

# Repetitive Loss Area # 32

**Bell Creek  
E. 46<sup>th</sup> St. & S. Memorial Dr. Area**



August 17, 2017





## 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, working together to develop a plan to reduce or eliminate flooding in their 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](http://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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# Repetitive Loss Area # 32

## Bell Creek E. 46<sup>th</sup> St. & S. Memorial Dr. Area

### Overview

Repetitive Loss Area #32 is comprised of four commercial buildings on three lots at the southwest corner of E. 46<sup>th</sup> Pl. and S. Memorial Dr. The properties were developed between 1970 and 1982 and are all one-story commercial buildings. The properties are situated in the Bell Creek drainage, along what was once the course of Bell Creek's Mingo Tributary 11A. One property in the RLI made two flood damage claims in 1982 and 1984 for a total of \$13,271. The cause of flooding was overland flow and site drainage issues in the generally level terrain of the immediate neighborhood. There have been no claims or reported flooding in the RLA since 1984.

Flooding issues are related to runoff from the high ground to the south southwest—generally from the area E. 51<sup>st</sup> St. and S. Memorial Dr. downhill into the expanse of parking lots immediately south of the properties of the RLA. The hills around E. 51<sup>st</sup> St. and S. Memorial rise to about 750 ft., while the properties of the RLA are at an elevation of between 700 and 710 ft.

### I. Background

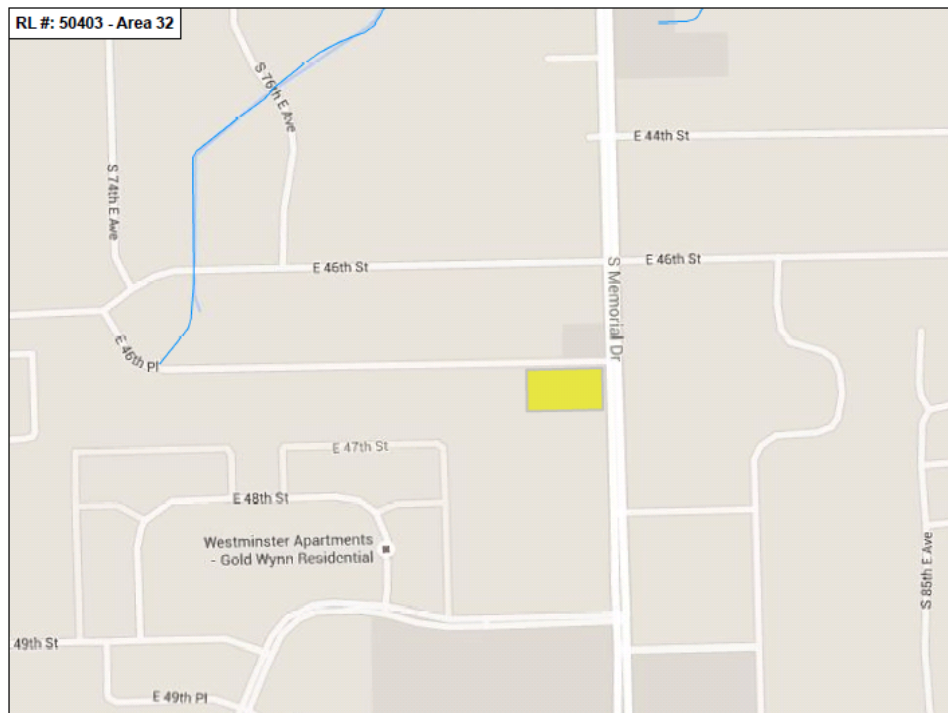
During the post-World War building boom of the 1950s and 1960s, Tulsa expanded rapidly east and south into the basins of Mingo, Joe and Fred creeks. Because of the city's climate and the broad floodplains along these creeks, this growth brought with it an increased risk of flooding. And indeed, by the 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.



**RLA #32 is located on the southwest corner of E. 46<sup>th</sup> St. and S. Memorial Drive, in the upper reach of Bell Creek (Mingo Creek Tributary 11A)**

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 been the result of storm sewer backup or overland flow. The location of RLA #32 is shown on the aerial photo/topography map on page 4, below. The map identifies commercial properties, County Assessor parcels, floodplains and the existing storm drainage system.

## **II. Location**

Bell Creek is a 2.5-mile-long, left-bank tributary to Mingo Creek that drains 2.5-square-miles of southeast Tulsa. The basin is fully developed with a combination of residential, commercial and industrial properties. The creek has two primary branches (Mingo Tributaries 11A and 11B) that rise in the south Tulsa hills near E. 51<sup>st</sup> and S. 76<sup>th</sup> E. Ave. and E. 55<sup>th</sup> and S. Memorial Blvd., respectively. The two branches flow generally north north-east to join at E. 39<sup>th</sup> St. and S. 93<sup>rd</sup> E. Ave. before continuing north to junctions with Fulton Creek near 33<sup>rd</sup> Pl. and S. 93<sup>rd</sup> E. Ave. and Mingo Creek at about E. 32<sup>nd</sup> Pl. and S. 93<sup>rd</sup> E. Ave.

Repetitive Loss Area #32 is comprised of four commercial buildings on three property lots located on the south side of E. 46<sup>th</sup> Pl. and the west side of Memorial Dr. The properties are situated in a former drainage channel of Bell Creek's Mingo Tributary 11A. The terrain in the RLA's immediate area is generally paved and flat, but slopes downward to the north, following the swale of the former stream bed.

## **III. History**

### ***Development***

As stated above, the properties in RLA #32 were developed between 1970 and 1982 along the south side of E. 46<sup>th</sup> Pl. The land on which the buildings were constructed appears to be generally flat, but rises to the south and southwest to high ground along S. 51<sup>st</sup> St. The properties surrounding the RLA along Memorial Blvd. are primarily commercial enterprises with asphalt parking lots that generate a considerable amount of runoff.

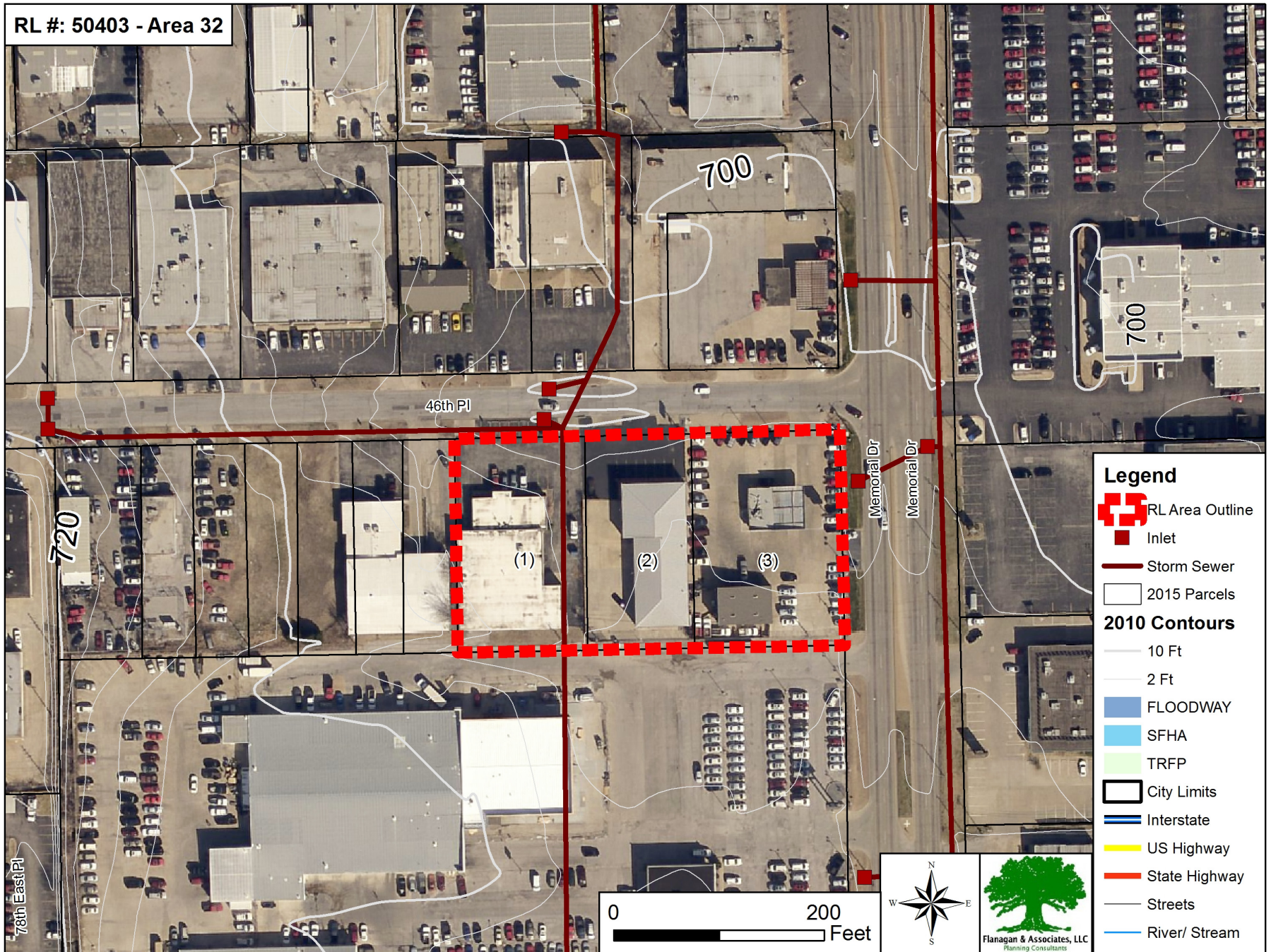
### ***Flooding***

The properties of RLA #32 suffered flood damage on two occasions, when rainfall reached or exceeded 5 inches in a 24-hour period: on May 18, 1982 and May 27, 1984. These flood events were the result of rainfall flowing off of the rising ground to the south and south southwest. The runoff overwhelmed the storm sewer system and the resulting overland flow followed the course of the former stream bed, which passes directly through RLA #32.

### ***Improvements***

After the flood events of 1982 and 1984, the City of Tulsa installed additional storm sewer inlets on E. 46<sup>th</sup> Pl. and along S. Memorial Ave. These measures appear to have solved the overland flow flooding for RLA #32 for 100-year rainfall events.

RL #: 50403 - Area 32

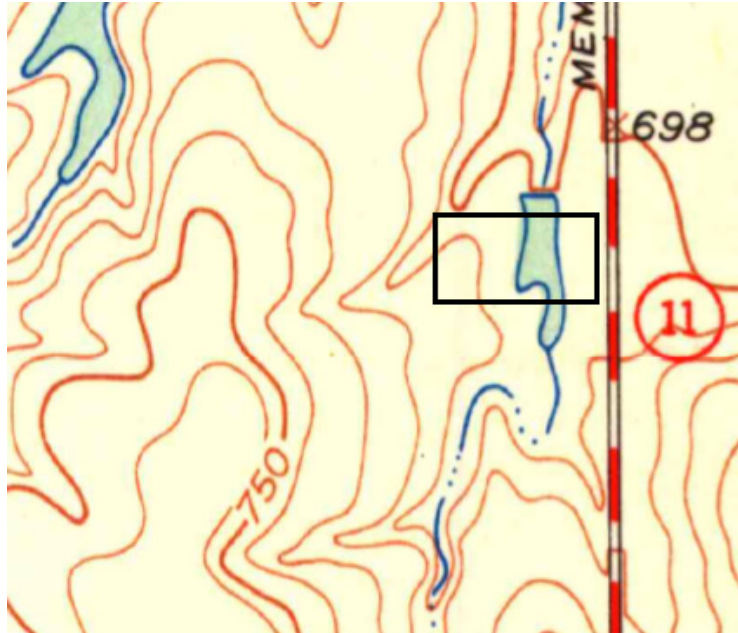


#### IV. Research and Analysis

The analysis of Repetitive Loss Area #32 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*, 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).



This early topographical map shows that RLA #32 is situated in the former channel of Bell Creek's Mingo Tributary 11A. Flooding has been due to storm sewer backup and the resulting overland flow following the swale of the former stream bed through the RLA.

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, 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 for Tributaries between I-44 and the Broken Arrow Expressway*, June 1981
- “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 flooding problems in Repetitive Loss Area #32.

### ***Flood Insurance Data***

None of the properties in the RLA currently carries 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.***

One property in the RLA has made two flood damage claims, one in 1982 and another in 1984, for a total of \$13,271. Individual claims were \$3,280 in 1982 and \$9,991 in 1984. The claims averaged about \$6,600. There have been no claims or reported flooding in this neighborhood since 1984.

### ***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 #32 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 #32 are all commercial buildings.

**Foundation Type.**

The type of foundation was determined by field investigation and query of Tulsa County Assessor records. All structures in RLA #32 slab-on-grade foundations.

**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 all considered to be in Average condition. These findings are summarized in the following table.

**Properties in the RLA**

Address	Structure Type	Year Built	Foundation Type	Building Condition
Property 1	Commercial	1973	Slab on Grade	Average
Property 2	Commercial	1975	Slab on Grade	Average
Property 3	Commercial	1970/1982	Slab on Grade	Average

**Notification**

**Annual Floodplain Notification.** Each year, in March, the City 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 and employees, including the purchase of flood insurance.

**Annual Repetitive Loss Area Notification.** Property owners and occupants in Repetitive Loss Area #32 are notified annually that their properties are located in a Repetitive Loss Area, and are potentially subject to flood damage from overbank flooding, storm sewer 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.** There have been no comments concerning flooding from owners/occupants in response to notification.

## ***Conclusions***

Flooding issues in RLA #32 are related to runoff from the high ground around E. 51<sup>st</sup> St. and S. Memorial Dr. downhill along the former stream bed of Bell Creek's Mingo Creek Tributary 11A into the parking lots immediately south of the RLA. The hill upon which the shopping center is located rises to about 750 ft., while the properties of the RLA are at elevations of between 700 and 710 ft. Storm sewer improvements in the immediate area by the City of Tulsa in the 1990s appear to have solved flooding issues in the RLA. However, greater than 100-year rainfall events, like the 300-year storm of 1984 will likely continue to pose a flooding threat to the structures.

## **V. Mitigation Measures**

### ***Overview***

The storm sewer improvements installed in the immediate vicinity of the RLA appear to have solved the overland flow problems in the neighborhood. Although there have been no flood claims since 1984, potential flooding from overland flow has not been severely tested since the 300-year storm of 1984. The issues that remain are related to site drainage problems that would likely be best addressed by berms or other methods to block overland flow from the properties immediately south of the RLA.

### ***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](http://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 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-



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



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 lists 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 occupants 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 #32.

**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 was 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](tel:9185967777).

Acquisition is usually not feasible or cost effective for areas of shallow flooding, as in RLA #32. 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. None of the structures in RLA #32 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 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 is only allowed on non-residential structures,

so may be appropriate for structures in RLA #32. 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, can be one of the most vulnerable areas of your property to overland flow flooding. Remove, relocate, elevate, or otherwise protect items that can be damaged from flooding

**Maintain Nearby Streams, Ditches, and Storm Drains.** Local flooding can often be caused by brush and other debris blocking drainage ways and culverts. Culvert blocking by limbs, grass cuttings and other debris could contribute to future flooding in RLA #32. Storm sewer inlets must be regularly inspected and kept free of blockage. Residents and property owners should do their part in keeping storm drains clear of brush and debris. Do not attempt to clear debris during a flood event.

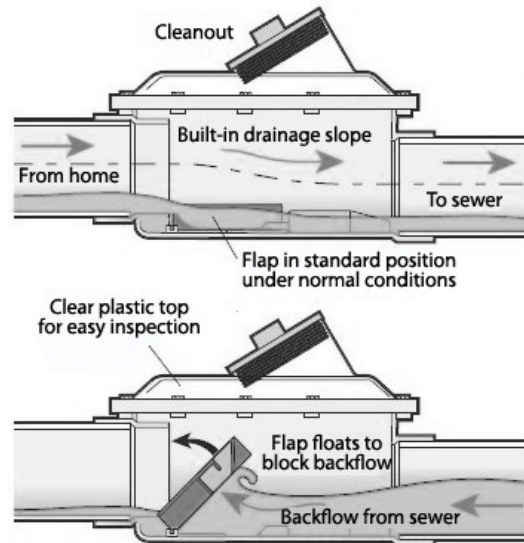
**Correct Sanitary Sewer Backup Problems.** Sanitary sewer backup can be a problem in low-lying, flood-prone areas like RLA #32. The installation of backflow prevention valves on your sanitary sewer lines is highly recommended.

**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.

***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.



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

- 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 #32.

- Extend and/or improve the storm sewer system to better collect storm water runoff.

## **VI. Funding**

Due to the nature of the flooding problems and the localized damages involved in RLA #32, the funding of needed improvements will have to be borne by the individual property owner. The City will investigate the possibility of increasing the storm sewer capacity with any future street projects in the area.

## **VII. Conclusions and Recommendations**

Repetitive Loss Area #32 contains four commercial buildings on three property lots in the 7600 block of E. 46<sup>th</sup> Pl. in the Bell Creek drainage. The RLA is situated in the former streambed of Bell Creek's Mingo Creek Tributary 11A. The slab-on-grade commercial properties were developed between 1970 and 1982 and the creek routed through storm sewers that followed the course of the former stream bed. The properties around Memorial Blvd. and E. 51<sup>st</sup> St. developed later, in the mid-1970s, and were largely commercial enterprises with expansive asphalt parking lots that generated considerable runoff. One property in RLA #32 suffered flood damage on two occasions, on May 18, 1982 and May 27, 1984. Flooding was caused by storm sewer backup and the resulting overland flow following the swale of the former stream bed. Storm sewer improvements by the City in the 1990s appear to have solved the overland flow problem for RLA #32 for events up to the 100-year flood. However, Master Drainage Plans for Southeast Tulsa caution residents and property owners that 300-year storms, like the one that devastated the city in 1984, will likely continue to cause damage in areas troubled by overland flow.

Homeowners 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 advice.