Repetitive Loss Area # 44

Mill Creek

E. 11th St. & S. Maplewood Ave. Area

August 17, 2017

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Planning Consultants

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Engineering Services

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ENGINEERING SERVICES

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 a 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

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Acknowledgements

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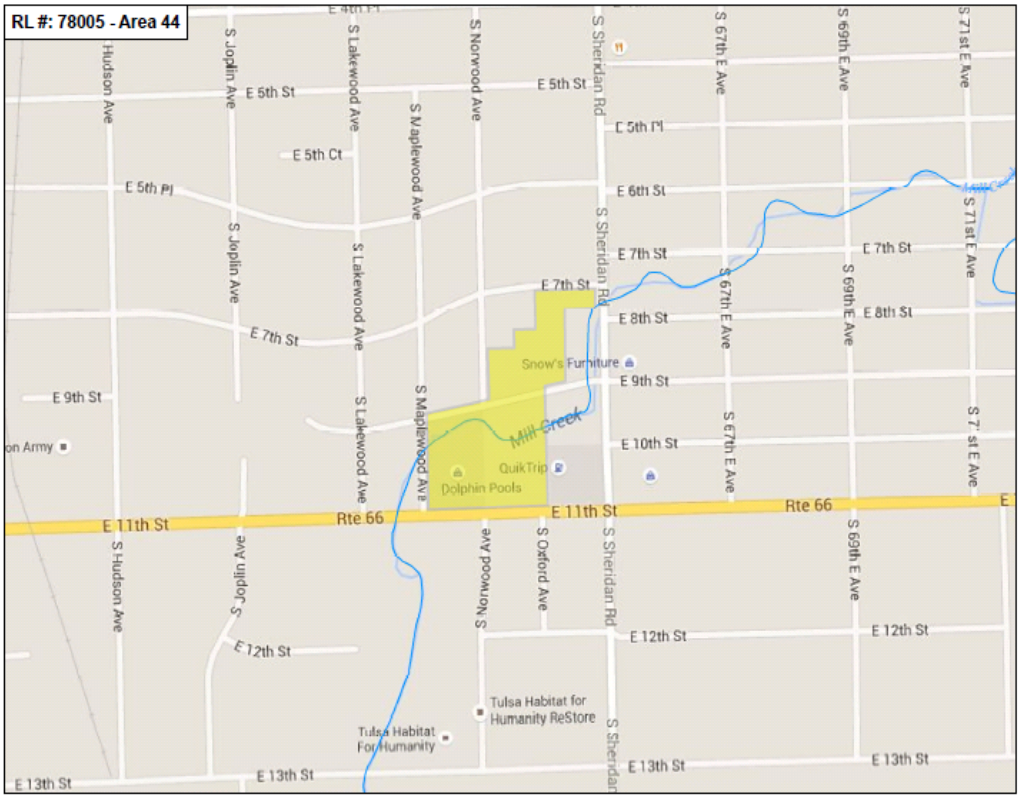
Repetitive Loss Area # 44

Mill Creek
E. 13th St. & S. Norwood Ave. Area

Overview

Repetitive Loss Area #44 is comprised of 20 structures on nine property lots in the Mill Creek drainage. The RLA is between S. Maplewood Ave. on the west and S. Sheridan Rd. on the east, and from E. 7th St. on the north to E. 11th St. on the south. The properties are situated in the floodway of Mill Creek and are within the City of Tulsa's 100-year floodplain, in an area of shallow flooding from undersized storm sewers and overland flow. There have been 20 paid claims for flood damage to 10 structures between 1984 and 2007 for a total of $216,165. Eight of the claims were for damage to the repetitive loss property. There have been no flood claims since 2007.



RLA #44 is located along Mill Creek between E. 11th St. and S. Maplewood Ave. and from E. 7th St. to Sheridan Rd..

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, Joe and Fred 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 per 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 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 are subject to the same general flooding conditions. This group of nearby properties is then designated an "RLA." The City is required to contact the owners of the properties in the RLA, 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 has been done for the individual repetitive loss properties.

It is important to note that most of the structures 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. In addition, the flooding events in question may have had

little to do with overbank flooding from a creek, but perhaps been the result of storm sewer backup or overland flow. The location of RLA #44 is shown on the aerial photo/topography map on page 4, below. The map identifies residential properties, County Assessor parcels, floodplains and the existing storm drainage system.

II. Location.

Mill Creek is a 3.8-mile-long, left-bank tributary to Mingo Creek that drains 2.76 square miles of east Tulsa. The creek rises in the high ground around the Tulsa State Fairgrounds, near E. 21st St. and Yale Ave., and flows generally east-northeast through fully developed residential, commercial and industrial neighborhoods to join Mingo Creek at about E. 9th St. and S. 95th E. Ave.

RLA #44. Mill Creek is carried in storm sewers from E. 11th St. northeast to E. 7th St. and Sheridan Rd.

Repetitive Loss Area #44 is located in the former floodway of Mill Creek, which was routed through storm sewers when Glenhaven addition was developed. The RLA is comprised of 20 buildings on nine property lots: three commercial properties, two multi-family complexes and four single-family residences. The structures are situated at an elevation of between 682 and 700 ft., while Mill Creek's 100-year floodplain in this reach is from 694 feet at the 11th St. bridge to 684 feet at Sheridan Rd.

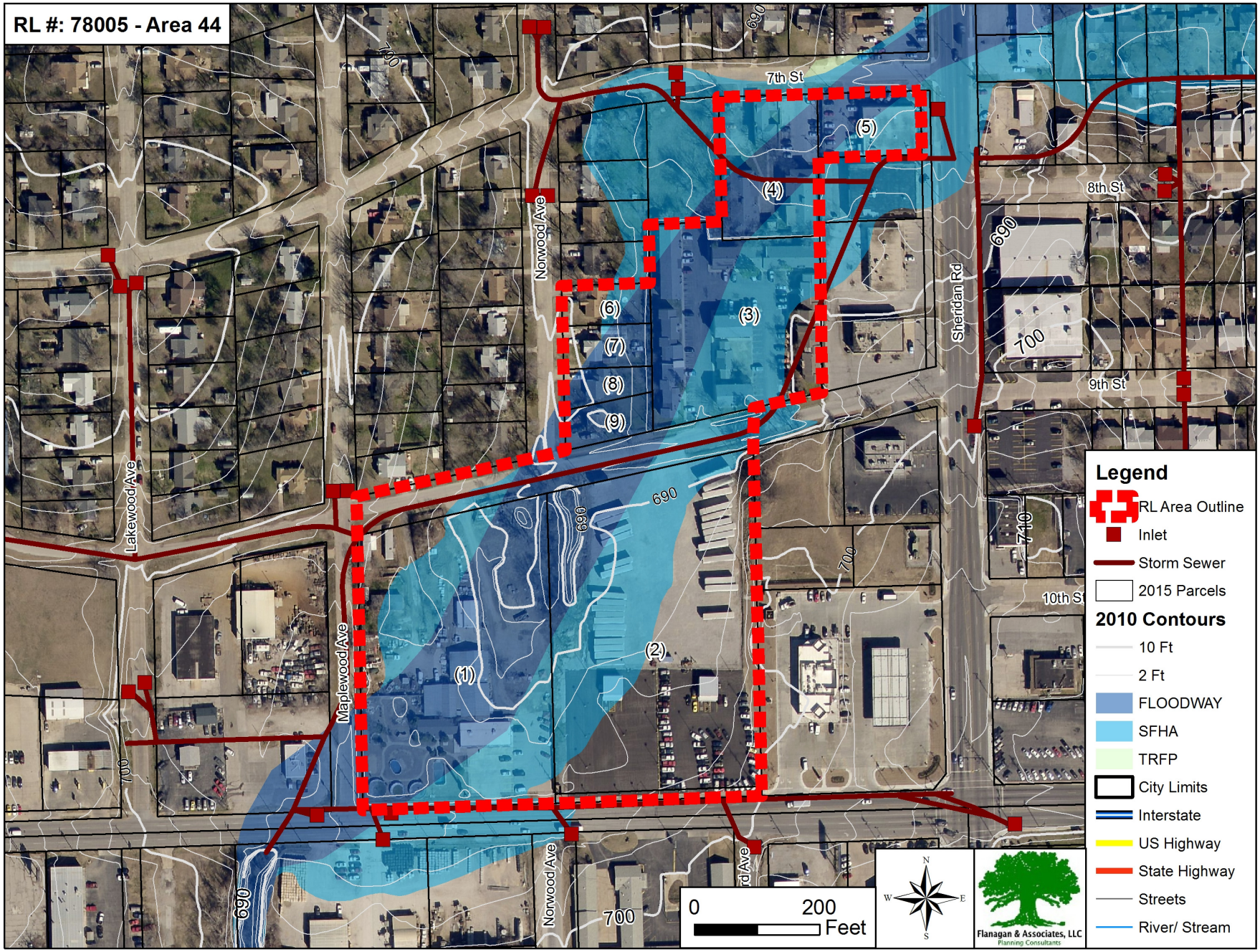
III. History

Development

As stated above, the properties in RLA #44 were developed in 1947 and 2011 along the former course of Mill Creek, the land filled and the stream routed through storm sewers. The land on which the buildings were constructed slopes gently to the northeast along the drainage swale that follows, generally, the former stream bed.

Flooding

Flooding has been due to overland flow, street flooding and storm sewer backup along the swale that generally follows the course of the original streambed. Mill Creek, which flows in an open channel between E. 15th St. and E. 11th St., is carried in a storm sewer from 11th St. north to S. Sheridan Rd. The storm sewer is undersized in this reach, with a


RL #: 78005 - Area 44
7th St
8th St
9th St
10th St
Norwood Ave
Sheridan Rd
Lakewood Ave
Maplewood Ave
(1)
(2)
(3)
(4)
(5)
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690
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Flanagan & Associates, LLC
Planning Consultants
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2015 Parcels
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2 Ft
FLOODWAY
SFHA
TRFP
City Limits
Interstate
US Highway
State Highway
Streets
River/ Stream

capacity of approximately 1,700 cfs, resulting in an overland flow rate of about 1,540 cfs north of 11th St. Parts of the system are surcharged and operate under pressure during periods of high flow. Residents report manhole covers being lifted off and reverse flow from curb inlets at some locations. The repetitive loss property in RLA #44 made eight paid flood damage claims in 1994 and 1995 alone. Residents of the apartment complexes in the northern part of RLA #44 reported 28 inches of water in their properties in the flood of June 1974 and similar conditions in the flood of May 1976, and notified the City during the September 2007 flood event that they had 3 feet of water in their buildings, and that poor drainage and ponding have been ongoing issues in the neighborhood. The flood events that resulted in paid damage claims in RLA #44 occurred on May 29, 1984; November 13, 1985; October 2, 1986; July 14, 1994; June 23, 1995; and September 8, 2007. There has been no flooding reported in the RLA since the 2007.

Improvements

Mingo Creek project in the 1980s created the Pipeyard detention area on the south side of E. 13th St., upstream of the RLA. In the 1990s storm sewers were enlarged through the upper Mill Creek drainage to Sheridan Rd.

IV. Research and Analysis

The analysis of Repetitive Loss Area #44 was conducted by the Project Team through interviews with City officials, research into Engineering Services and Stormwater Drainage files, including the *Upper Mill, Audubon and Jones Creeks Basin Drainage Study* and the *Mingo Creek Master Drainage Plan*, *Tributaries LB7, RB6 and RB7,* 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 the property owners and occupants soliciting information about prior and existing flooding issues, if any.

Looking south on Mill Creek from E. 11th St. On the south side of 11th St. Mill Creek flows in an open channel. North of 11th St. the stream is carried in storm sewers to McClure Park.

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.

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, April 2013
- *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
- *Mingo Creek Master Drainage Plan, Tributaries LB7, RB6 and RB7*, Mansur, Daubert, Williams, August 1980
- *Upper Mill, Audubon and Jones Creeks Basin Drainage Study*, FHC Inc., May 1993
- "The Effects of Urbanization on the Mingo Creek Watershed," Tim Mars, 1984.
- *Guidebook to Conducting Repetitive Loss Area Analyses*, UNO and FEMA

Flood Insurance Data

Eleven properties in the RLA currently carry flood insurance. Because the Privacy Act of 1974 (5 USC 522a) restricts the release of flood insurance policy and claims information

to the public, neither the repetitive loss property nor address-specific claims data are detailed in this Plan.

Claims Data:

Six properties in RLA #44 made 20 paid claims for damage to 10 structures between 1984 and 2007 for a total of $216,165. There were five claims on May 27, 1984 for $127,181; four claims on October 1, 1986 for $6,526; six claims on July 14, 1994 for $73,263; three claims on June 23, 1995 for $5,473; and two claims on September 8, 2007 for $3,722. The claims ranged from a low of $80 to a high of $35,000, and averaged about $16,500.

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 flooding problem areas. The results of the research and analysis are described in the following paragraphs and summarized in the table below.

Structure Type:

The structures in RLA #44 are six commercial buildings, ten multi-family structures, and four single-family residences.

Foundation Type:

The type of foundation was determined by field investigation and query of Tulsa County Assessor records. The commercial and multi-family buildings are slab-on-grade and the residential units are built on crawl spaces.

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. The structures are considered to be in Average to Very Good condition. These findings are summarized in the following table.

Properties in the RLA

Address	Structure Type	Foundation	Year Built	Condition
Property 1	Commercial	Slab	1958	Average
Property 2	Multiple Unit	Slab	1968	Average
Property 3	Single-Family	Crawl Space	1947	Average
Property 4	Multiple Unit	Slab	1968	Average
Property 5	Single-Family	Crawl Space	1947	Average
Property 6	Single-Family	Crawl Space	1947	Very Good
Property 7	Single-Family	Crawl Space	1947	Good
Property 8	Commercial	Slab	1965	Average

Address	Structure Type	Foundation	Year Built	Condition
Property 9	Commercial	Slab	2011	Average

Notification

Annual Floodplain Notification: Each year, in March, the City of Tulsa notifies all property owners and occupants within a 100-year floodplain that their properties are subject to flooding and informs them of what steps they can take to protect their buildings, contents and employees, including the purchase of flood insurance.

Annual Repetitive Loss Area Notification: Property owners and occupants in Repetitive Loss Area #44 are notified annually that their properties are located in a Repetitive Loss Area, and are potentially subject to flood damage from storm drainage backup and overland flow.

Property Owners/Residents Notification: Property owners and 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. Residents of the apartment units have notified the City on several occasions that the properties are prone to flooding and have experienced damage from the 1974 and 1976 floods up to 2007. One homeowners in the RLA stated that runoff is coming from the neighboring apartment complex and flooding their garden and garage. There is no drainage to handle this runoff.

Conclusions

Flooding issues in RLA #44 have been due to undersized storm sewers in the reach between E. 11th St. and S. Sheridan Ave., which was originally designed to carry about half of the flow of the 100-year storm. The properties are all within the floodway and the 100-year floodplain for this reach of Mill Creek.

V. Mitigation Measures

Individual Mitigation 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.

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.

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

Create Berms, Swales or Redirected Drainage. Flood waters can be diverted away from your 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. This may be the most feasible solution for areas with flooding due to overland flow, as in RLA #44.

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. If a property is located in a FEMA Floodway or Special Flood Hazard Area, as are those of RLA #44, demolition, acquisition and relocation may be the most feasible and cost-effective option.

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. Some of the structure in RLA #44 could be candidates for elevation.

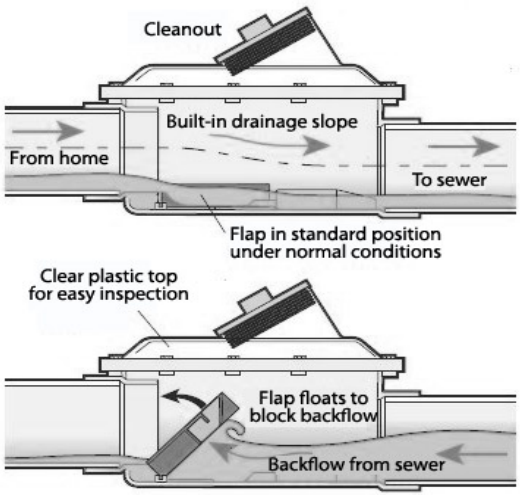
Dry Floodproof Your Structure. This can include actions that seal a structure and prevent floodwaters from entering. This method is best in areas where flood depths are no more than two or three feet. Buildings can be made watertight by sealing the walls with waterproof coatings, impermeable membranes, 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 sanitary sewer lines and drains. Dry flood-proofing could well be an option for the properties in RLA #44, but should be designed by an engineer to ensure 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 or Storage Areas. The garage or storage area, with their slab-on-grade construction, are vulnerable 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.

Correct Sanitary Sewer Backup Problems. Sanitary sewer backup can be a cause of property damage in low-lying, flood-prone areas like RLA #44. The installation of backflow prevention valves on your sanitary sewer lines is highly recommended.



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

Maintain Nearby Streams, Ditches, and Storm Drains. Local flooding can often be caused by brush and other debris blocking drainage ways and culverts. Bar ditches and culverts must be kept clear of debris. Residents and property owners should do their part in maintaining these drainage structures. Do not attempt to clear debris during a flood event.

Purchase and Maintain Flood Insurance. Flood Insurance is available and recommended for the structure and contents 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, you are entitled to a discount on your flood insurance. A property does not have to be in a floodplain to qualify for flood insurance.

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 may be appropriate for RLA #44.

- Create berms and swales to direct stormwater runoff away from structures.
- Create overland flow path to allow better drainage of ponded water.
- Acquire flood prone properties on a voluntary basis.

VI. Funding

Due to the nature of the flooding problems and the localized damages involved in RLA #44, the funding of needed site drainage improvements will have to be borne by the individual property owner.

VII. Conclusions

Repetitive Loss Area #44 is comprised of 20 buildings on nine property lots, and includes three commercial properties, two multi-family complexes and four single-family residences. The structures are in the floodway of Mill Creek and situated at an elevation of between 682 and 700 ft. Mill Creek's 100-year floodplain in this reach is at 694 feet elevation at the 11th St. bridge and 684 feet at Sheridan Rd. Upstream detention facilities

constructed by the City and US Army Corps of Engineers were not designed with the storage capacity to protect the buildings in RLA #44 during the 100-year flood. Due to the undersized storm sewers in this reach of the Mill Creek basin, the properties will continue to experience shallow, overland flow flooding during the 100-year and higher storms. Individual site drainage measures, storm sewer improvements and acquisition are the preferred options for reducing flooding in the RLA.

VIII. Recommendations

- Property owners and occupants are encouraged to obtain and keep a flood insurance policy on their structures and contents. If eligible, a Preferred Risk Policy should be obtained.
- The City of Tulsa Engineering Services Department staff is available to advise property owners and occupants about drainage improvements that can protect facilities from overland flow flooding, storm sewer backup, erosion and other local drainage problems.