



CITY OF
Tulsa
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Repetitive Loss Area # 5

**Jones Creek
E. 12th St. & S. Memorial Blvd. Area**



August 17, 2017



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Bill Robison, P.E., CFM
Engineering Services



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

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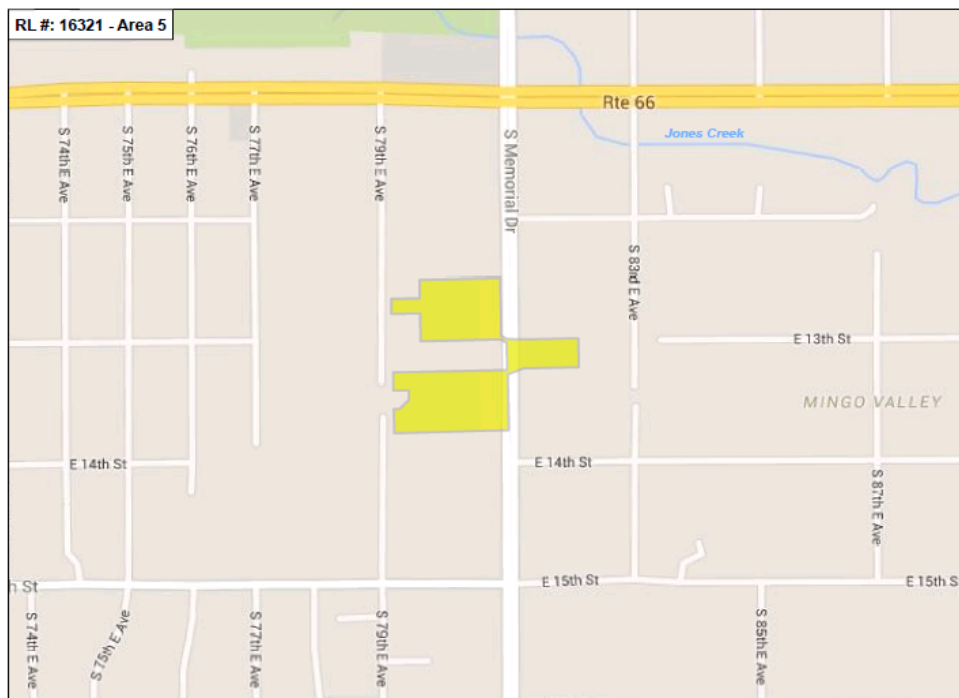
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Repetitive Loss Area # 5

Jones Creek E. 12th St. & S. Memorial Blvd. Area

Overview

Repetitive Loss Area (RLA) #5 is comprised of three property lots in the Jones Creek drainage containing 18 structures: one multi-family apartment complex with 14 structures, one residential property with three single family homes, and one commercial building. The RLA reaches from about E. 14th St. and S. 79th E. Ave. in the west to about E. 13th St. and S. 83rd E. Ave. in the east. Jones Creek mainstem winds through the area from west to east in an open channel. According to both FEMA's and the City of Tulsa's flood hazard maps, 14 of the 18 structures are within or touched by the creek's 100-year SFHA, either by the floodway or by areas of shallow flooding. All 18 structures are within the 500-year floodplain of Jones Creek. Flood damage has been largely due to inadequate storm sewer capacity, overland flow and backup flooding behind undersized conduits at Memorial Blvd. and S. 83rd E. Ave. There is one repetitive loss property in the RLA which made claims in 1979 and 1984 for a total of \$38,291. Altogether, eight of the 18 structures have made 11 claims, nine of which were paid, for a total of \$207,121. There have been no flood claims in the RLA since 1986.



RLA #5 is located in the Jones Creek drainage in the area of E. 12th St. and S. Memorial

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 may be 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 may have been the result of storm sewer backup or overland flow. The location of RLA #5 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

Jones Creek is a 4-mile-long, left-bank tributary to Mingo Creek that drains about 2 square miles of east Tulsa. The creek rises in the high ground near E. 21st St. and Sheridan Rd., and flows generally east-northeast through residential, commercial and industrial neighborhoods to join Mill Creek at about E. 12th St. and 87th E. Ave. En route, the mainstem is joined by a northern, left bank tributary (Mingo LB7-2 L) just west of Memorial Blvd. and by a right bank tributary (Mingo LB7-2R) at about E. 13th St. and S. 85th E. Ave.

The three properties that make up RLA #5 are along the open channel of Jones Creek mainstem (Mingo Creek Tributary LB7-2) on the west and east sides of Memorial Blvd. Mingo Creek Tributary LB7-2L is carried in storm sewers beneath the apartment complex and joins the mainstem just west of Memorial. The tributary LB7-2R does not have a direct impact on flooding within RLA #5.



Jones Creek at about E. 14th St. and S. 79th E. Ave., looking northeast. Mill Creek mainstem flows in an open channel throughout RLA #5.

The structures in RLA #5 are situated at an elevation of between 640 and 650

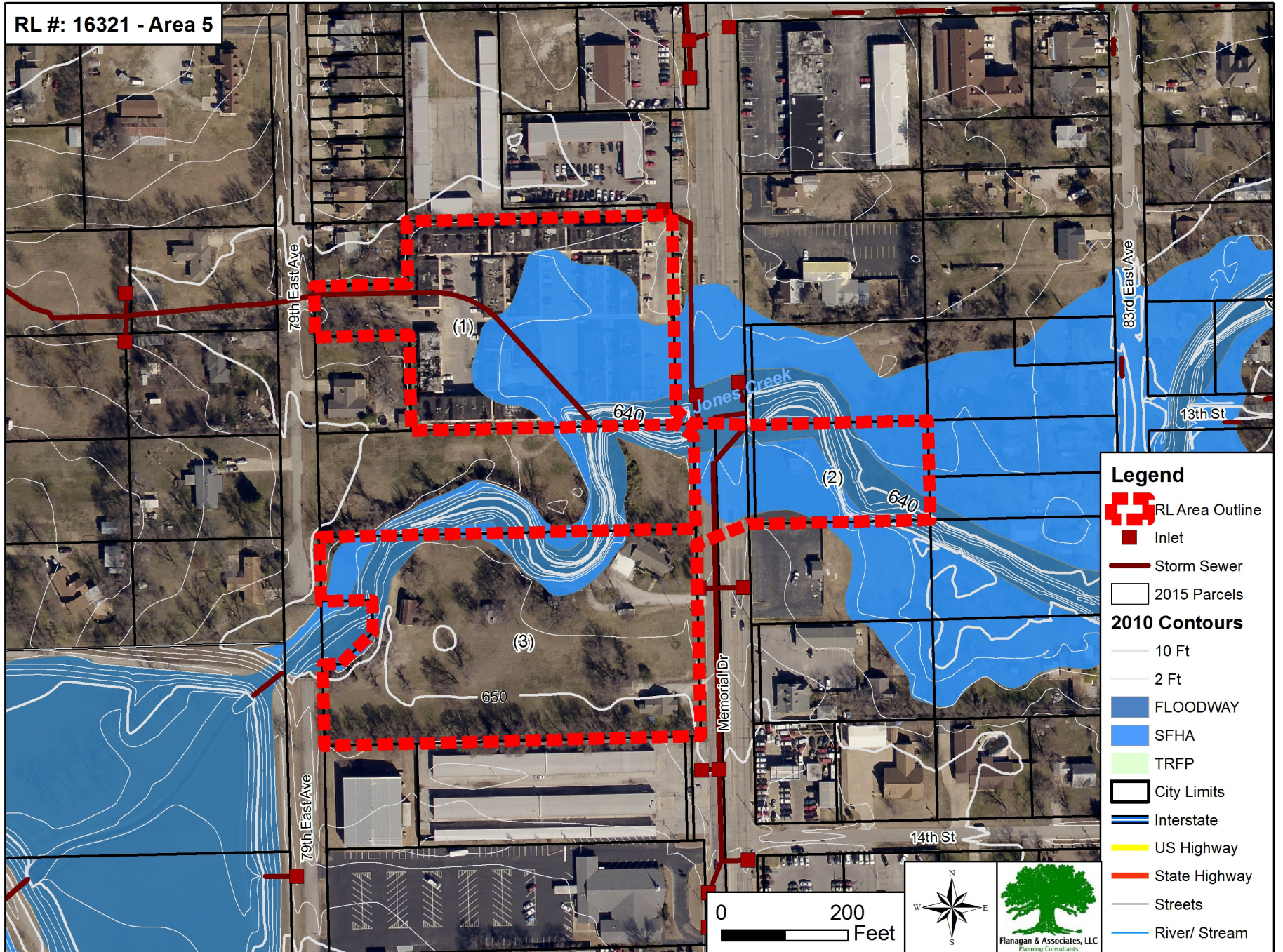
feet, while Jones Creek's 100-year floodplain in this reach varies from 648 feet at S. 79th E. Ave. and 645 ft. at Memorial Blvd., to 642 feet at S. 83rd E. Ave. Flood damage has been largely due to inadequate storm sewer capacity, overland flow and backup flooding behind undersized conduits at Memorial Blvd. and S. 83rd E. Ave.

III. History

Development

The properties in RLA #5 were developed in the Holiday Manor and Forest Acres subdivisions and on unplatted land between 1938 and 1997—with the commercial and residential structures being built in 1938 and 1940, respectively, and the apartment complex between 1970 and 1997. The terrain on which the buildings are located is in the 100-year floodway and floodplain of Jones Creek. The creek's 100-year floodplain touches 14 of the RLA's 18 structures, as shown on the detailed topographical map on page 4, below.

RL #: 16321 - Area 5



Flooding

The *Mingo Creek Tributaries Master Drainage Plan for LB7, RB6, RB7*, written in 1980, mentions severe flooding in the basin in June 1974 and May 1976. The basin experienced subsequent flooding in May 1984, November 1985, October 1986, July 1994, June 1995, April and May 2004, and September 2007. The Master Drainage Plan attributed flooding prior to 1980 to undersized storm sewers, overland flow, and backup flooding behind Memorial Blvd. and S. 83rd E. Ave.

Although there is no loss data for the floods of 1974 and 1976 for the properties in RLA#5, total damage for subsequent events was \$207,121. Within RLA #5, claims were made for the repetitive loss property on July 6, 1979 and May 27, 1984 for a total of \$38,291. Altogether, nine paid claims have been made for flood damage to eight structures on three occasions: July 6-7, 1979 (\$4,425), May 27-29, 1984 (\$199,369) and September 29, 1986 (\$3,327). Two additional claims on June 22, 1985 were not approved. There have been no flood damage claims in the RLA since 1986.

Improvements

The Master Drainage Plan for the basin identified the most cost-effective structural solutions (channel improvements, enlarged conduits, and stormwater detention) for the area—specifically, a major stormwater detention facility at E. 14th St. and S. 79th E. Ave., an enlarged conduit beneath Memorial Blvd., and the removal of the Jones Creek crossings at S. 79th E. Ave. and S. 83 E. Ave.



Jones Creek stormwater detention facility, looking upstream from E. 14th St. and S. 79th E. Ave.

The Upper Mill Creek Master Drainage Plan recommends Project MLM2J, a concrete-lined channel from E. 15th Street to the Jones Creek detention facility. In addition, one multi-family structure was removed from the apartment complex, and one home from the single-family residence property.

IV. Research and Analysis

The analysis of Repetitive Loss Area #5 was conducted by the Project Team through interviews with City officials, research into Engineering Services and Stormwater Drainage files, including 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.

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:

- FEMA Flood Map 40143C0358L
- *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

- *Mingo Creek Master Drainage Plan, Tributaries LB7, RB6 and RB7*, Mansur, Daubert, Williams, August 1980
- “The Effects of Urbanization on the Mingo Creek Watershed,” Tim Mars, 1984.
- *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 # 5.

Flood Insurance Data

One property in RLA #5 currently carries flood insurance on one structure. 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 properties nor address-specific claims data are detailed in this Plan.

Claims Data.

All three properties of RLA #5 have made claims for flood damage. The apartment complex has made six paid claims for four structures for a total of \$197,405 (95% of all claims for the RLA); the residential property has made two claims for two structures for \$9,441; and the commercial building has made one claim for \$275. Only one of the 21 structures in the RLA (a building in the apartment complex) is a repetitive loss property—flooded in July 1979 and May 1984. In terms of damage, the worst flood event, by far, was that of May 27-29, 1984, which resulted in six paid claims for \$199,369, or 96% of the total.

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.

Structures

The Project Team made a number of visits to RLA #5 to determine the situation and condition of the structures. Visual analysis was verified by queries of Tulsa County Assessor data.

Structure Type.

The structures in RLA #5 are comprised of one apartment complex, three single-family residences on one property lot, and one commercial property.

Foundation Type.

The type of foundation was determined by field investigation and query of Tulsa County Assessor records. The commercial buildings and apartment units are slab-on-grade, and the three residences 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 were considered to be in Fair to Average condition. These findings are summarized in the following table.

Properties in the RLA

Address	Structure Type	Year Built	Foundation Type	Building Condition	Flood plain
Property 1	Commercial	1938	Slab	Average	Jones Creek
Property 2	SF Residential	1940, 1950	Crawl Space	Average	Jones Creek
Property 3	Apartments	1970-1997	Slab	Fair	Jones Creek

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 #5 are notified annually that their structures are located in a Repetitive Loss Area, and are potentially subject to flood damage from storm sewer backup, street flooding 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. There have been two comments concerning flooding from property owners in response to notification. One resident of the apartment complex stated that there was erosion in Jones Creek adjacent to a 72-inch SEP. The owner of the commercial property reported that trees had fallen into the creek and were blocking flow.

Conclusions

Flooding issues in RLA #5 have been due to inadequate storm sewer capacity, overland flow resulting from the undersized sewer system beneath the apartment complex, and backup flooding behind the undersized culverts at Memorial Blvd. and S. 83rd E. Ave.

V. Mitigation Measures

Overview

The construction of the Jones Creek detention facility at E. 14th St. and S. 79th E. Ave., the enlargement of the conduit under Memorial Blvd., and the removal of the conduits and roadways at S. 79th E. Ave. and S. 83rd E. Ave. have done much to reduce flooding on this reach of Jones Creek—but have not removed the RLA from FEMA’s or the City’s 100-year regulatory floodplains or FEMA’s 500-year floodplain. Because of the undersized sewer system beneath the apartment complex and the flat topography of the Jones Creek floodplain in this reach, the properties in the RLA remain at some risk of shallow flooding from 100-year magnitude or greater storms, like those of 1974 and 1984.

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, 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 property owners in flood hazard areas know and understand their flood risk and take what steps they can to protect their buildings, furnishings and equipment. 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 people in flood hazard zones to have 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 your residence 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 #5.

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 #5. However, 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 structures built on concrete slabs. It can sometimes be cost-effective for wood frame buildings on crawlspaces. The single-family residences in RLA #5 could possibly 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 floodproofing needs to be designed by an engineer to ensure the structure can resist the force of the water.

Wet Floodproof Your Building. Wet floodproofing 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.

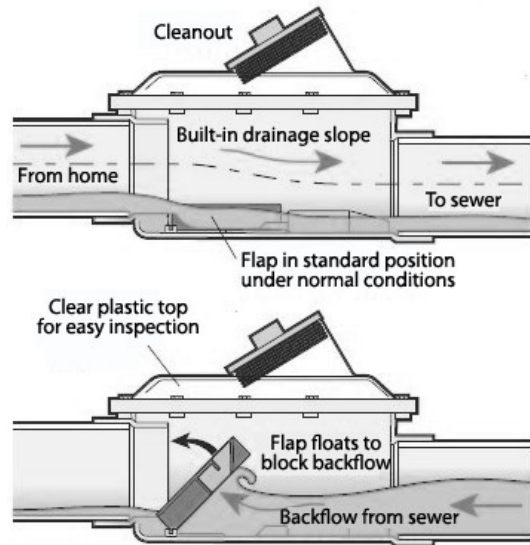
Elevate Damage-Prone Components. Critical items such as furnace or air conditioning units, should be elevated to avoid flood damage. This should be done for components that are in the wet-floodproofed area of the building as well as for units that are outside of the structure but subject to shallow flooding.

Maintain Nearby Streams, Ditches, and Storm Drains. Local flooding can often be caused by brush and other debris blocking drainage ways and culverts, bar ditches and storm sewer inlets and 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 #5. 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 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.



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 #5.

- Extend and/or improve the storm sewer system to better collect storm water runoff.
- Create berms or swales to direct runoff away from residential properties.
- Acquire flood prone properties on a voluntary basis.
- Improve conveyance of Creek to mitigate overbank flooding.
- Improve downstream hydraulic structures (bridges, culverts, etc.) to reduce backwater in the RLA.

VI. Funding

Due to the nature of the flooding problems and the localized damages involved in RLA #5, the funding of needed improvements will have to be borne by the individual property owner.

VII. Conclusions and Recommendations

Repetitive Loss Area #5 is comprised of 18 buildings on three property lots in the Jones Creek drainage, between S. 79th E. Ave. and S. 83rd E. Ave. The RLA contains one multifamily apartment complex with 14 structures, three single-family residences, and one commercial building. Fourteen of the 18 structures are within the Jones Creek 100-year floodplain, either in the floodway or areas of shallow flooding. All but one of the structures are within FEMA's 500-year floodplain for this reach of Jones Creek. Because the sewer system beneath the apartment complex is undersized, runoff during peak rainstorms flows overland along the swale of the former channel of LB 7-2 L.1 from S. 79th E. Ave. to Memorial Dr. Historically, undersized conduits beneath Memorial Dr. and S. 83rd E. Ave. caused backup flooding along the creek. These bottlenecks have been removed. The conduit under Memorial has been enlarged and the one under S. 83rd E. Ave. has been demolished, along with the roadway. Three structures, two multi-family building and one single-family residence, have been removed. Most importantly, the Jones Creek stormwater detention facility was constructed south and west of E. 14th St. and S. 79th E. Ave., significantly reducing peak flows through RLA #5. Altogether, between 1979 and 1986, nine claims totaling \$207,121 were paid for damage to eight structures on the RLA. There have been no flood damage claims from the RLA since 1986.