Repetitive Loss Area # 50

Lower Mingo Creek Mainstem
Wolf Creek Industrial Park
E. Pine St. & N. 105th E. 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

Contents

Acknowledgements

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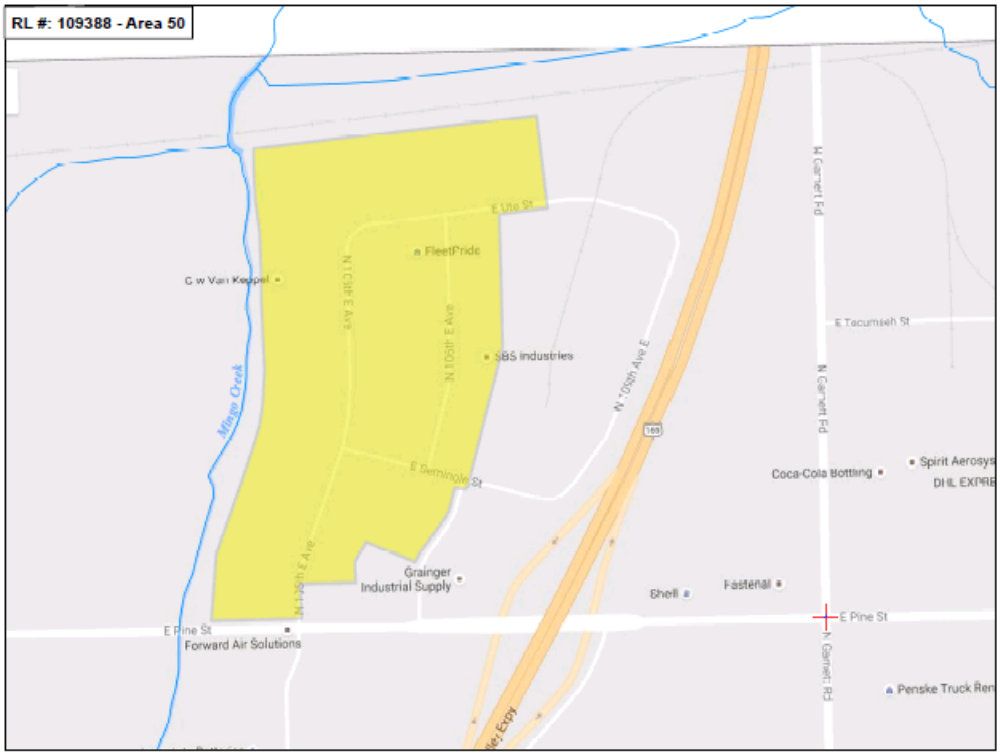
Repetitive Loss Area # 50

Lower Mingo Creek Mainstem
Wolf Creek Industrial Park
E. Pine St. & N. 105th E. Ave. Area

Overview

Repetitive Loss Area #50 is comprised of 44 commercial properties in the Wolf Point Industrial Parkway West subdivision. The structures are situated on generally level ground, at between 600 and 610 ft. elevation, in the original course of Mingo Creek, between E. Pine on the south and the BNSF railroad on the north, and from Mingo Creek on the west to N. 106th E. Ave. on the east. Before the massive Mingo Creek project of the 1980s and 1990s, the 100-year floodplain in this area reached to about the 614-ft. contour. It has since been lowered to the 611-ft. contour. The slab-on-grade structures were built between 1971 and 2005, with all but eight constructed in the 1970s. The major uses are warehouse storage and light industry. Eight properties have made 13 damage claims between 1981 and 2009 for a total of $2,481,145. There is one repetitive loss property, which made claims in 1984 ($227,383), 2000 ($11,855) and 2006 ($3,060) for a total of $242,298. One other property made two claims: one in 1998 for $61,556, and the second in 2009 for $303,991. There have been no damage claims in the RLA since 2009.



RLA #50 is located on the east bank of Mingo Creek between E. Pine St. and the BNSF railroad.

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 streams, 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 may have been the result of storm sewer backup or overland flow. The location of RLA #50 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.

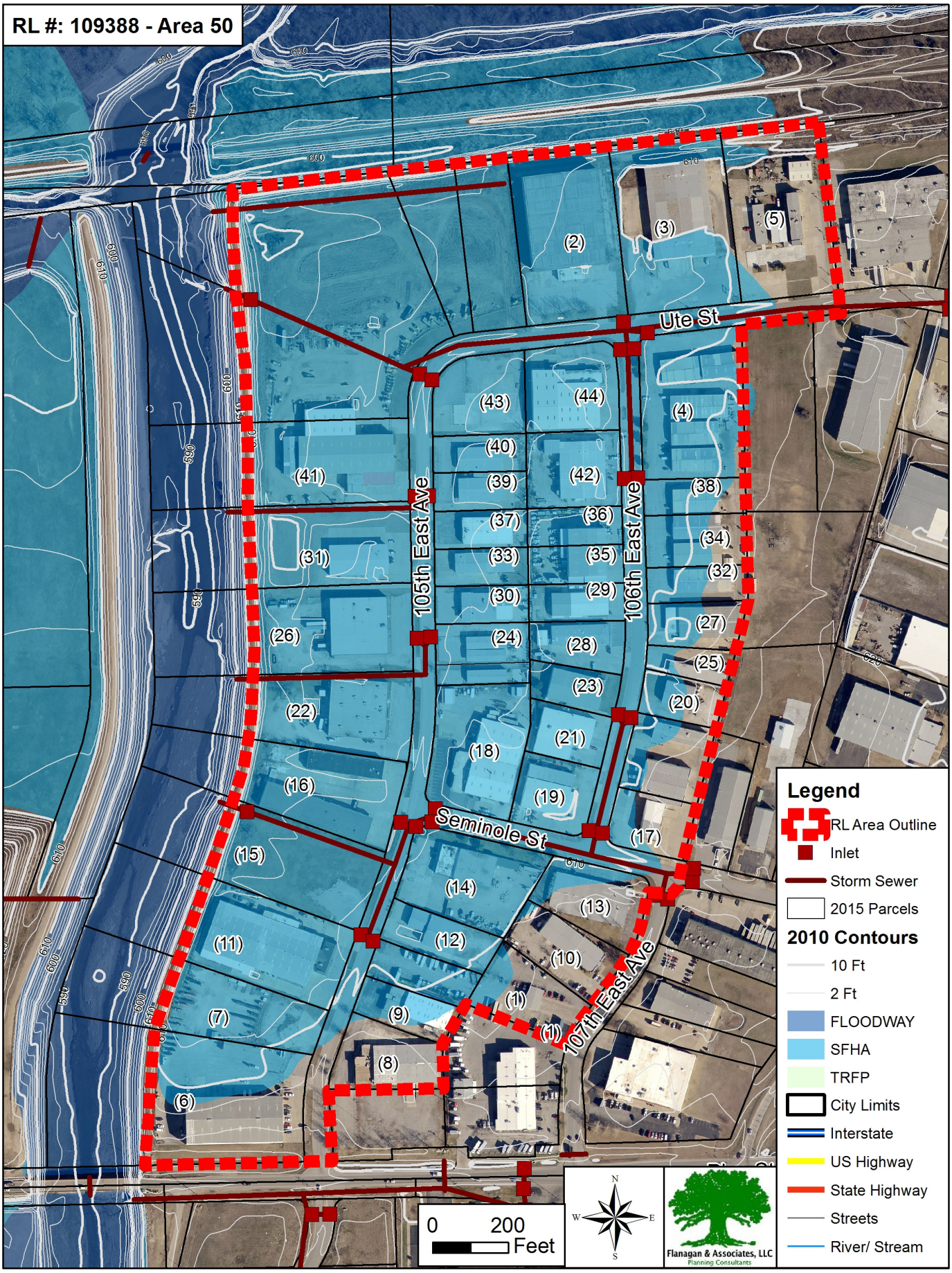
II. Location

Mingo Creek is a 16-mile-long, right-bank tributary to Bird Creek that drains about 61 square miles of southeast and northeast Tulsa. The creek's mainstem has its headwaters in Tulsa's Woodland Hills area and flows generally east from E. 65th St. and S. 78th E. Ave., across S. Memorial Blvd. and along the north side of Woodland Hills Mall to E. 58th St. and S. Mingo Rd., where it turns north through residential, commercial and industrial developments, generally between Mingo Rd. and US Hwy 169 (Mingo Valley Expressway), to its junction with Bird Creek at the Northside Wastewater Treatment Plant near E. 57th St. N.

Repetitive Loss Area #50 is in the Lower Mingo Creek basin, on the east bank of Mingo Creek between E. Pine St. on the south and the BNSF railroad tracks on the north, and from Mingo Creek on the west to N. 106th E. Ave. on the east. The RLA is comprised of 44 commercial structures on 50 lots in the Wolf Point Industrial Parkway West subdivision.

Looking north on Mingo Creek from the E. Pine St. bridge. RLA #50 is at the right, behind the levee.

The structures in RLA #50 are slab-on-grade commercial buildings and are constructed at a location that was at one time in the meandering bed of Mingo Creek. In 1970 the creek's channel was straightened and relocated several hundred feet to the west to accommodate the Wolf Point industrial park. The site was filled and leveled, and a levee constructed on the west and north sides of the property to protect it from overbank flooding from Mingo Creek. The terrain on which the development is situated is generally level floodplain, rising to the east from about 600 feet at the creek to 610 feet near N. 106th E. Ave.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SFHA
TRFP
City Limits
Interstate
US Highway
State Highway
Streets
River/ Stream

III. History

Development

The 44 commercial properties in RLA #50 were developed in the Wolf Point Industrial Parkway West addition between 1970 and 2005, with all but eight constructed in the 1970s. The major uses of the structures are warehouse storage, light and heavy industry and offices. The surrounding terrain is essentially level, rising slightly to the east southeast from 600 ft. at Mingo Creek to about 610 ft. near N. 107th E. Ave. and E. Pine St. The structures are slab-on-grade on filled land that had once been in the meandering channel of Mingo Creek. In the process of development, the course of the creek was straightened and moved about 400 feet to the west, the land filled to an elevation of about 602 to 610 feet, and a 612 ft. elevation levee constructed on the west and north sides of the property. The first-finished-floor elevations of the structures in the RLA are between 604 feet and 615 feet in elevation. A storm sewer system emptying into Mingo Creek via flap-gates drained overland flow accumulation within the development that would otherwise pond in the northwest corner behind the levee. It was believed that the levees and storm sewers would protect the site from both overbank flooding from Mingo Creek and internal flooding from overland flow. Subsequent events proved otherwise. Although the system worked well for the floods of 1974 and 1976, the Memorial Day flood of record in 1984 resulted in extensive flooding. All but one property in the RLA are currently within or touched by Mingo Creek's 100-year floodplain, which reaches up to the 611-ft. contour, according to the City's flood hazard map.

Flooding

The *Lower Mingo Creek Master Drainage Plan* of March 1988, states that historically Mingo Creek has flooded about every two or three years. Particularly severe floods occurred in October 1959, May and July 1961, June 1974, May 1976 and May 1984, with the last-named event being the flood of record for the basin. The flood of May 1984 generated eight paid damage claims within the RLA for a total of $2,099,360. Flooding occurred again in 1989 (one claim for $4,383), 1998 (one claim for $61,556), 2000 (one claim for $11,855) and 2009 (one claim for $303,991). Total claims for the RLA are $2,481,145. There have been no flood damage claims since 2009.

Improvements

Massive flood-control improvements were made to Mingo Creek and its tributaries in the 1980s and 1990s as part of the multifaceted Mingo Creek Project and other initiatives by the US Army Corps of Engineers and the City. These changes include the channelization of nine miles of Mingo Creek, the enlargement or removal of stormwater conduits and bridges, and the installation of 23 detention facilities on both Mingo Creek and its tributaries. In 1986 the City excavated the channel beneath the BNSF railroad bridge and in 1988 removed the severe downstream bottleneck at E. 36th St. N. In 1991 the City excavated accumulated sediment along the lower reach of the creek and widened the channel by 50% between I-244 and the BNSF bridge. Additional fill was added to the private levee at Wolf Point in 1998. These measures have theoretically lowered the 100-year flood hazard zone in the Wolf Point addition from 611 to 605 feet. However, as the Wolf Point levee is not certified, all but one of the properties in RLA #50 remain in the

City's 100-year regulatory floodplain, and all structures are within FEMA's 500-year flood hazard zone.

IV. Research and Analysis

The analysis of Repetitive Loss Area #50 was conducted by the Project Team through interviews with City officials, research into Engineering Services and Stormwater Drainage files, including the several of the master drainage plans for Mingo Creek and its tributaries, 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:

- *Mainstream Channel and Detention Sites, Mingo Creek, Tulsa, Oklahoma*, January 2003, US Army Corps of Engineers
- FEMA Regulatory Flood Map 40143C0261L
- *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
- *Lower Mingo Creek Master Drainage Plan, Final Report*, City of Tulsa, August 1991.
- "Inspection of Non-Federal Flood Protection Facility, Wolf Point Levee," City of Tulsa, May 1, 1997.
- *Mainstem Channel and Detention Sites, Mingo Creek, Tulsa, Oklahoma, Operation and Maintenance Manual*, US Army Corps of Engineers, January 2003.
- Mars, Tim. "The Effects of Urbanization on the Mingo Creek Watershed," 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 # 50.

Flood Insurance Data

Twenty-five of the properties in RLA #50 currently carry flood insurance.

Claims Data.

The repetitive loss property in RLA #50 has submitted three claims totaling $242,298 for structural and contents damage—one on May 27, 1984 for $227,383, a second on July 31, 2000 for $11,855, and a third on August 9, 2006 for $3,060. Three other properties in the RLA have made multiple claims. Altogether, seven properties in RLA #50 have made 13 paid claims totaling $2,481,145. Eight of the 13 claims, accounting for 85% of all the RLA's flood damage, were for the flood of record of May 1984. There have been no flood damage claims in the RLA since 2009.

RLA #50 is built on what was once the meandering course of Mingo Creek. The channel was relocated about 400 feet to the west and the land filled to accommodate the new industrial park.

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 #50 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 #50 are comprised of 44 commercial buildings whose primary uses are warehouse storage and light industry.

Foundation Type.

The type of foundation was determined by field investigation and query of Tulsa County Assessor records. The commercial buildings are 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. 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	Office	1978	SOG	Fair	Mingo Creek
Property 2	Heavy Industry	1971	SOG	Average	Mingo Creek
Property 3	Light Industry	1971	SOG	Average	Mingo Creek
Property 4	Warehouse	1979	SOG	Average	Mingo Creek
Property 5	Warehouse	1979	SOG	Average	Mingo Creek
Property 6		0	SOG		Mingo Creek
Property 7	Light Industry	1979	SOG	Fair +	Mingo Creek
Property 8	Heavy Industry	1973	SOG	Average	Mingo Creek
Property 9	Warehouse	1974	SOG	Average	Mingo Creek
Property 10	Warehouse	1974	SOG	Average	Mingo Creek
Property 11	Warehouse	1979	SOG	Average	Mingo Creek
Property 12	Light Industry	2005	SOG	Fair +	Mingo Creek
Property 13	Warehouse	1978	SOG	Average	Mingo Creek
Property 14	Warehouse	1973	SOG	Average	Mingo Creek
Property 15	Warehouse	1977	SOG	Average	Mingo Creek
Property 16					Mingo Creek
Property 17	Warehouse	1973	SOG	Average	Mingo Creek

Address	Structure Type	Year Built	Foundation Type	Building Condition	Flood plain
Property 18	Warehouse	1980	SOG	Fair +	Mingo Creek
Property 19	Warehouse	1975	SOG	Average	Mingo Creek
Property 20	Light Industry	1971	SOG	Average	Mingo Creek
Property 21	Warehouse	1973	SOG	Average	Mingo Creek
Property 22	Warehouse	1979	SOG	Average	Mingo Creek
Property 23	Warehouse	1974	SOG	Average	Mingo Creek
Property 24	Warehouse	1973	SOG	Average	Mingo Creek
Property 25	Warehouse	1980	SOG	Average	Mingo Creek
Property 26	Warehouse	1980	SOG	Average	Mingo Creek
Property 27	Warehouse	1979	SOG	Average	Mingo Creek
Property 28	Light Industry	1975	SOG	Average	Mingo Creek
Property 29	Office	1974	SOG	Average	Mingo Creek
Property 30	Light Industry	1982	SOG	Average	Mingo Creek
Property 31	Warehouse	1977	SOG	Average	Mingo Creek
Property 32	Warehouse	1973	SOG	Average	Mingo Creek
Property 33		0			Mingo Creek
Property 34	Light Industry	1971	SOG	Average	Mingo Creek
Property 35	Light Industry	1974	SOG	Average	Mingo Creek
Property 36	Light Industry	1978	SOG	Average	Mingo Creek
Property 37	Warehouse	1981	SOG	Average	Mingo Creek
Property 38	Office	1979	SOG	Average	Mingo Creek
Property 39	Parking Lot	1985	SOG	None	Mingo Creek
Property 40	Parking Lot	1974	SOG	None	Mingo Creek
Property 41	Office	1973	SOG	Average	Mingo Creek
Property 42	Light Industry	1974	SOG	Average	Mingo Creek
Property 43	Light Industry	1984	SOG	Average	Mingo Creek
Property 44	Office	1975	SOG	Fair	Mingo 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 #50 are notified annually that their structures are located in a Repetitive Loss Area, and are potentially subject to flood damage from 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 11 comments concerning flooding by property owners in RLA #50. Seven owners of properties on N. 105th and N. 106th E. Ave. stated that their properties have not flooded since purchase—in 1990, 2003, 2004, 2007 and 2012. Another owner of a property on E. Ute St. said his property never flooded more than the parking lot, even in 1984. An owner of a property on N. 107th E. Ave. reported 18 inches of water in the storage yard in 1984, and another on N. 105th E. Ave. said that in 1984 they had 5 feet of water on the property. Another owner of a structure on N. 106th E. Ave. said his property had flooded in 1984, but that the Mingo Creek project had solved the problem.

The developer of the Wolf Point Industrial Park West believes that the reinforced levee on the west and north sides of Wolf Point, the upstream detention facilities on Mingo Creek, the dredging and widening of the creek on the west side of the property, and the removal of constrictions at 36th St. N. and the BNSF bridge have eliminated the threat of overbank flooding from Mingo Creek. He thinks the only remaining problem is overland flow from the south and east into Wolf Point that ponds in the northwest corner of the industrial park when high water on the creek closes the flap-gates on the park's internal drainage system. The solutions proposed by the Wolf Point Owners Association for what local drainage problems remain are to install a pump system in the northwest corner of the park to discharge collected runoff into the creek when the flap-gates are closed, and/or put in a 15 acre-feet detention facility in the industrial park's northwest quadrant.

Conclusions

RLA #50 has experienced flood damage from overbank flooding on Mingo Creek and overland flow from the south and east into the industrial park. Much work has been done to eliminate flooding in the RLA both by the property owners and by the City of Tulsa. The multifaceted Mingo Creek project undertaken by the City of Tulsa and the US Army Corps of Engineers enlarged conduits beneath downstream constrictions at E. 36th St. N. and the BNSF railroad bridge, widened the Mingo Creek channel by 50% in the reach between the BNSF bridge and I-244, and added 23 detention facilities upstream from the RLA. A Wolf Point property owners group was formed to fund improvements to the industrial park's drainage and flood protection system, which included adding new fill to reinforce the levee from the BNSF bridge to E. Pine St. However, because the Wolf Point levee is uncertified, the 100-year floodplain in this reach of the creek remains at 611 ft. The ground surface elevation of the park varies, but is generally at between 602 and 610 feet. The first-finished-floor elevations of all but seven of the 44 properties of RLA #50 are below 611 feet, and thus within the City's 100-year floodplain. All of the properties in the RLA are in FEMA's 500-year floodplain. Although the Wolf Point property owners group has proposed installing a detention facility in the northwest corner of the property along with a pump system to discharge overland flow accumulation when Mingo Creek is too high to allow the flap-gates on the drainage system to open, neither of these measures has been implemented as of this writing (June 2017).

V. Mitigation Measures

Overview

The massive Mingo Creek Project undertaken by the City of Tulsa and the US Army Corps of Engineers in the wake of the devastating flood of May 27, 1984 has largely eliminated overbank and backup flooding in this reach of Mingo Creek. What flooding remains is primarily due to overland flow in the generally level terrain. Because the Wolf Point levee has not been certified, all but one property in the RLA remain within the City's 100-year floodplain. The RLA remains exposed to overbank flooding from Mingo Creek, and from overland flow which accumulates in the northwest corner of the industrial park. As Wolf Point is a private development with a privately-owned and maintained levee, its Property Owner's Association is responsible for implementing those measures needed to protect the development from future flood damage. While enormous progress has been made in reducing or eliminating flooding on Mingo Creek, the properties remain at risk to overbank and overland flow flooding during storms of greater than100-year magnitude, like the 300-year storm of May 1984.

Individual Flood Protection Measures

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, installing detention ponds and pump systems 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 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

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

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 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. Contact the Customer Care Center at (918) 596-2100.This is the most feasible solution for areas with flooding due to overland flow, as is the case with several properties in RLA #50.

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 with 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. To get more information about this program, contact the Customer Care Center at (918) 596-7777.

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 structures in RLA #50 are not 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.

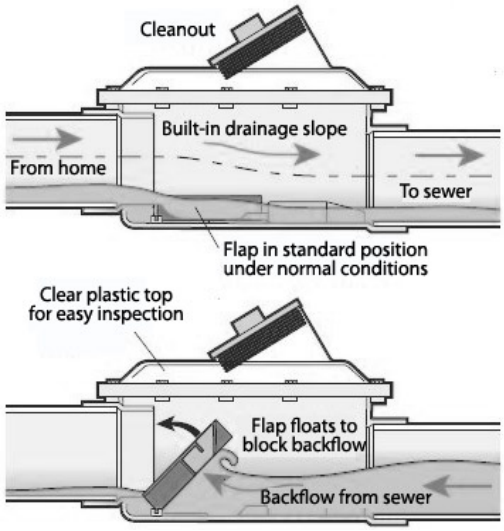
Wet Floodproof Your Garage. The garage, with its slab-on-grade construction, is one of the most vulnerable areas of your home to overland flow flooding. Remove, relocate, elevate, or otherwise protect items that can be damaged from flooding.

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. Culvert blocking by limbs, grass cuttings and other debris could contribute to future flooding in RLA #50. Storm sewer inlets and outlets, particularly RLA #50's flap-gates, must be regularly inspected and kept free of blockage. Residents and property owners should do their part to keep storm drains and bar ditches clear of brush and debris, and report trees that have fallen into the creek channel and are blocking flow.

Correct Sanitary Sewer Backup Problems. Sanitary sewer backup can be a problem in low-lying, flood-prone areas like RLA #50. The installation of backflow prevention valves in 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 #50.

- 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 #50, the funding of needed improvements, including levee inspection, maintenance and certification, will have to be borne by the individual property owner.

VII. Conclusions and Recommendations

Repetitive Loss Area #50 is comprised of 44 commercial properties on 50 lots along the right bank of Mingo Creek, between E. Pine St. and the BNSF railroad bridge. There is one repetitive loss property in the RLA, a slab-on-grade commercial/industrial building located near E. Pine St. and N. 105th E. Ave. In all, eight properties have made 13 claims for structure and contents damage between 1981 and 2009 for a total of $2,481,145. All of the structures are slab-on-grade and situated on terrain that varies from 602 to 610 feet in elevation. Seven of the 44 properties have first-finished-floor elevations above 611 feet. Although FEMA has approved a request from the owners of Wolf Point to lower the SFHA from 611 to 605 feet, the ruling has not been adopted by the City of Tulsa. All but one property in the RLA remain within the City's 100-year flood hazard zones, and all are within FEMA's 500-year floodplain. Although the properties are theoretically protected by 612-ft.-high levees on the western and northern sides of the development, the levees are not certified. In addition, the flap-gates that drain overland flow from the industrial park during heavy rains are routinely closed by water pressure when Mingo Creek is in flood. Several flood control measures have been proposed by the Wolf Point Property Owners Association, including installing a detention pond and pump system in the northwest quadrant of the industrial park to eliminate overland flow accumulation on the landward side of the levees. These measures have not yet been put in place.

Property owners are encouraged to maintain flood insurance. The City of Tulsa is a Community Rating System (CRS) Class II Community, and all property owners qualify for up to a 40% discount on their flood insurance premiums. Property owners 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.