Repetitive Loss Area # 26

East and West Branch of Joe Creek
E. 49th St. & S. Harvard Ave. Area

August 17, 2017

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Planning Consultants

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Engineering Services

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August 17, 2017

Dear Resident/Property Owner:

Once considered the most flood-prone city in America, Tulsa has worked hard to reduce or eliminate flooding of its homes and neighborhoods. The City joined the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP) in 1974 and through decades of effort is now recognized as a national leader in flood hazard mitigation. As a result, property owners in Tulsa receive as much as 40% discount on their flood insurance.

A key component of the NFIP has been its focus on Repetitive Loss Properties, which make up only 1 percent of insured properties, but account for over 30 percent of flood insurance claims payments. A Repetitive Loss Property is defined by FEMA as any property that has been paid two or more flood insurance claims of $1,000 or more in a 10-year time period.

The NFIP recently expanded its flood hazard mitigation program to include the identification of "Repetitive Loss Areas" (RLA)—those properties near an existing Repetitive Loss Property that may be subject to the same general flooding conditions. In most instances, 95% of the properties in an RLA will never have experienced flooding—especially if the cause of damage is shallow, overland flow due to local drainage conditions. Once the City has identified an RLA, we are required to contact the owners and residents of the area and work together to develop a plan to reduce or eliminate flooding in the neighborhood.

Your property has been identified as being in an Repetitive Loss Area. We want to re-emphasize that this does not mean your property has flooded or is even likely to flood—only that it is in the same area, and in a similar geographical situation, as an existing Repetitive Loss Property.

You can protect your property from flooding. We would like to invite you to participate in our flood prevention and mitigation efforts for your neighborhood. We need your input. What can we do, working together, to eliminate potential flood losses in your area? We look forward to hearing from you.

To learn more about your risk of flooding visit www.floodsmart.gov or contact the City of Tulsa Customer Care Center at (918) 596-7777.

Sincerely,
CITY OF TULSA, ENGINEERING SERVICES

Bill Robison

Bill Robison, P.E., CFM
Senior Special Projects Engineer
Stormwater Project Coordination

Contents

Acknowledgements

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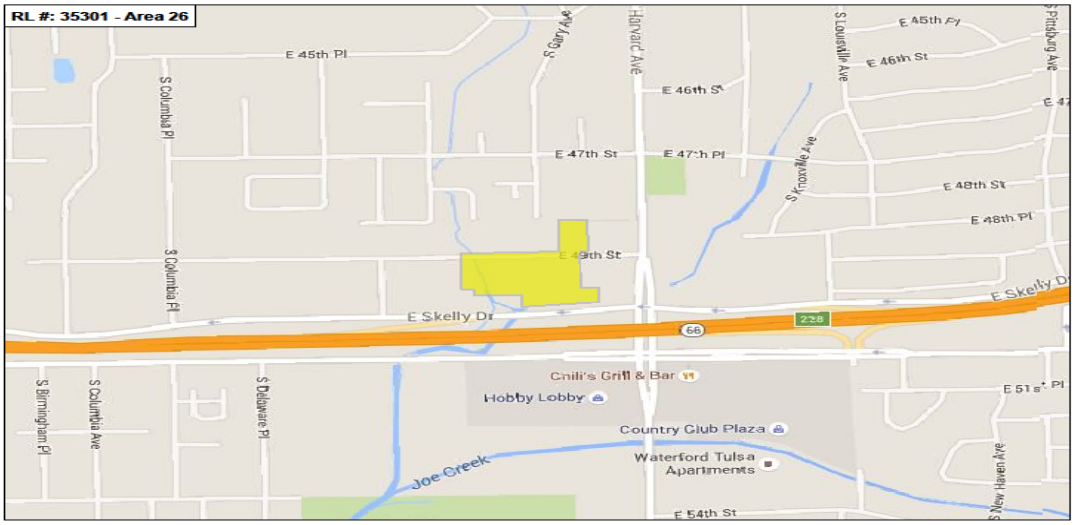
Repetitive Loss Area # 26

East Branch of Joe Creek
E. 49th St. & S. Harvard Ave. Area

Overview

Repetitive Loss Area (RLA) #26 is located on the north side of E. Skelly Dr. and I-44, between S. Florence Ave. on the west and S. Harvard Ave. on the east. The RLA is at the junction of the West and East Branches of Upper Joe Creek, about 4 miles above where the creek joins the Arkansas River. There are three developed properties in the RLA, including one Repetitive Loss Property: one two-story multi-family apartment complex, a two-story motel, and a six-story office building. The first floors of all three structures are essentially slab-on-grade. All three properties are also situated within the floodway of Upper Joe Creek and within FEMA's SFHA and the City of Tulsa's Regulatory Floodplain. In 1979, 1980 and 1984 overland flow and backup flooding on the West and East Branches of the creek resulted in five flood damage claims from four properties (there were two separate claimants from within the apartment complex) totaling $58,024. The claims averaged about $11,500 and ranged from a low of $642 to a high of $22,931. There has been no backup flooding in this stretch of Joe Creek since channel modifications and storm sewer enlargements were completed by the US Army Corps of Engineers and the City in the 1980s and 1990s.

The general location of RLA #26 is shown on the map below and on the more detailed photo/topography map on page 5. The detailed map identifies properties, County Assessor parcels, floodplains, and the existing storm sewer system.



RLA #26 is located in the West Branch of Joe Creek drainage on the north side of Skelly Dr. and I-44, generally between S. Florence Ave. and S. Harvard Ave.

I. Background

During the post-World War building boom of the 1950s and 1960s, Tulsa expanded rapidly east and south into the basins of Mingo and Joe creeks. Because of the city's climate and the broad floodplains along these creeks this growth brought with it an increased risk of flooding. And indeed, by the mid-1980s floods were occurring almost yearly and flooding had become Tulsa's most destructive natural hazard. One researcher at the time declared Tulsa "the most flood-prone community in the nation."

Tulsa was not unique in its rapid post-war development and attendant risks. Cities across America were experiencing similar problems as they spread out into prosperous subdivisions. In response, the U.S. Congress created the National Flood Insurance Program (NFIP) in 1968 to help property owners protect themselves from flood losses. The NFIP offered flood insurance to homeowners, renters, and business owners if their community participated in the NFIP and agreed to adopt and enforce ordinances that met or exceeded FEMA requirements for reducing the risk of flooding.

Tulsa joined the NFIP in 1974, and through great effort and considerable expense has significantly reduced its exposure to flooding. As a result, Tulsa has been awarded a Class II rating in the NFIP's Community Rating System (CRS), which grants its residents a 40 percent discount on the cost of flood insurance for structures in the Special Flood Hazard Area (SFHA), also known as the 1% or 100-year floodplain. Since the Biggert-Waters Flood Insurance Reform Act of 2012, many properties have seen a substantial increase in their premiums, making this discount even more important.

For its part, the NFIP is continually faced with the job of paying claims while trying to keep the price of flood insurance at an affordable level. Properties that flood repeatedly—known as "Repetitive Loss Properties," have been a particular problem for the program: Although they make up only 1 percent of insured properties, they account for one-third of all claims payments (about $200 million a year, or $4.5 billion to date). A Repetitive Loss Property is defined by FEMA as any property that has been paid two or more flood insurance claims of $1,000 or more in a 10-year time period.

Consequently, one of the requirements of the CRS is that communities identify all Repetitive Loss Properties in their jurisdiction and work with the owners to find ways to reduce or eliminate future flood damage. This initiative has been very successful in reducing flood losses and claims.

FEMA has recently extended its repetitive loss program to include "Repetitive Loss Areas" (RLA). To maintain a Class II rating in the CRS, Tulsa is now required to analyze the area surrounding each of its Repetitive Loss Properties and identify any neighboring properties (including uninsured ones) that may be subject to the same general flooding conditions. This group of nearby properties is then designated as an RLA. The City is required to contact the owners of the properties in all its RLAs, inform them that they are located in an area subject to flooding, and develop a plan for mitigating or eliminating flooding in the area, much as is being done for the individual Repetitive Loss Properties.

It is important to note that most of the homes in a Repetitive Loss Area—perhaps as many as 80% or 90%—may not have experienced flooding of any kind. What they have in common is being subject to the same general geographical and flood conditions as the nearby repetitive loss property. It should also be stressed that the flooding events in

question may have had little or nothing to do with overflow from a creek, but perhaps been the result of storm sewer backup or overland flow from a neighbor's property into a low-lying, slab-on-grade home or garage.

II. Location

Joe Creek is about 6.5 miles in length and drains an area of 13.7 sq. miles in southeast Tulsa. The creek has several tributary branches (East and West Joe Creek, Little Joe and South Joe) that converge near E. 53rd and S. Evanston Ave., at Manion Park, just north of Eisenhower International School, to form lower Joe Creek mainstem. The mainstem and its tributaries have been channelized through much of their lengths.

Upper Joe Creek has two branches: West Branch and East Branch. The West Branch rises near E. 23rd St. and S. Oswego Ave. and flows south for about 3 miles to join the East Branch at Skelly Dr. and I-44, and then the mainstem at Manion Park. Almost all of the West Branch is underground. The creek surfaces at E. 28th St. and S. Florence Ave. as the source of Lakewood Lake, and again briefly between E. 33rd and E. 36th St. before returning underground until it surfaces between E. 49th St. and Skelly Dr. to finally merge with the East Branch under I-44, just west of Harvard Ave.

The West Branch of Joe Creek emerges from underground in RLA #26 and passes under the Skelly Dr. and I-44 just west of Harvard Ave. to join with the East Branch beneath I-44.

The East Branch of Joe Creek has its origins in several tributary streams that flow for about 3 miles south southwest from high ground along the Broken Arrow Expressway—beginning near E. 25th and S. Quebec Ave., at E. 26th and S. Yale Ave., at E. 32nd and S. Darlington, and at 38th and S. Hudson Ave. These tributaries flow underground in storm sewers for most of their lengths, to occasionally emerge as small neighborhood amenity streams or lakes, such as Mockingbird Lake near E. 36th and S. Yale Ave., and the creek and small lake on the grounds of Methodist Manor between E. 31st and 33rd and S. Sandusky Ave. The East Branch emerges fully from underground near 46th Pl. and S. Louisville Ave., where it is channelized until its junction with the West Branch under Skelly Dr. and I-44.

RLA #26 is situated at the junction of the West and East Branches of Upper Joe Creek. The three structures that comprise the RLA have first finished floor elevations at between 661.9 and 664.2 ft., while the Base Flood Elevations in this reach of Joe Creek are between 662 and 664 feet.

III. History

Development

The properties of RLA #26 were developed between 1970 and 1975, although some homes in the neighborhood were built as early as the 1940s and 1950s. The Skelly Bypass (now I-44) was completed in 1956. The construction of the commercial complex that stretches along the north side of Skelly Dr., and which includes two of the three buildings in RLA #26, filled in much of the natural drainage in the immediate area. The streets in the neighborhood, except for Harvard Ave. and Skelly Dr., are generally without curbing and runoff is carried via bar ditches to culverts along E. 49th St.

Flooding

There was significant flooding on Joe Creek in October 1959, May 10-11, 1970 (Mothers Day flood), June 7-9, 1974, May 31, 1976 (Memorial Day flood), June 21, 1979, June 17, 1980, May 27, 1984 (another Memorial Day flood), August 11, 1992, May 7, 1993, July 1994, May 6, 2000, May 8, 2007, and May 20, 2010. According to newspaper reports, flooding was particularly bad on Joe Creek in 1974 and 1976, although not necessarily along this reach. The storms that resulted in the five damage claims in RLA #26 totaling $58, 024 were in 1979, 1980 and 1984.

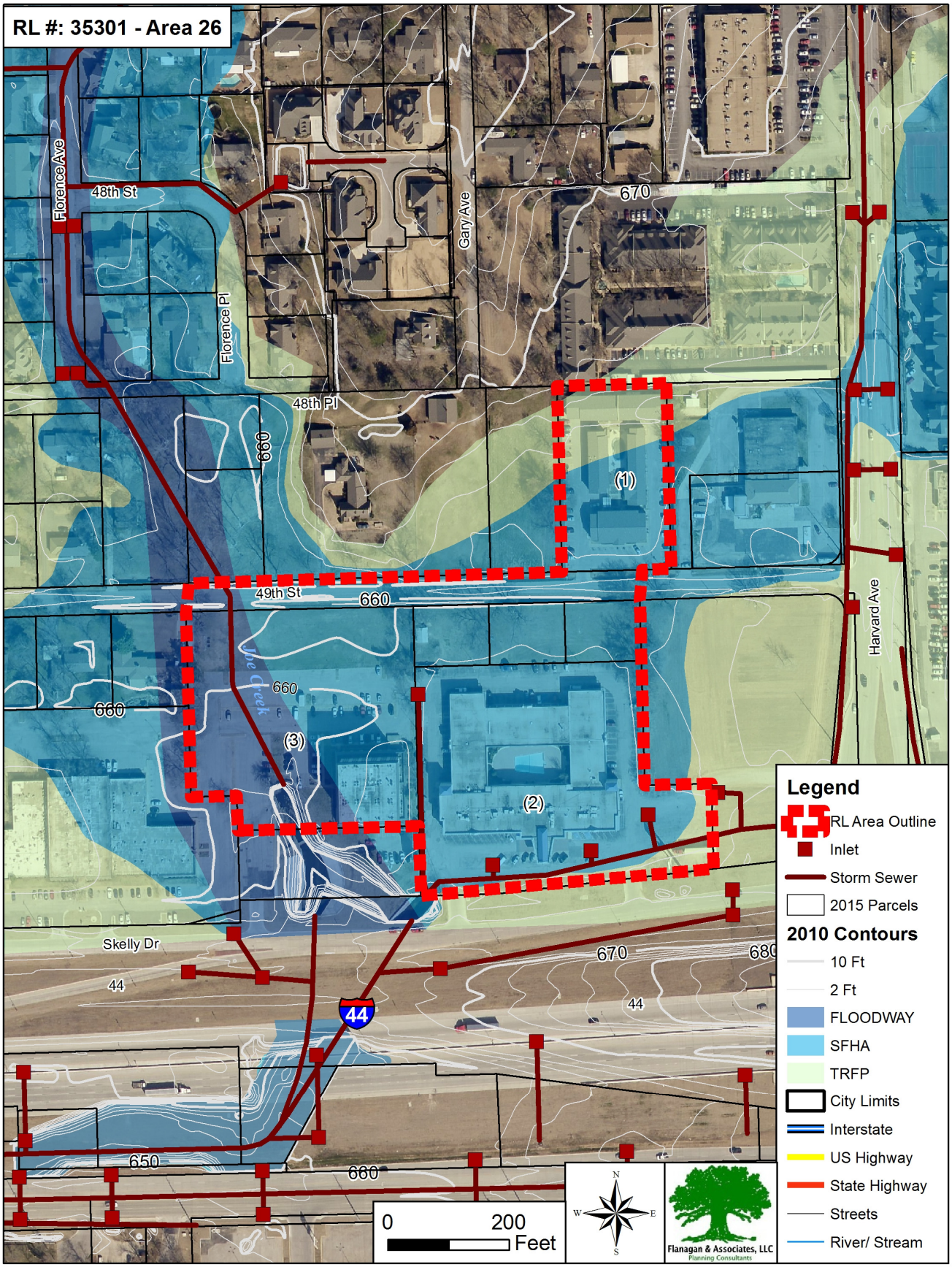
The greatest contribution to flooding in RLA #26 were undersized storm sewers, overland flow along the gentle swales that generally followed the alignment of the original creek beds, and backup flooding behind the undersized box culverts beneath Skelly Dr. During exceptionally heavy downpours, such as the 300-year rainfall event in May 1984, main thoroughfares were inundated, bar ditches overfilled, and low-lying, slab-on-grade structures flooded.

Improvements

Improvements to the Joe Creek channel by the City and the US Army Corps of Engineers in the 1970s and 1980s channelized a good deal of Joe Creek and its tributaries and installed parallel storm sewers along much of Joe Creek's East and West Branches. In the 1990s the City enlarged the storm sewer system in the Joe Creek drainage to solve chronic backup problems at numerous locations, including the box culverts under the Skelly Bypass. The expansion of I-44 in 2010-2012 further increased drainage beneath the I-44. These improvements have virtually eliminated flooding in RLA #26, as evidenced by there having been no flood damage claims in the immediate area since 1984.

IV. Research and Analysis

The analysis of Repetitive Loss Area #26 was conducted by the Project Team through interviews with City officials, research into Engineering Services and Stormwater Drainage files, including the Joe Creek Master Drainage Plan, review of the City's extensive flood history documentation, assessment of insurance claims, field trips to the RLA, interviews with home owners and questionnaires mailed to owner and residents soliciting information about prior and existing flooding issues, if any.


RL #: 35301 - Area 26
Florence Ave
48th St
Florence Pl
48th Pl
Gary Ave
670
660
(1)
49th St
660
Harvard Ave
Joe Creek
660
660
(3)
(2)
Skelly Dr
670
680
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Flanagan & Associates, LLC
Planning Consultants
Legend
RL Area Outline
Inlet
Storm Sewer
2015 Parcels
2010 Contours
10 Ft
2 Ft
FLOODWAY
SFHA
TRFP
City Limits
Interstate
US Highway
State Highway
Streets
River/ Stream

Agencies and Organizations

The City of Tulsa's Storm Drainage & Hazard Mitigation Advisory Board (SDHMAB), which also serves as the City's Hazard Mitigation and CRS Committee, and the CRS Public Participation Involvement & Information Committee (PPI) met monthly during the two-year Repetitive Loss Area Planning process. Each committee was updated on the status of the planning process, discussed issues, and provided guidance. Research and analysis were done in accordance with guidelines from the Federal Emergency Management Agency (FEMA), the National Flood Insurance Program (NFIP) and the Community Rating System (CRS).

Local, State & Federal Agencies and non-profit organizations are represented on the PPI Committee. The RLA plans were discussed at the PPI Committee meetings, and other agencies such as TAEMA were contacted by phone or email. The RLA plans were presented to City Council for adoption; the agenda was made public and furnished to the media. The council meeting is a public meeting and the local media was present at the meeting. In addition the council meetings are aired on our local government network TV channel TGOV.

Participating agencies and organizations involved were: City of Tulsa (CoT) Storm Drainage & Hazard Mitigation Advisory Board, CRS PPI Committee, CoT Communications Department, CoT Development Services, Working in Neighborhoods, CoT Engineering Services, CoT Finance Department, CoT Legal Department, CoT Streets & Stormwater, CoT Water & Sewer Department, Child Care Resource Center, Indian Nations Council of Governments, Tulsa Area Emergency Management Agency (TAEMA), Disaster Resilience Network, Metropolitan Environmental Trust, Oklahoma Insurance Department, Tulsa Association of Realtors, U.S. Army Corps of Engineers.

Plans, Studies and Documents

The following City of Tulsa and FEMA documents were used in the analysis:

- *Flood Insurance Rate Map*, City of Tulsa, October 16, 2012
- *Regulatory Floodplain Map Atlas*, Tulsa Engineering Services, October, 2016
- *2014 City of Tulsa Hazard Mitigation Plan Update*, Flanagan & Assoc., 2014
- City of Tulsa *Stormwater Management Plan*
- Stormwater Design Criteria Manual: Critical Neighborhood Flood Control Projects
- Stormwater Capital Improvements List, City of Tulsa, Engineering Services
- *Joe Creek Flood Survey and Study*, Owen, Mansur & Steele, 1955
- *Joe Creek East and West Branches Master Drainage Plan, Interim Report*, W.R. Holway & Assoc., March 1988
- *Guidebook to Conducting Repetitive Loss Area Analyses*, UNO and FEMA

Capital Improvements Plans

No City of Tulsa Capital Improvements are currently planned that could have a positive impact on the flooding problems in Repetitive Loss Area # 26. There are storm sewer improvement and regional detention facilities on the existing CIPs for Joe Creek along

with Master Drainage Plan recommendations that are not yet on the CIPs. None are presently funded.

Flood Insurance Data

Six properties in the RLA currently carry flood insurance, including four apartment units.

Claims Data.

Between 1979 and 1984 clogged/inadequate bar ditches, overland flow, backup flooding upstream from Skelly Bypass, and low-lying, slab-on-grade structures generated five damage claims from three properties totaling $58,024. There was one claim in 1979, one in 1980 and three in 1984. On all three occasions, heavy rain (over 4 inches, 6-10 inches and 6-13 inches in 1979, 1980 and 1984, respectively) resulted in widespread street flooding in South Tulsa and in the Joe Creek basin. Because the Privacy Act of 1974 (5 USC 522a) restricts the release of flood insurance policy and claims data to the public, neither the Repetitive Loss Property nor specific claim data are detailed in this Plan.

Field Surveys and Site Visits

Site visits were conducted during the study, primarily to confirm foundation type and view local on-site overland flow drainage patterns.

Review Drainage Patterns.

The Project Team examined aerial topography maps, master drainage plans, storm sewer plans, City Customer Care Center complaints and comments, and conducted field checks to determine area drainage patterns and identify flood problem areas. The results of the research and analysis are described in the following paragraphs and summarized in the table below.

Structures

The Project Team has made numerous visits to RLA #26 to determine the situation and condition of the structures. On-site, visual analysis was verified by queries of Tulsa County Assessor data.

Structure Type.

The structures in RLA #26 are a two-story apartment complex, a two-story motel, and a multi-story office building.

Foundation Type.

The types of foundations were determined by field investigation and query of Tulsa County Assessor records. The foundations of all three buildings are essentially slab-on-grade.

Condition of Structures.

The condition of the structures in the RLA was determined by field investigation and a search of the County Assessor's records. All three structures are in Average condition. These findings are summarized in the following table.

Properties in the RLA

Address	Structure Type	Foundation Type	Year Built	Condition
Property 1	Apartments	Slab-on-grade	1970	Average
Property 2	Motel	Slab-on-grade	1970	Average
Property 3	Office Building	Slab-on-grade	1975	Average

Notification

Annual Floodplain Notification. Each year, in March, the City notifies all homeowners and residents living in a 100-year floodplain that their properties are subject to flooding and informs them of what steps they can take to protect their residences, businesses and families, including the purchase of flood insurance.

Annual Repetitive Loss Area Notification. Residents and property owners in Repetitive Loss Area #26 are notified annually that their properties are located in a Repetitive Loss Area, and are potentially subject to flood damage from overland flow, clogged bar ditches, and storm sewer back-up.

Property Owners/Residents Notification. Property owners and residents/occupants were advised of the Repetitive Loss Area study and analysis by letter, were sent a questionnaire soliciting information and input, and asked to contact the City for more information or a copy of the completed RLA Plan.

Public Participation and Involvement. City Staff/Consultants interviewed homeowners to brief them on the Repetitive Loss Area Analysis Study/Plan, receive their input, and discuss possible mitigation measures.

Property Owner Response to Notifications. There have been no contacts from property owners in RLA #26 to the City in recent years concerning flooding: As of June 17, 2016, there have been no responses from property owners or residents of RLA #26 to notifications about the Repetitive Loss Area designation.

Conclusions

RLA #26 is in the Upper Joe Creek drainage, at the junction of the creek's East and West Branches—on the north side of E. Skelly Dr. and just west of S. Harvard Ave. There are three developed properties in the RLA: a two-story apartment complex, a two-story motel, and a multi-story office building. There is one Repetitive Loss Property in the RLA which has made three claims totaling $19,851. The causes of flooding have been very heavy rainfall (the 1984 flood, for example, was the result of a 300 to 400-year frequency event), undersized storm sewers—particularly beneath Skelly Dr. (I-44), overland flow along the swales of the old creek beds, and the slab-on-grade foundations of the three buildings. There has been no significant flooding in this stretch of Joe Creek since channel modifications and storm sewer improvements were completed by the US Army Corps of Engineers and the City in the 1980s and 1990s. The expansion of I-44 significantly increased the size of the box culverts beneath I-44, which in the past have acted as a constriction. Nevertheless, all three properties are situated within the floodway of the East and West Branches of Joe Creek and within FEMA's SFHA and the City of Tulsa's Regulatory Floodplain. The first finished floor elevations of the three structures are 661.9, 663.1 and 664.2 feet, while the Base Flood Elevation in the RLA is between

662 and 665 feet. In the Master Drainage Plan for the East and West Branches of Joe Creek, completed in 1988, the engineering firm that conducted the study cautioned that even if all the storm sewers were enlarged according to the Plan, there would still be flooding if the drainage basin experienced rainfall similar to that which caused the 1984 flood.

V. Mitigation Measures

Overview

The Master Drainage Plan for Joe Creek identifies the most cost-effective structural solutions (channel improvements, enlarged inlets and storm sewers, stormwater detention ponds) for the area. The Non-Structural Plan identifies buildings where a structural solution is not cost-effective, and acquisition is the recommended solution.

Individual property protection actions are usually undertaken by property owners on a lot-by-lot, building-by-building basis, and include private floodproofing, moving mechanical equipment above flood levels, installing French drains and minor site grading to move local drainage to the street, sewer backup protection, and flood insurance. Dry floodproofing is sometimes recommended for commercial structures.

Individual Flood Protection Measures: What You Can Do

Individual property protection actions are usually undertaken by property owners on a lot-by-lot, building-by-building basis, and include private floodproofing, moving mechanical equipment above flood levels, installing French drains and minor site grading to move local drainage to the street, sanitary sewer backup protection, and flood insurance.

The City of Tulsa is willing to have a stormwater engineer do a site visit to assist you in analyzing your specific drainage problems and discuss potential solutions. Contact the Customer Care Center at (918) 596-7777, or go online to www.cityoftulsa.org/connect/contact-the-city.

This platform and wall protect the home and air conditioning equipment from shallow flooding.

Know and Understand Your Flood Risk. As stated above, being located in a Repetitive Loss Area does *not* mean a property will flood. Nevertheless, it is important that residents and property owners in flood hazard areas know and understand their flood risk and take what steps they can to protect their homes, families and possessions. City staff is available to explain the local flood risk, interpret floodplain maps, and determine if an area or property has drainage problems or a history of prior flooding. Staff can also discuss the ways a specific property can be protected from flooding. An Elevation Certificate can

help define a property's flood risk under various rainfall scenarios (e.g., in a 10-year, 50-year, 100-year, or 300-year storm). You can receive a free flood zone determination by contacting the City with the correct legal description and street address, or the Tax Assessor/Parcel Number of the property.

Make a Disaster Preparedness Plan. It is always a good idea for residents and property owners in flood hazard zones to prepare a disaster preparedness and response plan that addresses all the steps and details that will demand attention once a flood watch or warning is issued. A Building Permit is required to install a safe room in a flood-prone area.

Create Berms, Swales or Redirected Drainage. Flood waters can be diverted away from structures using berms, brick planter boxes and swales, but these may not be done in ways that cause damage to other properties. Owners and residents can request a meeting with a City Engineer to discuss the best ways to solve existing drainage problems, and whether a Building Permit will be required. Contact the Customer Care Center at (918) 596-2100. This is the most feasible solution for areas with flooding due to overland flow, such as RLA #26.

Install Local, Property-Specific Paving, Plantings and Catchment Basins. City Engineering staff can explain the natural functions of floodplains and how they act to slow and purify urban runoff and reduce flooding. Staff can also suggest low-impact development projects which imitate natural floodplain functions by slowing runoff and filtering out impurities. These include such things as rain gardens, catchment basins and pervious paving materials.

Acquisition. The City of Tulsa has a repetitive loss acquisition program to purchase repeatedly flooded properties. This voluntary program offers owners who are in this situation a way out. The City applies to FEMA for funds using the Hazard Mitigation Grant Program. Once the grant is awarded, the property is appraised as if it were not a flooded property and the offer for the property is based on this appraisal. In addition to getting the best possible price, the owner receives moving expenses, a $1,000 stipend for purchasing a home outside the floodplain, and a 30-day rent free period after closing in which to move. All closing costs and other fees are paid by the City. Once the owner has moved out, the home is demolished and restored as open space to protect the natural and beneficial function of the floodplain. If you would like more information about this program contact the Customer Care Center at (918) 596-7777.

Acquisition is usually not feasible or cost effective for areas of shallow flooding, as in RLA #26. If a property is located in a FEMA Floodway or Special Flood Hazard Area, demolition, acquisition and relocation may be feasible and cost-effective.

Elevate Your Structure. Elevating the structure is only suitable for areas of shallow flooding, and is usually not feasible or cost-effective for masonry homes built on concrete slabs. It can sometimes be cost-effective for wood frame buildings on crawlspaces. None of the structures in RLA #26 is a candidate for elevation.

Dry Floodproof Your Structure. This can include actions that seal a structure and prevent floodwaters from entering. This method is best applied in areas where flood depths are no more than two or three feet. Buildings can be made watertight by sealing the walls with waterproof coatings, impermeable membranes, or additional layers of

masonry or concrete. Doors, windows, and other openings below the base flood elevation must also be equipped with permanent or removable shields, and backflow valves must be installed in sewer lines and drains. Dry floodproofing needs to be designed by an engineer to insure the structure can resist the force of the water.

Wet Floodproof Your Building. Wet flood-proofing allows water to enter a structure, while removing, protecting or elevating items that can be damaged, such as air conditioning equipment. This is often used on structures with crawl spaces and shallow flood depths. The City does not allow basements in flood-prone areas, or the wet floodproofing of basements.

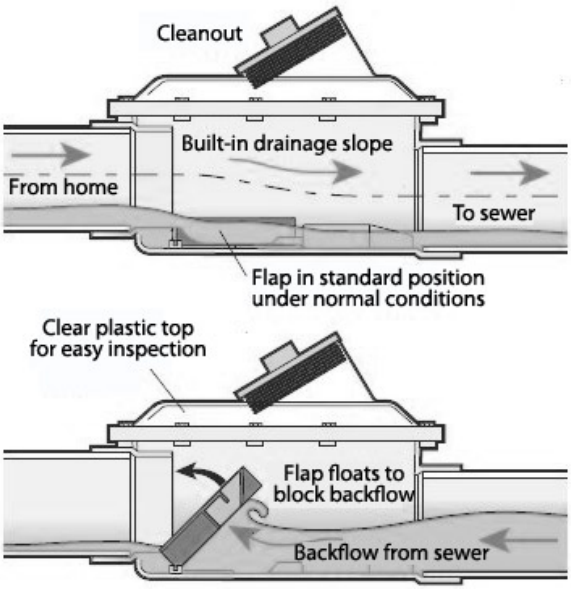
Wet Floodproof Your Garage. The garage, with its slab-on-grade construction, is one of the most vulnerable areas of your home to overland flow flooding. Remove, relocate, elevate, or otherwise protect items that can be damaged from flooding.

Elevate Damage-Prone Components such as furnace or air conditioning units. This should be done for components that are in the wet-floodproofed area of the building as well as for units that are outside of the structure but subject to shallow flooding.

Maintain Nearby Streams, Ditches, and Storm Drains. Local flooding can often be caused by brush and other debris blocking drainage ways and culverts. Although this is not at present a major problem for the West Branch of Joe Creek in this reach, in the past debris has blocked bar ditches and storm sewer inlets in RLA #26 and increased flood damage from overland flow. These must be kept free of debris. Residents and property owners should do their part in keeping inlets and drainage ways clear of brush and debris. Do not attempt to clear debris during a flood event.

Correct Sanitary Sewer Backup Problems. Sanitary sewer backup can be a cause of home damage in low-lying, flood-prone areas like RLA #35. The installation of backflow prevention valves on your sanitary sewer lines is highly recommended.

Purchase and Maintain Flood Insurance. Flood Insurance is available and recommended for all properties in Tulsa. A large percentage of all flood insurance claims are for properties that are outside the FEMA floodplain. Because of the City of Tulsa's sustained efforts to reduce flooding, property owners are entitled to a discount on your flood insurance. A property does not have to be in a floodplain to qualify for flood insurance.



Sewer backflow prevention valves are essential components for homes in low-lying, flood-prone areas.

Repetitive Loss Area Mitigation Measures: What the City Can Do

The City of Tulsa is actively committed to the following floodplain management activities:

- Preventative activities to keep flood problems from getting worse.
- Natural resource protection activities to preserve or restore natural areas or the natural functions of floodplain and watershed areas.
- Emergency services measures taken during an emergency to minimize its impact.
- Structural projects to keep flood waters away from properties.
- Public information activities to advise property owners, potential property owners, and visitors about flood hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of local floodplains.

As funding becomes available for this Repetitive Loss Area, the City will undertake a more detailed Mini-Master Drainage Plan to identify alternative solutions to the flooding problems and recommend a public works project. The actual construction of any public works project may require the acquisition of properties and/or drainage easements. The City will continue to fulfill its maintenance responsibility for channels, drainageways, and storm sewer inlets and pipes. At this time, the City has identified the following actions which are appropriate for RLA #26.

- Extend and/or improve the storm sewer system to better collect storm water runoff.
- Improve downstream hydraulic structures (bridges, culverts, etc.) to reduce backwater in the RLA..
- Improve roadside ditches and drainage structures to improve drainage.
- Construct upstream detention to reduce storm water runoff into the RLA.

VI. Funding

Due to the nature of the flooding problems and the localized, minor damages involved in RLA #26, the funding of needed site improvements will have to be borne by the individual property owner. The City will investigate the availability of funding for the public works actions listed above. Funding for ongoing City maintenance responsibilities is provided by the Stormwater Utility Fee. Funding for a public works project in this RLA is dependent of several factors, including the prioritized ranking of the project with other Capital Improvement projects, inclusion in future street maintenance projects, being part of a Bond Issue project, etc. The City will also investigate the possibility of increasing the storm sewer capacity with any future street projects in the area. Another potential funding source is FEMA's Hazard Mitigation Grant Program (HMGP), which can be implemented after a Presidential Major Disaster Declaration in the State.

VII. Conclusions and Recommendations

RLA #26 is situated in the gentle, shallow swales of the old stream beds of the East and West Branches of Joe Creek. Development and the construction of the Skelly Bypass covered over much of the original drainage of in the area and installed parallel storm sewers to carry runoff. The storm sewers proved to be incapable of handling storms like the one of May 27, 1984, which resulted in overland flow along streets and across yards and parking lots. During this storm, the box culverts under Skelly Dr. acted as a restriction and backed up floodwaters to the north across E. 49th St. and east across

Harvard Ave. Subsequent improvements to the Joe Creek channel below 51st St., the installation of larger storm sewers, and the replacement of the box culverts under Skelly Dr. and I-44 have largely solved the historic flooding problems at this location. However, rainfall events similar to that of 1984 are still expected to cause flooding along the East and West Branches of Joe Creek, and possibly in RLA #26. The first finished floor elevations of the three properties in the RLA are essentially at the same elevation as the 100-year flood at this location.

Property owners are encouraged to maintain flood insurance. The City of Tulsa is a Community Rating System (CRS) Class II Community, and all homeowners qualify for up to a 40% discount on their flood insurance premiums. Homeowners are also encouraged to undertake individual mitigation measures to reduce their risk of overland flooding. The City of Tulsa is ready to assist in this effort with professional advice.