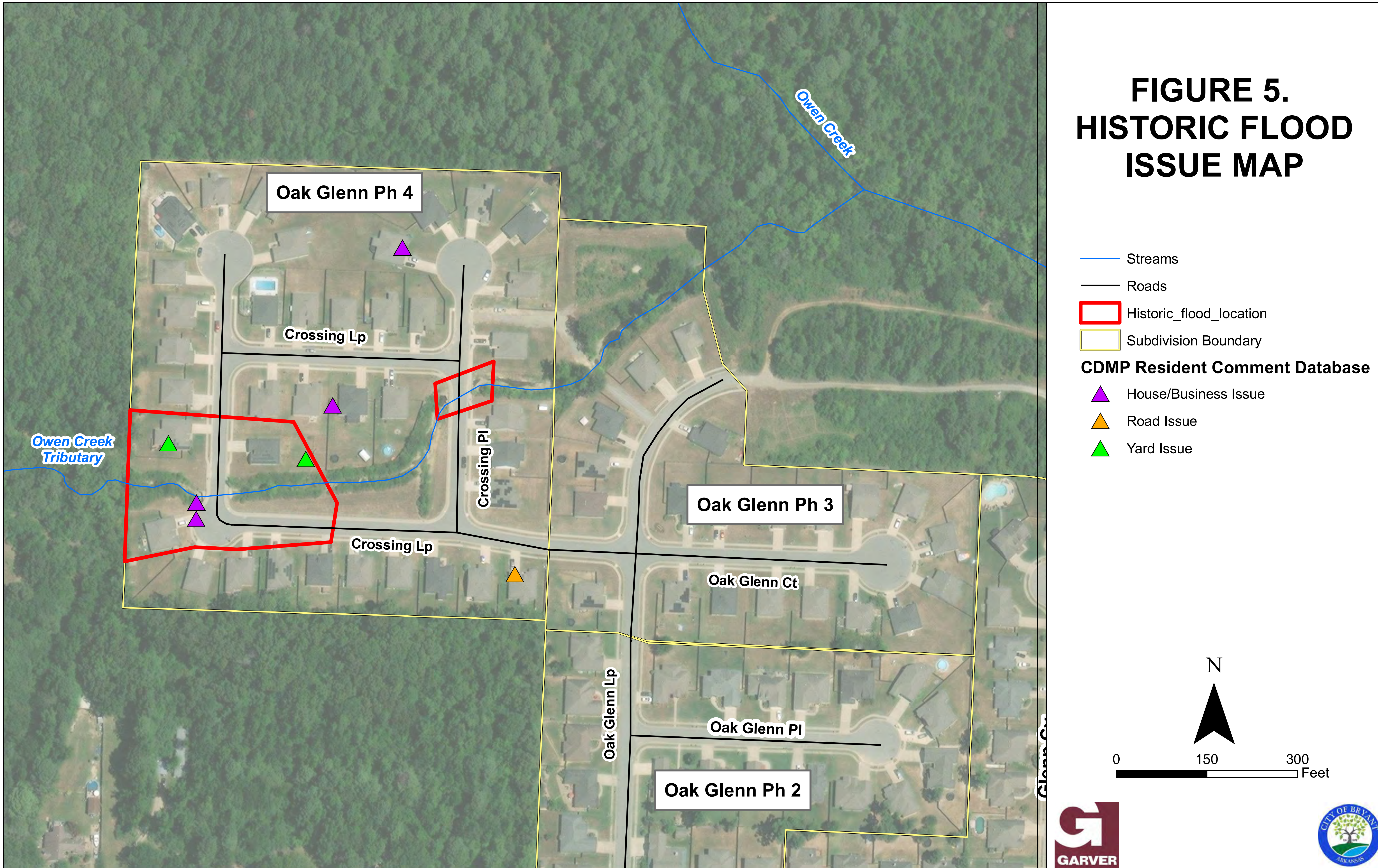


FIGURE 5. HISTORIC FLOOD ISSUE MAP

Figure 6. Crossing Loop during May 2019 Flood Event

Figure 7. Crossing Place during February 2023 Flood Event

4.2 As-built Plans and Data for Existing Infrastructure

The City provided as-built plans for Phases 2, 3, and 4 of Oak Glenn Subdivision. This data was utilized to identify the existing stormwater network location and sizing.

4.3 GIS and Topographic Data

GIS data was collected for the CDMP and utilized for the Oak Glenn Subdivision study. Collected data included city and planning area limits, stormwater points and flowlines, subdivision boundaries, NFHL data, land use data, and topographic data.

For this project, 1-meter Digital Elevation Model (DEM) lidar topography from USGS Ouachita study was acquired from the Arkansas GIS Office. Project survey along Owen Creek Tributary was collected by Garnat to supplement the lidar data.

5.0 Initial Screening Study

During Phase 1, an Initial Screening Study was performed for the Owen Creek basin. For this screening, a hydraulic model was developed for the entire basin using 2D HEC-RAS and utilized rain-on-grid methodology to apply precipitation directly to the ground surface. This model was used to identify flood issues throughout the City, so is considered a qualitative model and not to be used for design. However, the data is useful in determining relative flood risk, and a flood severity index (FSI) was developed using the model results. Flood severity ranges from 0 to 4, with 4 being the most severe. The FSI classifications are listed in Table 1. Table 2 displays the FSI rankings for Oak Glenn Subdivision.

Table 1. Flood Severity Index Classes

Class	Description	Maximum Flood Depth (ft)	Maximum Flood Velocity (ft/s)
FS0	Minimal severity	< 0.5	-
FS1	Unsafe for vehicles and pedestrians	< 1.5	< 6.0
FS2	Moderate flooding hazard for buildings	< 3	< 6.0
FS3	Potential for structural damage	> 3	< 6.0
FS4	Unsafe for vehicles and pedestrians; Potential for structural damage	> 0.5	>6.0

Because of the high likelihood of flooding at multiple storm events, and historical flood issues in the area, Oak Glenn Subdivision was selected for further hydraulic study in order to identify conceptual drainage improvements.

Table 2. Flood Severity Index For Oak Glenn Subdivision

Location	Stream Name	Basin	Potential Drainage Issue	Flood Severity Index				Resident Comments
				5 yr	10 yr	50 yr	100 yr	
Oak Glenn Subdivision	Owen Creek Tributary	Owen Creek	Neighborhood flooding; home flooding	1	2	2	3	6

6.0 Hydrology

In Phase 1 of the CDMP, a hydrologic model of the Owen Creek basin was created using HEC-HMS 4.10. This model included Owen Creek Tributary. The determined flow rates are provided in Table 3. Delineated subbasins for Owen Creek Tributary are shown in Figure 8.

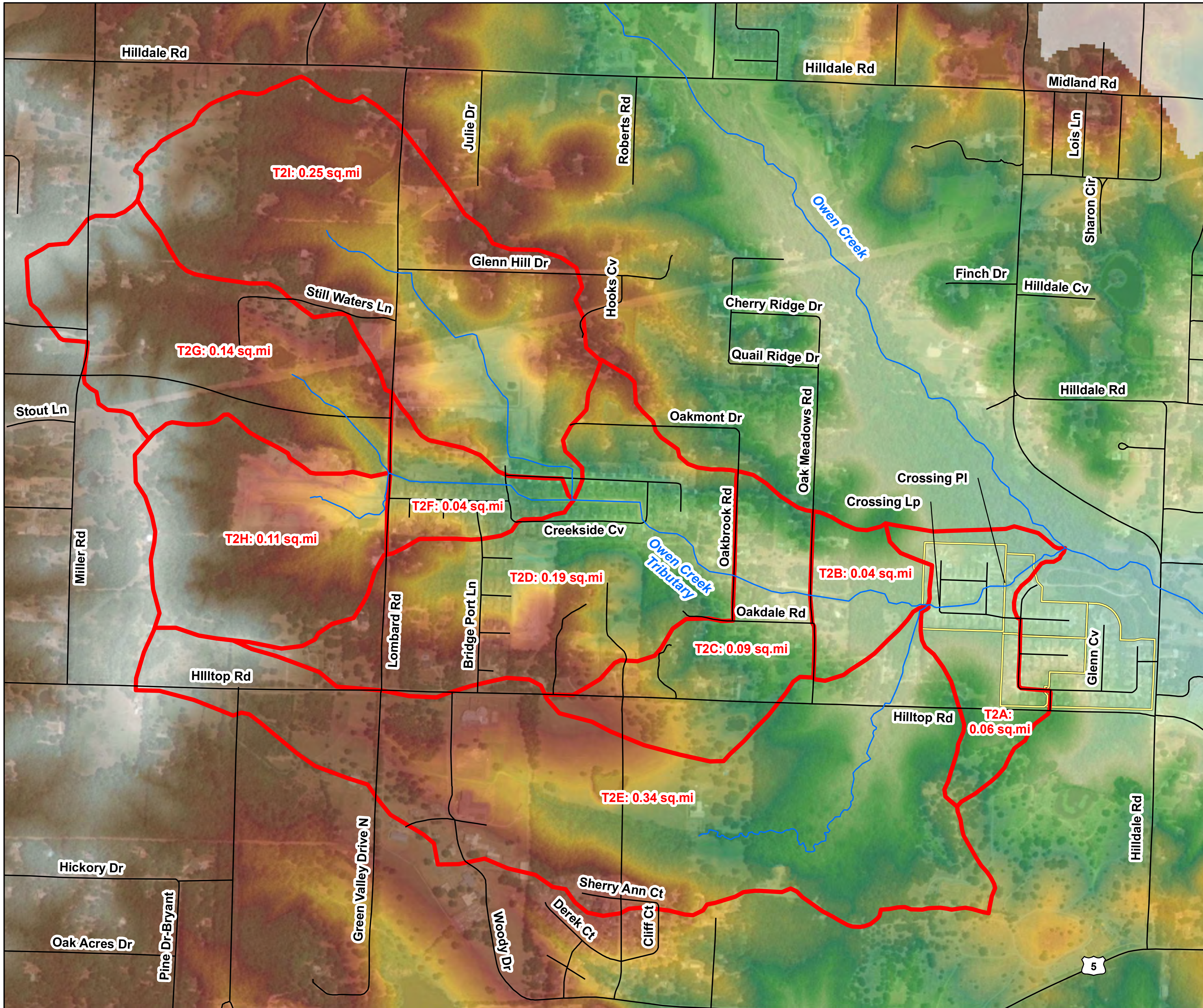
Table 3. Summary of Discharges for Owen Creek Tributary

Location along Stream	Drainage Area (sq mi)	Flow Rate (cfs)						
		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
At Oak Meadows Road	0.81	644	857	1,042	1,297	1,504	1,715	2,175
At Crossing Loop	1.19	903	1,195	1,461	1,818	2,097	2,397	3,043
Just upstream of confluence with Owen Creek	1.25	919	1,212	1,476	1,786	2,042	2,308	2,988

Flows determined in the HEC-HMS were compared to those calculated by the initial screening study model. For the 5-year and 10-year events, flows in the HEC-HMS model were slightly higher than in the screening model by up to 17%. For the 50-year and 100-year events, flows in the HEC-HMS model were slightly lower than the screening model by up to 18%. These differences are due to differences in calculation methodology and well as the fact that the screening model is based on lidar only and not fully representative of the drainage system. Differences in values are considered acceptable. HEC-HMS flow rates were used in the design hydraulic model.

.

FIGURE 8. HYDROLOGY MAP



7.0 Hydraulics

The hydraulic analysis was performed using HEC-RAS version 6.3.1. Because the project area is mapped as Zone X, no effective FEMA model exists. Therefore, a new hydraulic model was created for the project.

The 2-, 5-, 10-, 25-, 50-, 100-, and 500-year flows obtained from the HEC-HMS model discussed above were used in the models. The downstream boundary condition was set to a normal depth slope of 0.01 ft/ft. The slope was determined based on the average slope of the thalweg in the downstream portion of the modeled reach.

7.1 Existing Conditions

RAS Mapper was utilized to create the stream centerline, bank stations, flowpaths, cross sections, and profile lines for the model. Cross sections were located and oriented as required for proper hydraulic modeling of the floodplain. Cross section geometry data was updated with survey data where appropriate. Figure 9 shows a map of the model layout. The upstream model limits were set from approximately 1,100 feet upstream of Crossing Loop to the confluence with Owen Creek.

Cross section geometry was taken from 2016 USGS lidar data for the area and supplemented with project survey points collected by Garnat.

Manning's *n* values in the model were determined based on aerial imagery and site visit information. Ineffective areas for the flow were set based on topography and ineffective areas due to structures were set based on roadway elevations per the ArDOT Drainage Manual.

Existing structure data for the three stream crossings in the project model was determined from project survey as well as as-built drawings for the subdivision. Parameters for the existing structures are given in Tables 4, 5, and 6.

Table 4. Existing Crossing Loop Structure Data

Parameter	Value
Culvert Size & Type	2-8'x6' RCB
Upstream Invert Elevation	366.375
Downstream Invert Elevation	366.533
Box Length	48 ft
Open Flow Area	96 sq. ft

Table 5. Existing Crossing Place Structure Data

Parameter	Value
Culvert Size & Type	2-8'x6' RCB
Upstream Invert Elevation	361.292
Downstream Invert Elevation	360.783
Box Length	50 ft
Open Flow Area	96 sq. ft

Table 6. Existing Access Easement Structure Data

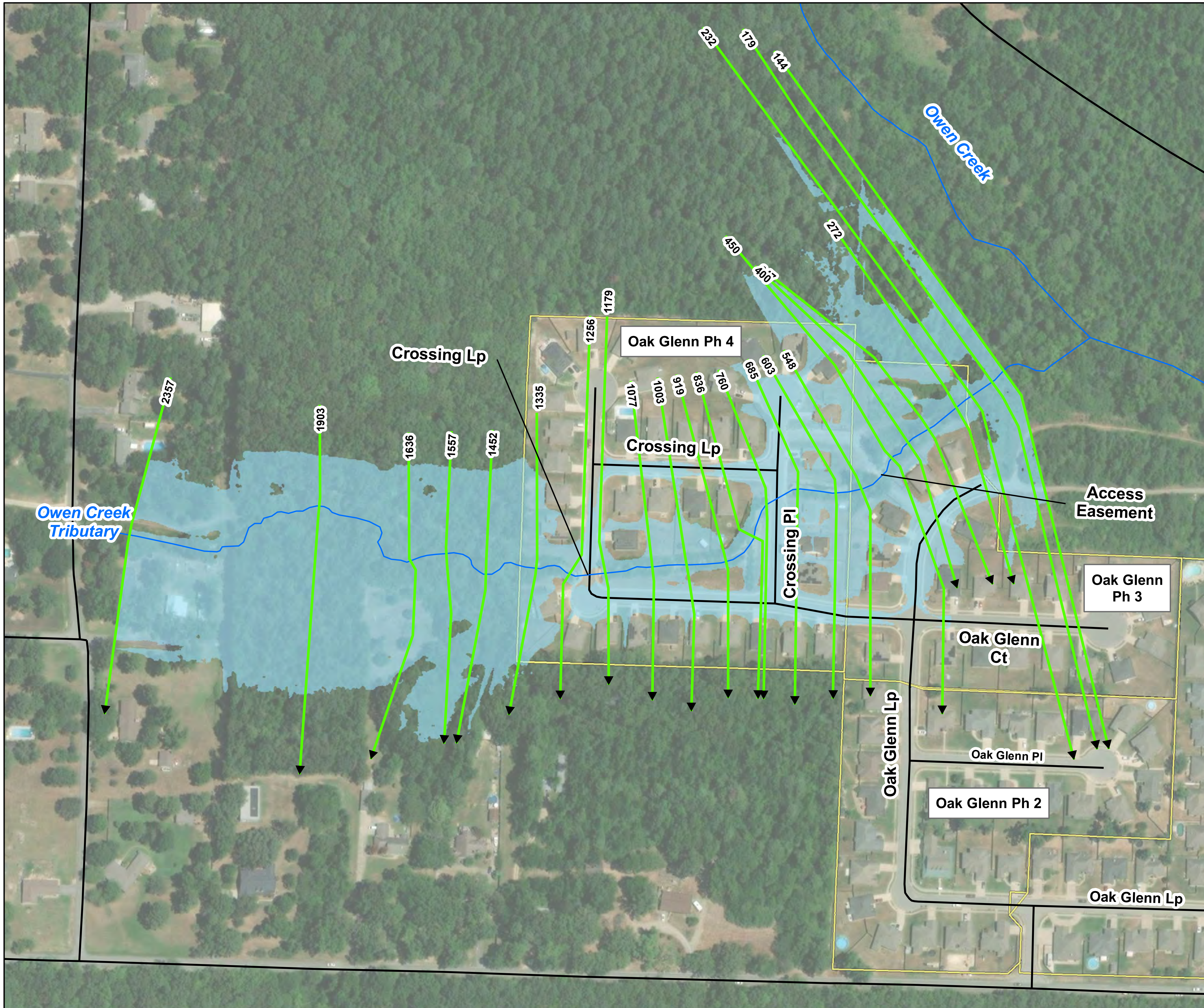
Parameter	Value
Culvert Size & Type	2-8'x6' RCB
Upstream Invert Elevation	361.163
Downstream Invert Elevation	361.163
Box Length	25 ft
Open Flow Area	96 sq. ft

In existing conditions, all structures overtop during all modeled flood events (2-year through 500-year). This aligns with the frequency of known flood events in the subdivision. The existing 25-year flood boundaries are displayed in Figure 9.

7.2 Proposed Conditions

Based on the existing conditions results, all three culvert crossings of Owen Creek Tributary were identified as deficient for conveying storm flows at even lower rainfall amounts. Therefore, drainage improvements were iterated to upsize these culverts as well as improve the flow capacity of the stream channel. After multiple iterations, a design was developed to convey the 25-year event storm without overtopping roadways. This design involves upsizing the culverts at Crossing Loop and Crossing Place and removing the access easement crossing. In addition to these changes, the stream throughout the subdivision will be redesigned into a rectangular concrete channel to allow for improved conveyance during storm events. Parameters for the proposed updates are provided in Tables 7, 8, and 9.

FIGURE 9. EXISTING CONDITIONS MODEL MAP



Model Cross Sections
Streams
Roads
25-Year Existing Conditions Flood Boundary
Subdivision Boundary

N
0 150 300 Feet

GARVER
CITY OF BRYANT ARKANSAS

Table 7. Proposed Crossing Loop Structure Data

Parameter	Value
Culvert Size & Type	3-10'x6' RCB
Upstream Invert Elevation	366.375
Downstream Invert Elevation	365.74
Box Length	48
Open Flow Area	180 sq. ft

Table 8. Proposed Crossing Place Structure Data

Parameter	Value
Culvert Size & Type	3-10'x6' RCB
Upstream Invert Elevation	361.292
Downstream Invert Elevation	360.783
Box Length	50
Open Flow Area	180 sq. ft

Table 9. Proposed Channel Improvement Data

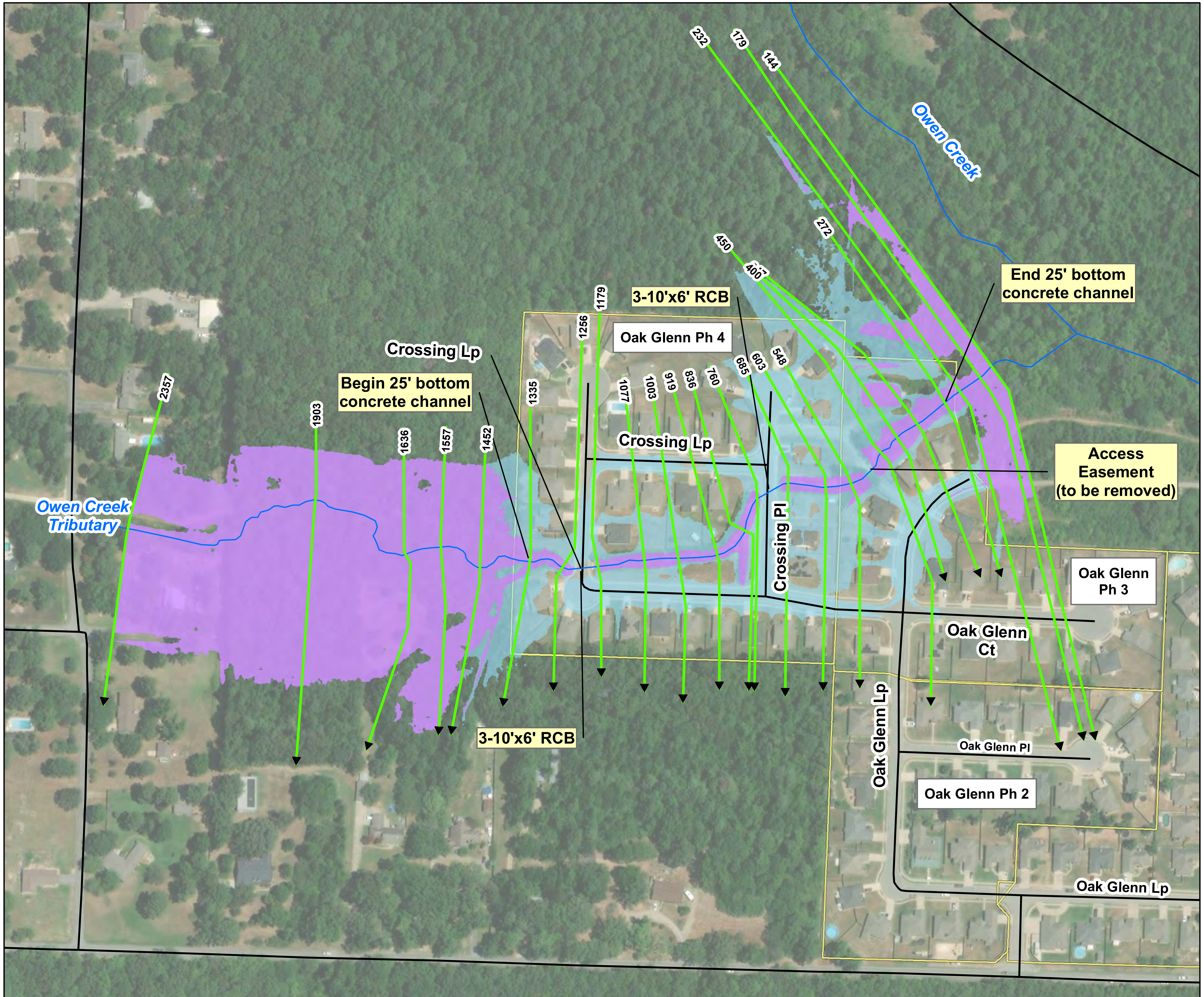
Parameter	Value
Channel Width	25 ft
Channel Height	6 ft
Chanel Shape	Rectangular
Channel Slope	0.01 ft/ft to 0.002 ft/ft
Channel Extents	100 ft upstream of Crossing Loop to 215 ft downstream of existing easement (1,050 ft total)
Other Features	Safety fence along creek banks

A comparison of existing and proposed water surface elevations during the 25-year event is given in Table 10. The proposed improvement design layout and floodplain boundaries are shown in Figure 10.

Table 10. Comparison of Existing and Proposed WSELs for 25-year event

Model Cross Section	Existing Conditions WSEL (ft NAVD88)	Proposed Conditions WSEL (ft NAVD88)	Difference in WSEL (ft)
2357	383.17	383.17	0.00
1903	380.07	380.07	0.00
1636	377.80	377.80	0.00
1557	377.17	377.17	0.00
1452	375.97	375.97	0.00
1335	375.64	372.69	-2.95
1256	373.57	371.92	-1.65
1216	Crossing Loop		
1179	373.60	371.14	-2.46
1077	372.46	370.12	-2.34
1003	371.75	369.49	-2.26
919	370.34	368.54	-1.8
836	370.17	367.71	-2.46
760	370.23	367.38	-2.85
732	Crossing Place		
685	370.12	366.66	-3.46
603	369.72	366.76	-2.96
548	369.73	366.82	-2.91
500	Access Easement		
450	369.27	366.79	-2.48
400	369.27	366.65	-2.62
347	367.31	366.5	-0.81
272	367.28	365.69	-1.59
232	365.69	365.68	-0.01
179	365.17	365.17	0.00
144	364.65	364.65	0.00

FIGURE 10. PROPOSED CONDITIONS MODEL MAP



- Model Cross Sections
- Streams
- Roads
- 25-Year Proposed Conditions Flood Boundary
- 25-Year Existing Conditions Flood Boundary
- Subdivision Boundary

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CITY OF BRYANT ARKANSAS

8.0 Conceptual Layout and Planning Level Opinion of Project Costs

A conceptual layout drawing and planning level opinion of project costs are provided in Appendix I-1. This layout is for graphical and planning purposes only and is not for construction.

9.0 Summary and Next Steps

In order to improve flood conditions in the Oak Glenn neighborhood, drainage improvements along Owen Creek Tributary are recommended. This includes the installation of new 3-10'x6' box culverts under Crossing Loop and Crossing Place, as well as channelization of the creek throughout the neighborhood with a 25-foot wide, 6-foot-tall rectangular concrete channel. For safety reasons, a fence is recommended along the channel banks throughout the neighborhood. Based on the hydraulic model results, the proposed drainage improvements decrease the likelihood of roadway and neighborhood flooding from approximately 99% annual chance event (1-year) to less than 4% annual chance event (25-year).

Prior to construction, a detailed design should be completed to optimize the layout while ensuring consistency with the parameters of the hydraulic model in this study. Due to the length of impacts to this USACE jurisdictional stream, a Section 404 Individual Permit will likely be required by USACE as well as the purchase of stream credits for compensatory mitigation.

Following construction of these proposed improvements, the City has requested that a Letter of Map Revision (LOMR) application be submitted to FEMA in order to map Owen Creek Tributary as Zone AE. Following construction, as-built survey of the proposed improvements should be collected and applied in the hydraulic model. A proposed floodway along the stream should also be developed prior to the LOMR application submittal. After updates to the model are performed, it can be submitted to FEMA for the map revision.

Appendix I-1

Phase 2

Oak Glenn Subdivision Improvements

Conceptual Layout and

Planning Level Opinion of Project Costs

CITY OF BRYANT
BRYANT, ARKANSAS
OAK GLENN CHANNEL
CONCEPT LAYOUT
GARVER
N
0' 20' 40' 80' 120'
(IN FEET)
END
0.20% CHANNEL SLOPE
CROSSING CT.
CROSSING LP.
CONSTRUCT
TRPL. 10' X 6' X 47' R.C. BOX CULVERT
END
1.00% CHANNEL SLOPE
25'
REMOVE EXIST.
GRAVEL RD.
BEGIN
0.20% CHANNEL SLOPE
CROSSING LP.
CROSSING PL.
35'
25'
OAK GLENN LP.
BEGIN
1.00% CHANNEL SLOPE
CONSTRUCT
TRPL. 10' X 6' X 50'
R.C. BOX CULVERT
OAK GLENN CT.
CONSTRUCT 25' X 6' RECTANGULAR CONCRETE
CHANNEL WITH SAFETY FENCING
CONCEPT LAYOUT
NOT FOR CONSTRUCTION

GARVER
4701 Northshore Drive
North Little Rock, AR 72118

TEL 501 .376 .3633
FAX 501 .372 .8042

www. Garver USA .com

PLANNING LEVEL OPINION OF PROJECT COSTS

Concept Design
Oak Glenn Channel Improvements
City of Bryant
March 21, 2023

Oak Glenn Channel Improvements

Channel

	Cost (per Lin Ft.)	Length (Feet)	Total Cost
Concrete Channel	$2,271	943	$2,140,000

Box Culvert

	[1] Cost (per Sq. Ft.)	Area (Sq. Ft.)	Total Cost
Triple Box Culvert	$145	3,217	$465,105
		Contingency (10%) =	$260,510
		Subtotal Construction Costs (2024) =	$2,865,615

Miscellaneous

	Percentage	Total Cost
[2] Planning and Engineering Services =	12%	$343,874
[2] Construction Engineering and Inspection Services =	10%	$286,561
[2] Stream Mitigation =	3.5%	$100,297
[2] Right-of-Way Cost =	3%	$85,968
[2] Utility Relocation Cost =	3%	$85,968
Subtotal Miscellaneous Costs (2024) =		$902,668

[3] **Total Opinion of Probable Planning and Construction Costs (2024) = $3,770,000**

Notes:

1. ArDOT 2021 Planning Estimate Escalated at 7.00% per Year
2. Detailed estimates are not available at this time. These percentage based estimates may vary from actual costs.
3. A conceptual layout has been performed for this projct at the time of this estimate. An effort has been made to include costs that are typical for this type of project, however, a full review of site specific costs has not been performed or included in this estimate.

Appendix J

Phase 2

Lea Circle near Hurricane Creek

Comprehensive Drainage Master Plan

City of Bryant

Phase 2

Lea Circle near Hurricane Creek

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January 2025

Garver Project No.: 20T20090

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1.0 Overall Project Description

A Comprehensive Drainage Master Plan (CDMP) is being developed for the City of Bryant. The purpose of the City of Bryant CDMP is to:

- Evaluate the existing drainage conditions of the City and Extra-Territorial Jurisdiction (ETJ), also known as the planning area;
- Identify current and future drainage problems;
- Generate proposed solutions to identified problems;
- Develop a Capital Improvement Plan (CIP); and
- Provide tools for managing future development.

The CDMP project is being performed in two (2) phases. Phases 1 and 2 will be divided into major tasks, with subtasks listed as applicable below these major tasks. **Figure 1** shows a flow chart of the overall project process.

- Phase 1: Data Collection and Initial Drainage Study Screening
- Phase 2: Survey Collection, Hydrologic and Hydraulic Modeling, Identification of Drainage Problems, Alternative Development, and CIP Development

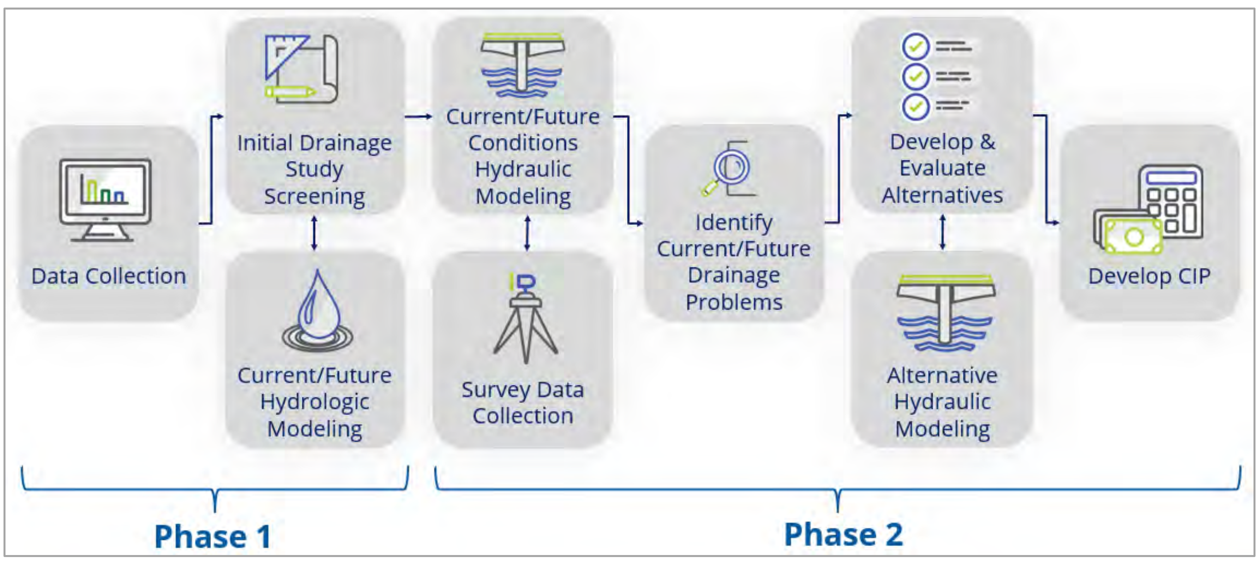


Figure 1. CDMP Project Process

This report discusses the processes and findings of a Phase 2 study for Lea Circle near Hurricane Creek.

2.0 General Information

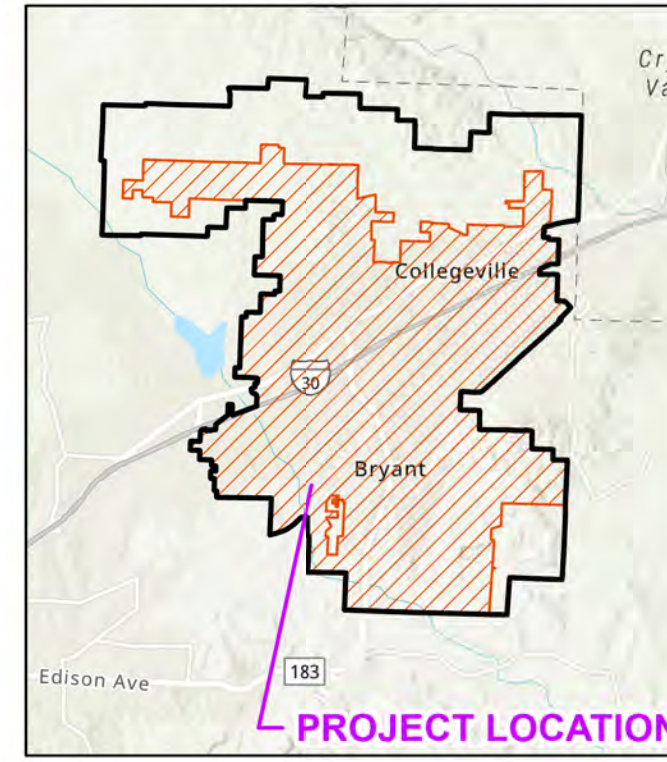
Lea Circle is a local road located just off of Boone Road east of Hurricane Creek. Several homes along Lea Circle have experienced reported flood losses due to flooding along Hurricane Creek and Boswell Creek. The project location map is shown in **Figure 2**.

3.0 National Flood Insurance Program (NFIP) Data

The City of Bryant participates in the FEMA National Flood Insurance Program (NFIP). Current floodplain information and mapping is available in Flood Insurance Study (FIS) Report numbers 05125CV0001B and V0002B for Saline County, Arkansas, and Incorporated Areas. The City is mapped within Flood Insurance Rate Map (FIRM) Panels 0225E, 0240E, 0360E, 0370E, and 0380E. The project area of Lea Circle near Hurricane Creek is within FIRM panel 0360E. Hurricane Creek is mapped as Zone AE with floodway, and Boswell Creek is mapped as Zone AE. The Effective floodplain mapping for the project area is shown in Error! Reference source not found..

As shown in Figure 3, twelve residential structures are located within the Zone AE floodplain. This count does not include any detached garages, sheds, or other outbuildings located on the properties. One residential structure is located within the regulatory floodway of Hurricane Creek.

FIGURE 2.
PROJECT LOCATION MAP



Legend

- Roads
- PROJECT LOCATION
- STREAMS

N
W E
S

0 250 500 Feet

NAD83 State Plane Arkansas South

CITY OF BRYANT ARKANSAS

GARVER

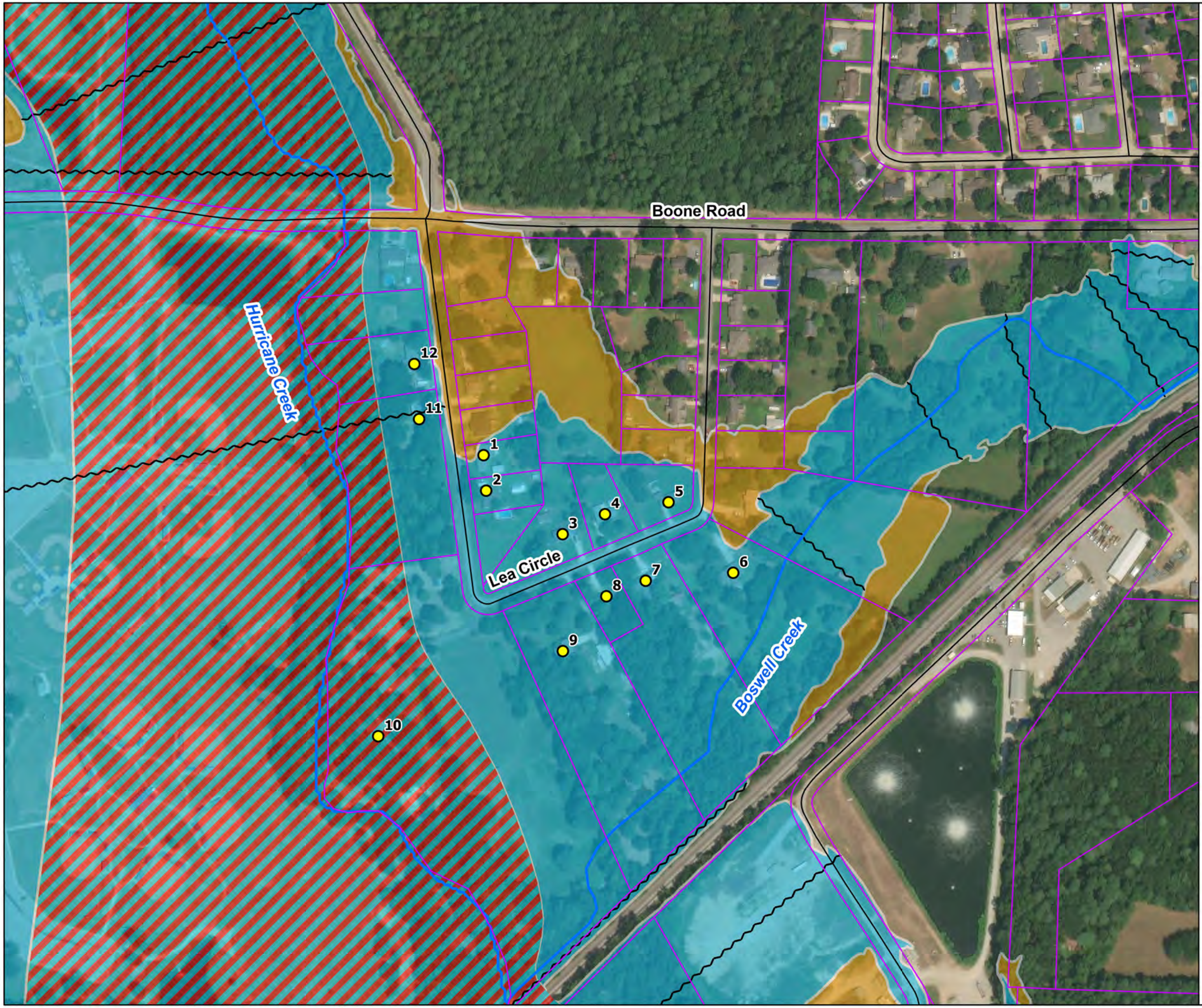
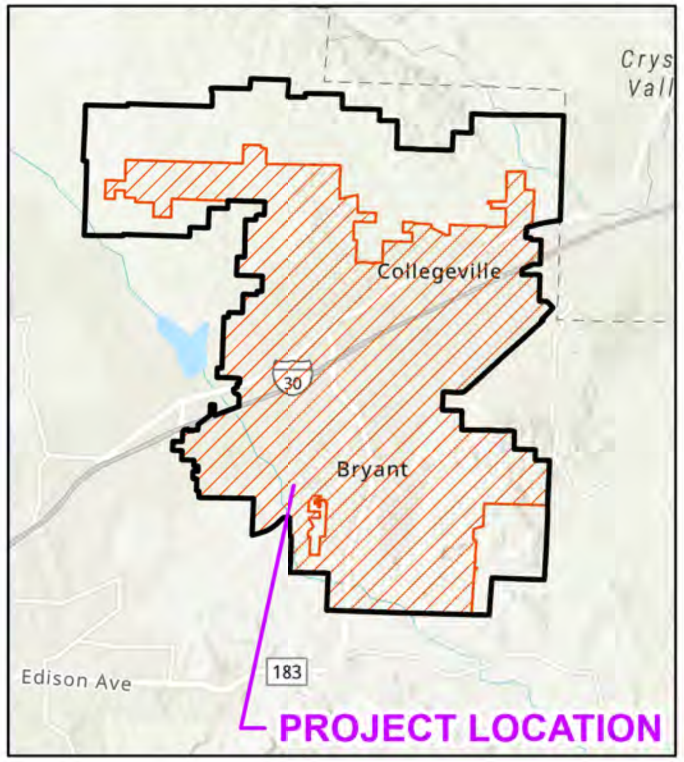


FIGURE 3.
PROJECT FLOODPLAIN MAP



Legend

- Residential Structures within Floodplain
- Saline County Parcels
- Base Flood Elevations*
- Effective 1% Annual Chance Flood Hazard*
- Effective Floodway*
- Effective 0.2% Annual Chance Flood Hazard*

*Digital National Flood Hazard Layer (NFHL) data acquired from the FEMA Map Service Center for Saline County, Arkansas. 05125C0360E and 05125C0380E dated effective 06/05/2020.

N
W E
S

0 250 500 Feet

NAD83 State Plane Arkansas South

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4.0 Data Collection

4.1.1 Resident Comment Database

For this CDMP, a public comment period was issued to allow city residents to submit drainage issues. The comment period ran from April 10 to May 22, 2022. A total of 264 comments were received for the city planning area. Three resident comments were received on Lea Circle. All three comments mention water over the roadway during flood events with damage to outbuildings, fences, and yards.

5.0 Initial Screening Study

During Phase 1, an Initial Screening Study was performed for the Hurricane Creek basin. For this screening, a hydraulic model was developed for the entire basin using 2D HEC-RAS and utilized rain-on-grid methodology to apply precipitation directly to the ground surface. This model was used to identify flood issues throughout the City, so is considered a qualitative model and not to be used for design. However, the data is useful in determining relative flood risk, and a flood severity index (FSI) was developed using the model results. Flood severity ranges from 0 to 4, with 4 being the most severe. The FSI classifications are listed in **Table 1**. **Table 2** displays the FSI rankings for Owen Creek.

Table 1. Flood Severity Index Classes

Class	Description	Maximum Flood Depth (ft)	Maximum Flood Velocity (ft/s)
FS0	Minimal severity	< 0.5	-
FS1	Unsafe for vehicles and pedestrians	< 1.5	< 6.0
FS2	Moderate flooding hazard for buildings	< 3	< 6.0
FS3	Potential for structural damage	> 3	< 6.0
FS4	Unsafe for vehicles and pedestrians; Potential for structural damage	> 0.5	>6.0

Because of the high likelihood of flooding at multiple storm events, and historical flood issues in the area, Midland Road and Hilldale Road were selected for further hydraulic study in order to identify conceptual drainage improvements.

Table 2. Flood Severity Index for Lea Circle

Location	Stream Name	Basin	Potential Drainage Issue	Flood Severity Index			
				5 yr	10 yr	50 yr	100 yr
Lea Circle	Hurricane and Boswell Creeks	Hurricane Creek	Roadway overtopping; home flooding	3	3	3	3

6.0 Proposed Drainage Solution

The floodplain at Lea Circle cannot be substantially decreased in size due to the railroad crossing downstream. This railroad crossing is causing significant backwater that cannot be minimized without improvements to the railroad bridges. Coordination with railroad companies is arduous and complex, therefore, improvement of the railroad bridges is unlikely.

Because of the likelihood of repetitive losses to the properties located in the floodplain, a potential solution would be for the City to buy out these properties. A list of the properties and their estimated values are provided in Table 4. These values were acquired online. Prior to property buyout, elevation certificates for each property should be completed to determine if a Letter of Map Amendment (LOMA) can be completed for the property. If structure elevations are adequate, a LOMA could remove structures from the floodplain and remove the requirement for flood insurance. Properties able to meet the requirements for a LOMA would not need to be bought out by the City. Additionally, each property should be formally assessed to determine actual property value. Note: the property located at the corner of Boone Road and W. Lea Circle was not included in the potential buyout list because it has already been removed from the floodplain via a LOMA.

Table 3. Estimated Property Values

Map ID	Property Address	Estimated Value*
1	207 W. Lea Circle	$179,300
2	211 W. Lea Circle	Not Available
3	1702 S. Lea Circle	$140,100
4	1610 S. Lea Circle	$147,700
5	1602 S. Lea Circle	$136,900
6	1601 S. Lea Circle	$364,200
7	1609 S. Lea Circle	$284,100
8	1613 S. Lea Circle	$177,000
9	1705 S. Lea Circle	$412,000
10	1713 S. Lea Circle	$626,100
11	200 W. Lea Circle	$163,200
12	112 W. Lea Circle	$193,900

* Estimated values obtained from Zillow.com in December 2024; values are subject to change based on market fluctuations.

7.0 Planning Level Opinion of Project Costs

A planning level opinion of project cost is provided in Appendix J-1. As mentioned in Section 5, in order to determine actual property value, each property should be formally assessed.

Appendix J-1

Phase 2

Lea Circle Buyout

Planning Level Opinion of Project Costs

Planning Level Opinion of Project Costs Lea Circle near Hurricane Creek				
Item Description	Unit	Quantity	Unit Cost	Total Cost
207 W. Lea Circle[1]	L.S.	1	$ 179,300.00	$ 179,300.00
211 W. Lea Circle[2]	L.S.	1	$ 257,000.00	$ 257,000.00
1702 S. Lea Circle[1]	L.S.	1	$ 140,100.00	$ 140,100.00
1610 S. Lea Circle[1]	L.S.	1	$ 147,700.00	$ 147,700.00
1602 S. Lea Circle[1]	L.S.	1	$ 136,900.00	$ 136,900.00
1601 S. Lea Circle[1]	L.S.	1	$ 364,200.00	$ 364,200.00
1609 S. Lea Circle[1]	L.S.	1	$ 284,100.00	$ 284,100.00
1613 S. Lea Circle[1]	L.S.	1	$ 177,000.00	$ 177,000.00
1705 S. Lea Circle[1]	L.S.	1	$ 412,000.00	$ 412,000.00
1713 S. Lea Circle[1]	L.S.	1	$ 626,000.00	$ 626,000.00
200 W. Lea Circle[1]	L.S.	1	$ 163,200.00	$ 163,200.00
112 W. Lea Circle[1]	L.S.	1	$ 193,900.00	$ 193,900.00
Contingency (20%)	L.S.	1	$ 616,280.00	$ 616,280.00
Total Estimated Project Cost				$ 3,697,700.00

[1] Estimated values obtained from Zillow.com in December 2024; values are subject to change based on market fluctuations

[2] Estimated value is not available; an average price was used for the unit cost