

From Rooftop to River

*Tulsa's Approach
to Floodplain
and Stormwater
Management*

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Dedication

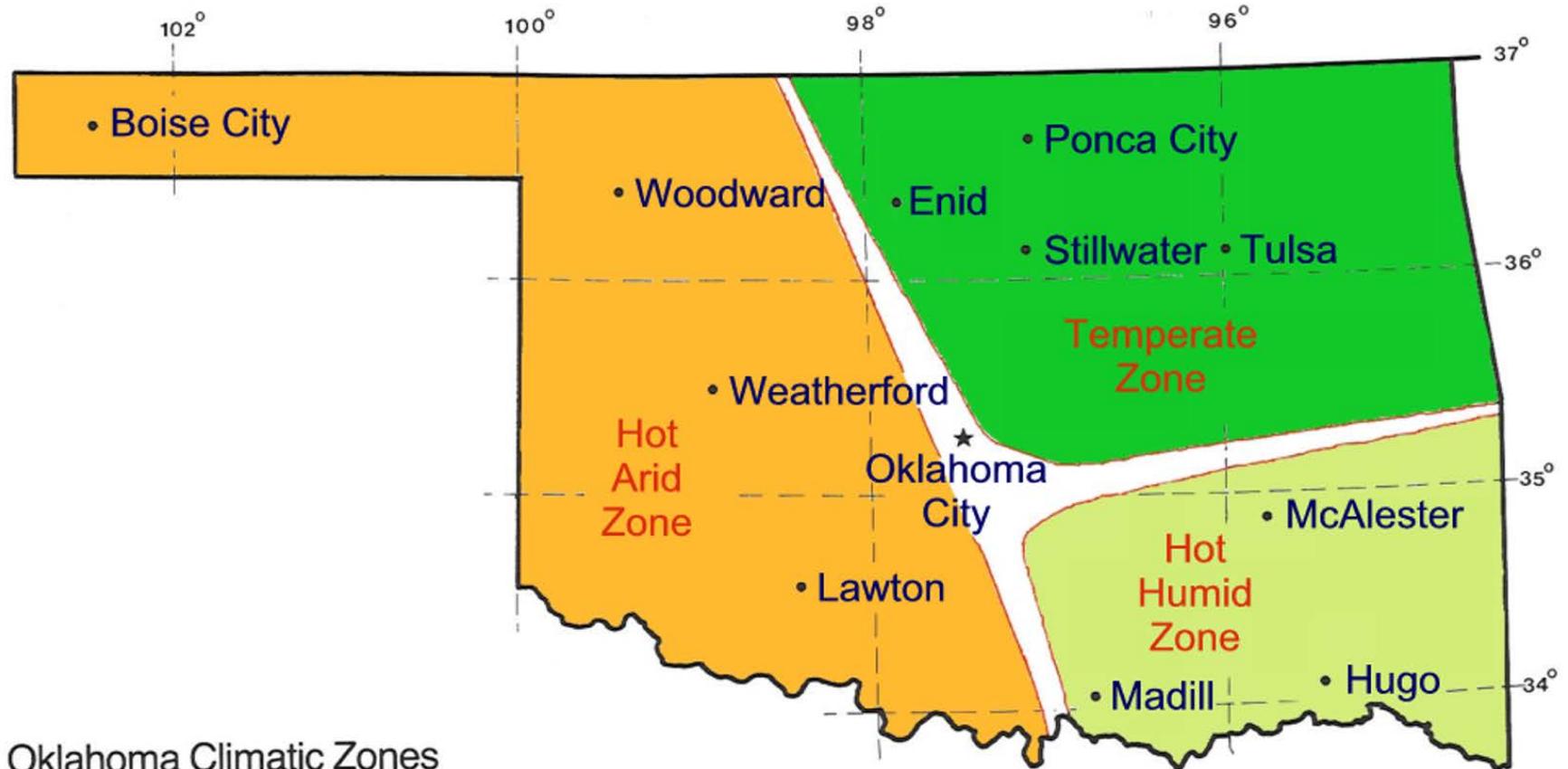
**To the
Individuals who
dedicated their
lives to the
protection of
their fellow
citizens**

The Keys to Tulsa's (Anybody's) Successful Floodplain Management Program:

- 1. Events**
- 2. Media**
- 3. Citizen Involvement**
- 4. People**
- 5. Elected Officials/Govt. Staff**
- 6. Organizations/Partnerships**
- 7. Programs**
- 8. Funding**

History

1898 - 1970



Oklahoma Climatic Zones

Oklahoma is at the Convergence of the Three Climatic Zones, Making for Extreme Weather Patterns



May 23, 1908



1957 Flooding on the Arkansas River

THOUSANDS FLEE AREA HOMES



—World Staff Photo by D. LeRoy Randall

Many Evacuate Brookside, Garden City; More Rains Swell Oklahoma Streams

DAMAGE RUNS HIGH; RECORD CRESTS MOUNT

Many Roads Closed, Bridges Out; Worst Rampage on Cimarron

From World Wire Reports
Floodwaters drove hundreds more Oklahomans from their homes Friday as new deluged rivers and streams, already swollen by torrential rains of 19 to 20 inches since Wednesday night.
Residents were evacuated from a half-dozen towns in the state Friday and jittery Tulsa braced for possibly its worst flood in history Saturday.

Arkansas Expected to Reach Peak Here Tonight; Some in Imperiled Region Resist Evacuation Pleas

By TRAVIS WALSH
Of The World Staff

More than 1,000 Tulsans moved to higher ground Friday and early Saturday as the debris-laden waters of the Arkansas river slowly rose toward a record crest expected to flood Garden City and much of Brookside.
Hundreds of others in the area classed as "critical" went optimistically to bed Friday night without making an attempt to move to safety.

The Arkansas was expected to reach the flood stage of 19 feet before dawn and crest at between 25 and 28 feet by 10 p. m. Saturday.

The reading at the 11th st. bridge at 12:30 a. m. Saturday was 16 1/4 feet. Forecast levels were for 22.5 feet by 6 a. m. and 24.5 by noon.

Sheriff Glenn Brown and Joe Morris, civil defense director, Friday afternoon began urging evacuation of Garden City and the section of Brookside generally between 38th and 51st ave. and Riverside dr. and Peoria ave.

CD AND OTHER AGENCIES AID IN EMERGENCY

Red Cross, Firemen, Police, Guard Begin Flood Relief Work

By JOHN CLAYTON
Of The World Staff

Emergency evacuation efforts by the Civil Defense Administration in Tulsa—and coordinated agencies—were set in motion at 8 p. m. Friday for

School Authorities Pitch In

Larges crews of volunteer workers moved rapidly at Bixby Friday afternoon at the city's high school to construct barricades hoping they WOULD keep water out of the building's basement where boilers are located. Efforts were directed by Ray Tucker,

superintendent of schools, and Kenneth Goerth, school board president. Teachers and nearby residents pitched in to handle the necessary chore. (Related evacuations map, photos on Page 3 and stories, photo on Page 1, Sec. 2).

Boy Rescued Alive After 23 1/2 Hours Buried in Well

Card's Flood Area Flight DOCTORS SAY

Bixby Is Hoping for Best, Grimly Ready for Worst

By FRANK LESLIE
Of The World Staff

BIXBY, May 17—(AP)—Flooded residents of this lowland community were hoping for the best, but looking for the worst Friday as they prepared for the Arkansas' onslaught of flood

water. Three others, believed to be missing, were found while another man was reported missing.

Seven persons have died in the flood. Three others, believed to be missing, were found while another man was reported missing.

Missing Located
Lacked near Hennessy were Dr. and Mrs. Charles Hobbs of Kingfisher, Earl Hamill, Loyal, was reported safe at Hennessy. The missing man is Roland Bullock, about 50, of near Lindsay. He fell into Turner creek, about a flash flood near his home

near Friday night police estimated 25 per cent of the residents in the affected Brookside area had left their homes. They estimated about half the residents of Garden City had moved.

Local Unusually Close
At midnight, rising waters in the Cherry creek area north of the 51st st. bridge loomed ominously close to the Garden City area and sheriff's officers early Saturday sounded sirens and loudspeakers in an effort to get the people to move out.

"Once the water gets into that area, even if the river has not gone out of its banks, we can't get any trucks in there," Sheriff



The Promise of Urbanization



Typical Urban Drainage Channel



Concrete-Lined Single Purpose Urban Drainage Channel

The Floodplain Wars

1970 - 1984

What is Influencing the Trend of Increased Property at Risk

Current National Policy:

- Promotes intensification in risk areas
- Ignores changing conditions
- Ignores adverse impacts to existing properties
- Undervalues natural floodplain functions



Citizen Leaders Converge on City Hall to Demand Action on Flooding Problems



Stan Williams
&
Commissioner
Norma Eagleton



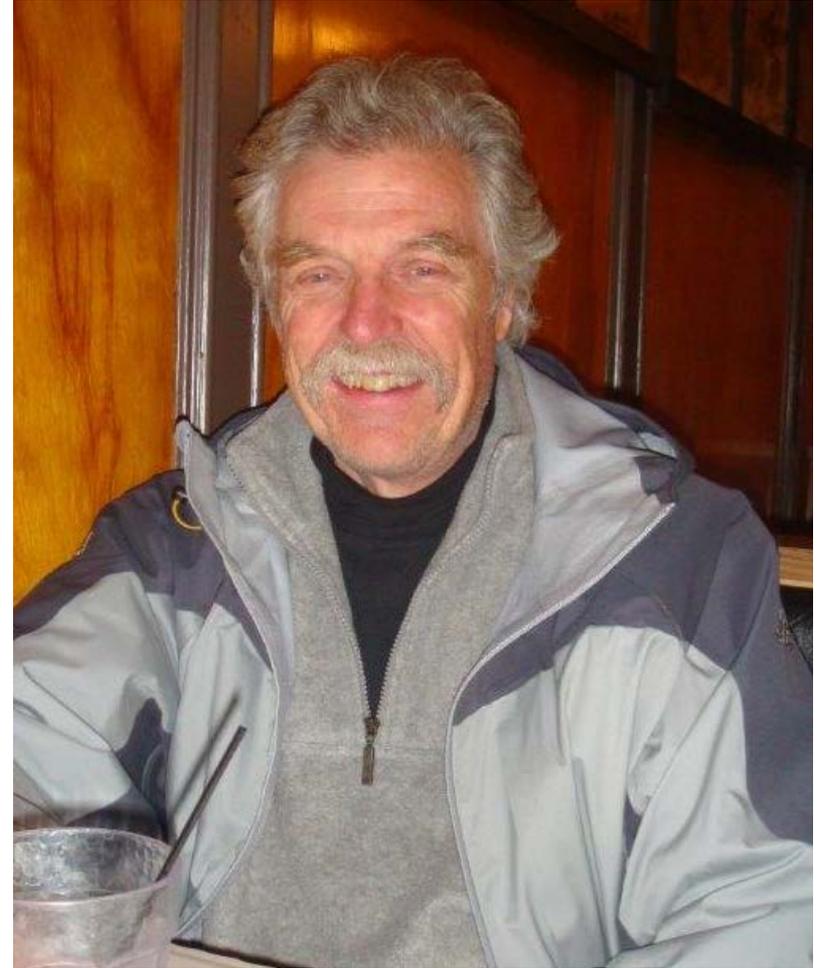
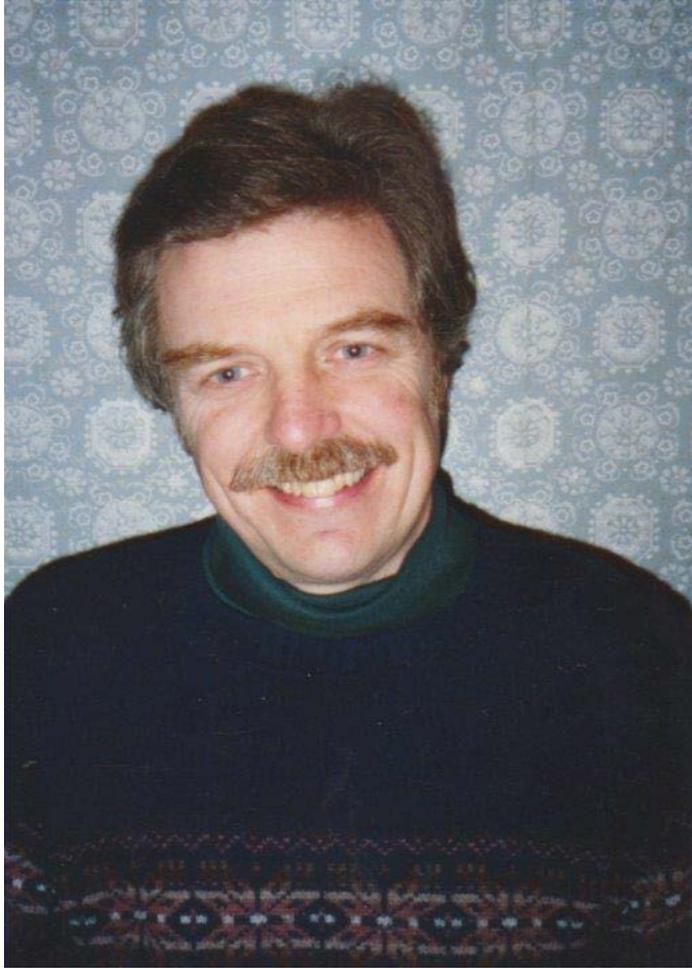
Honoring Charles Hardt, Tulsa's Floodplain Management Guiding Light



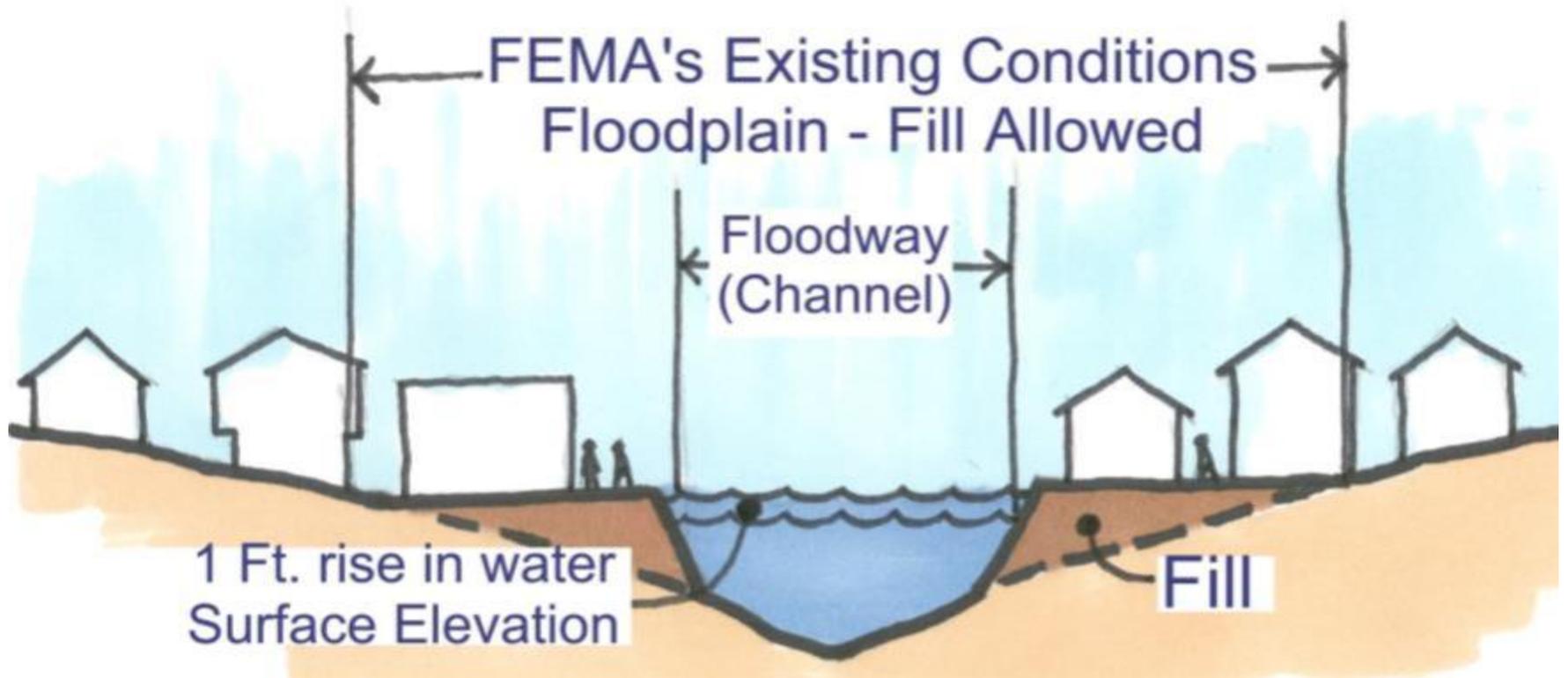
J.D. Metcalfe, Gilbert White, Ron Flanagan



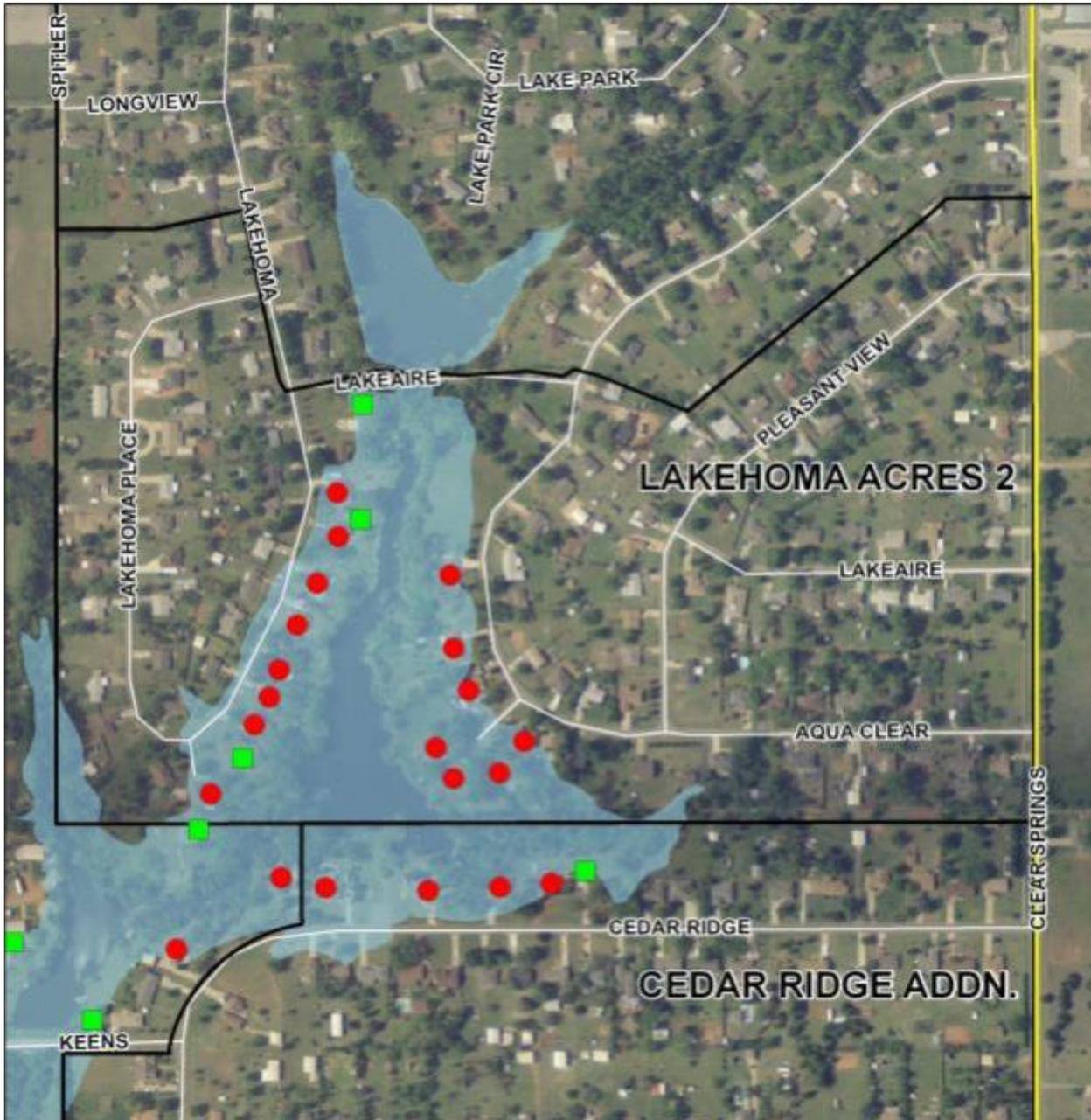
**Larry Larsen, Director,
Association of State Floodplain Managers**



Dr. Jon Kusler
Association of State Wetland Managers
A Lifetime of Service



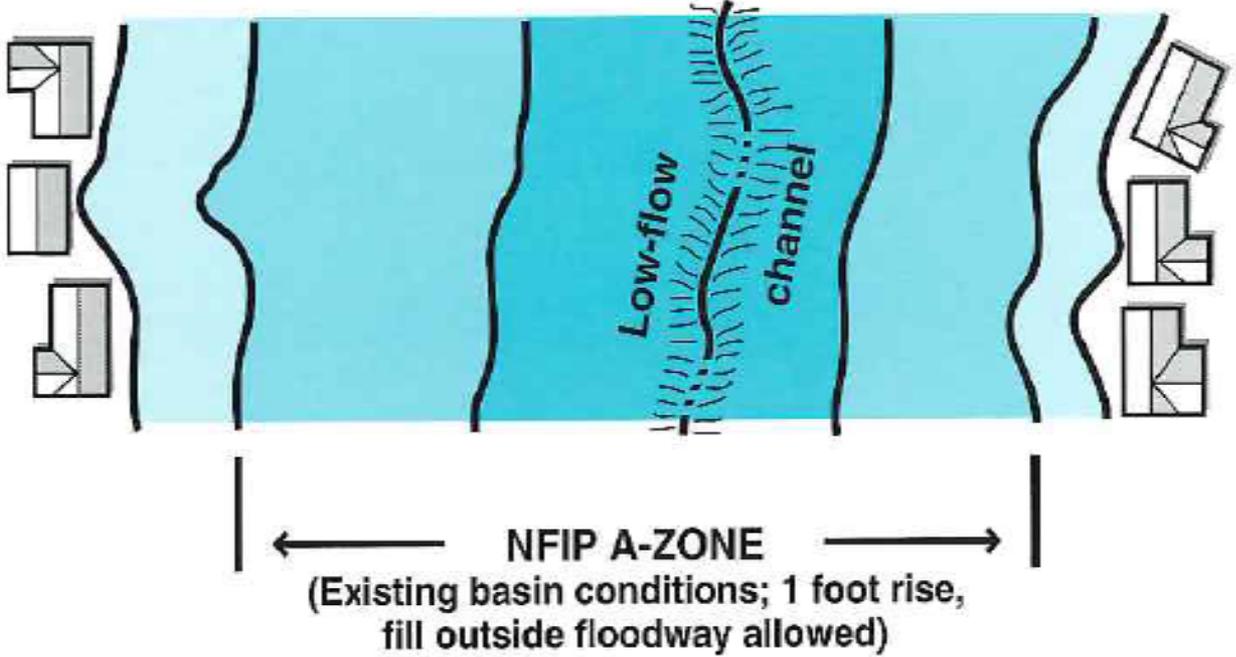
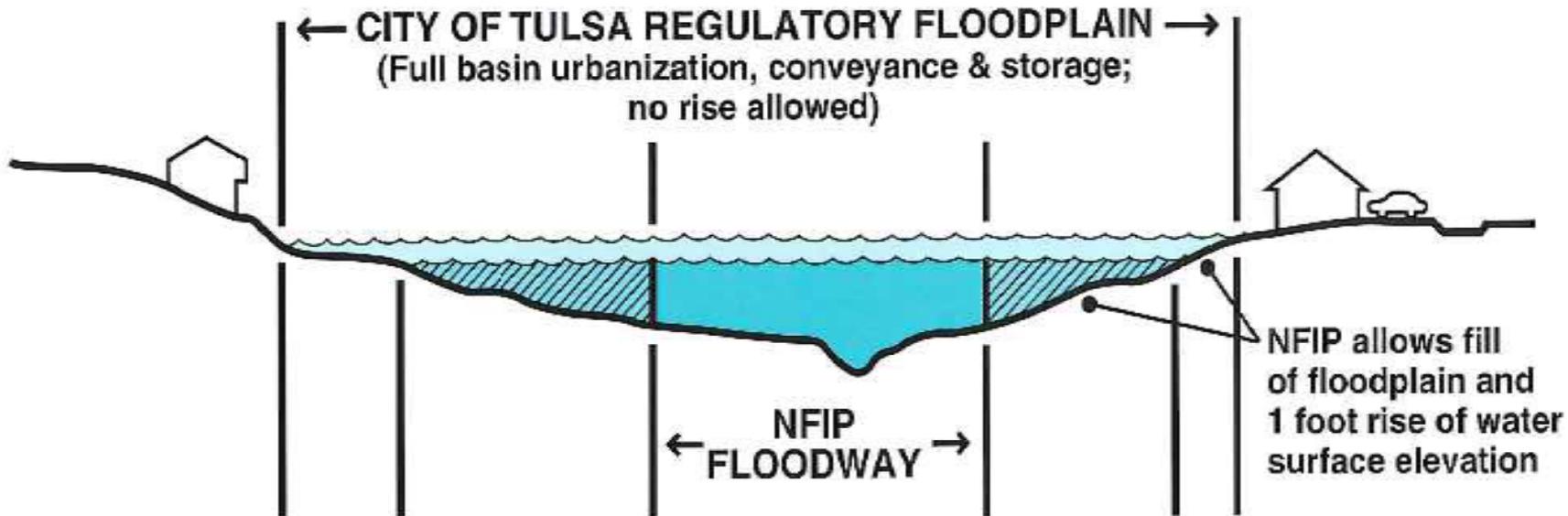
FEMA's NFIP Floodplain

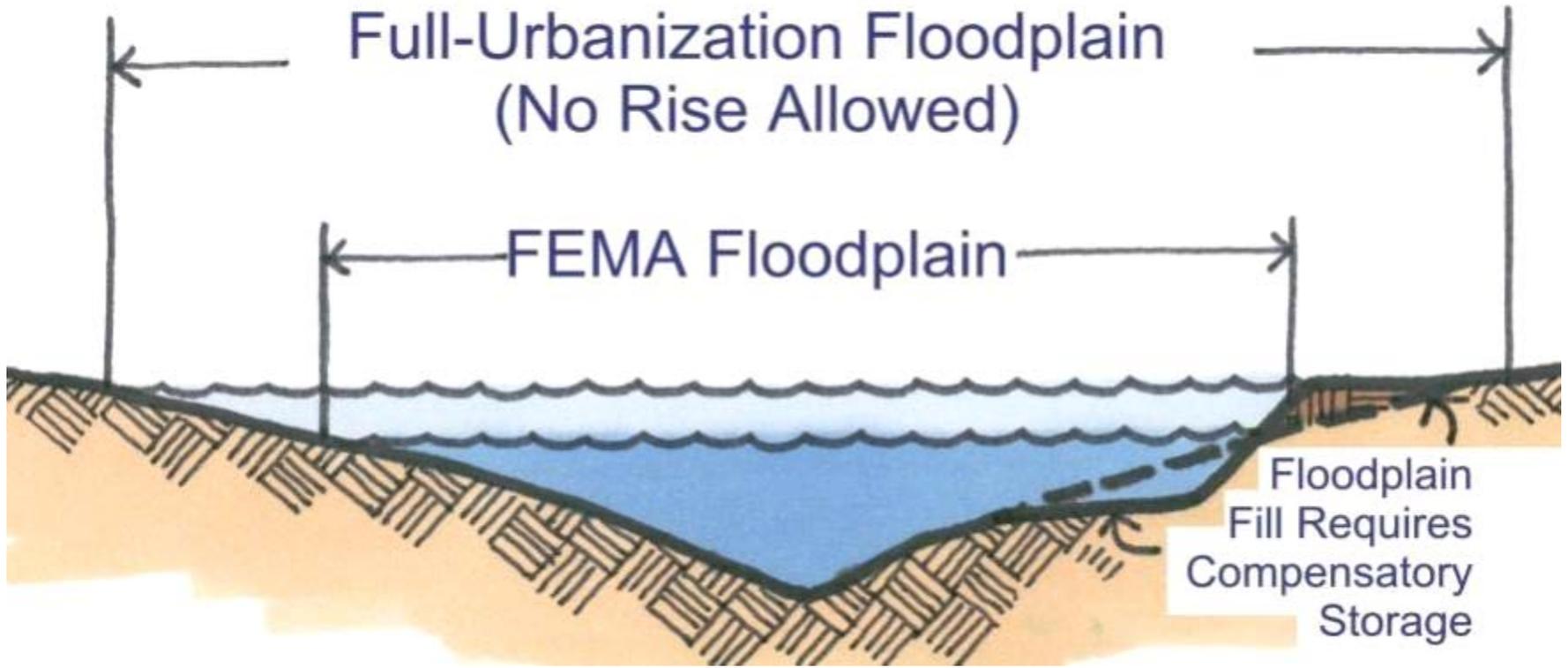


**Legally
Permitted
Development
after Basin
Urbanization**



- Use a comprehensive watershed approach
- CRS can provide a guide and Framework for going beyond the NFIP's minimum requirements





Tulsa's Regulatory Floodplain-

- Full Urbanization of the Basin**
- No Rise in Flood Elevation**
- No Net Loss of Floodplain Storage**



Commissioner Metcalfe, Ken & Ruth Wright



**Multi-Disciplinary Design Team-
Engineers, Planners, Architects, Landscape Architects**



Public Meetings to Review Plans

Basin-wide Comprehensive Master Drainage Plan

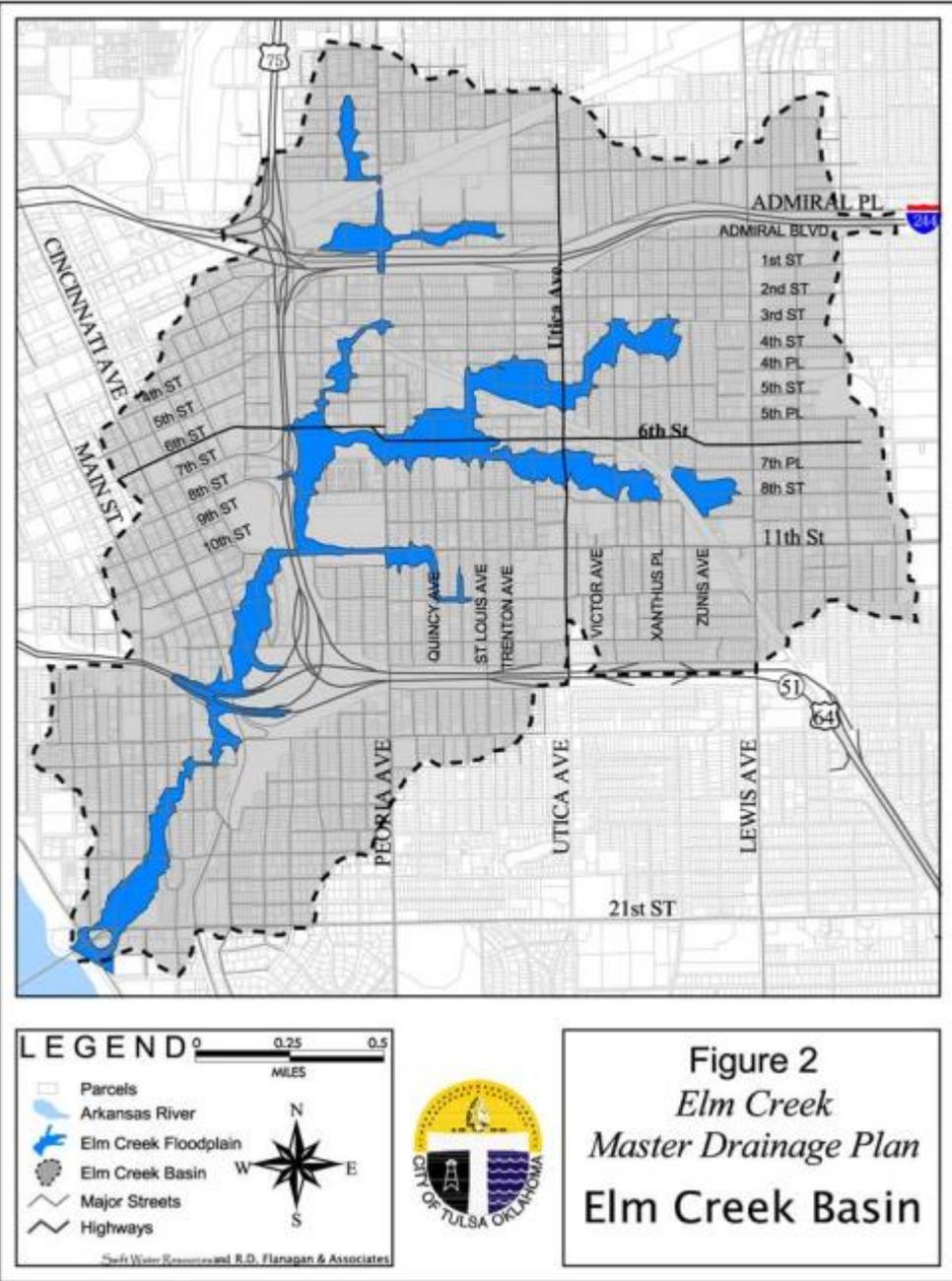
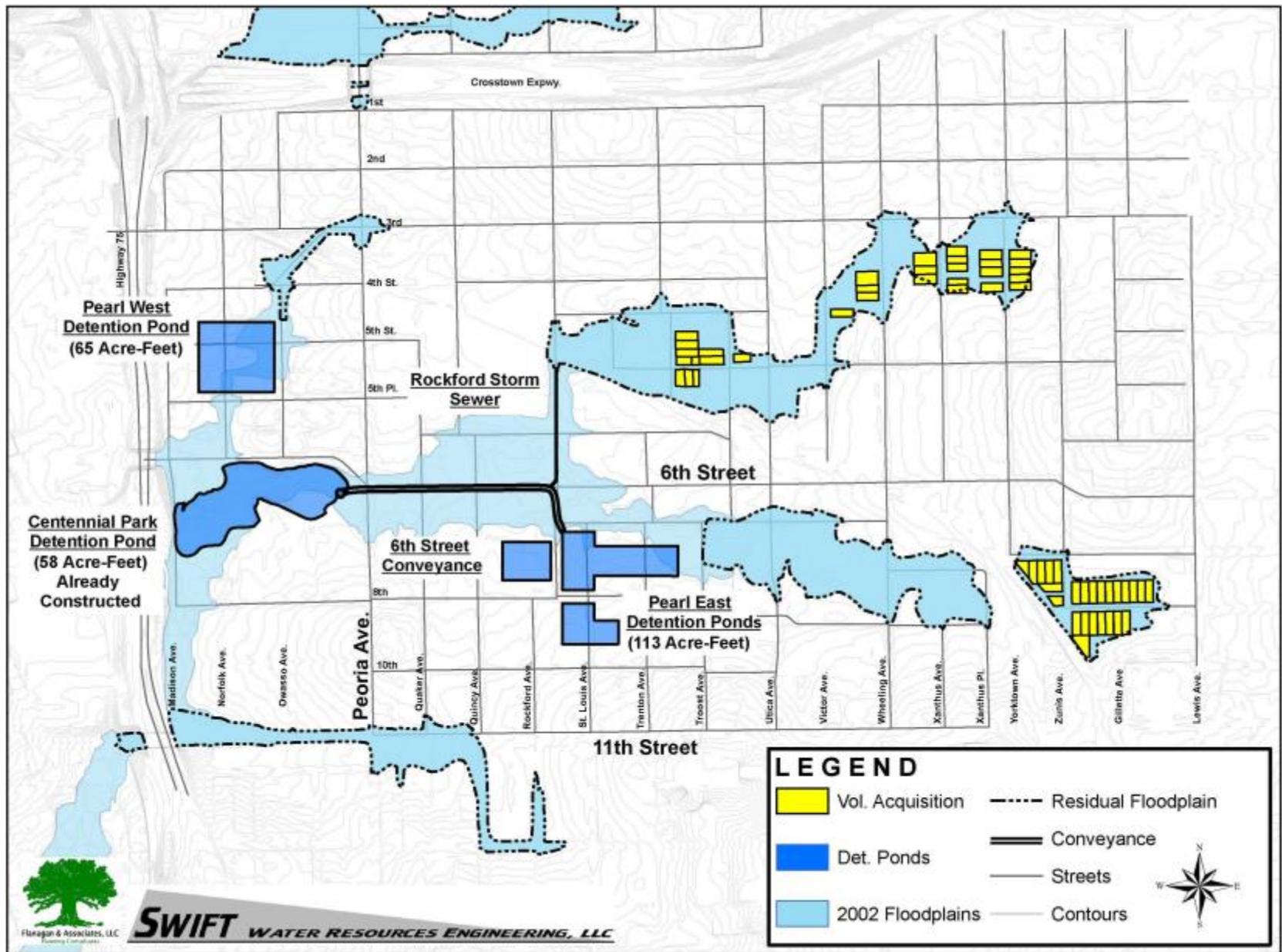


Figure 2
*Elm Creek
Master Drainage Plan*
Elm Creek Basin

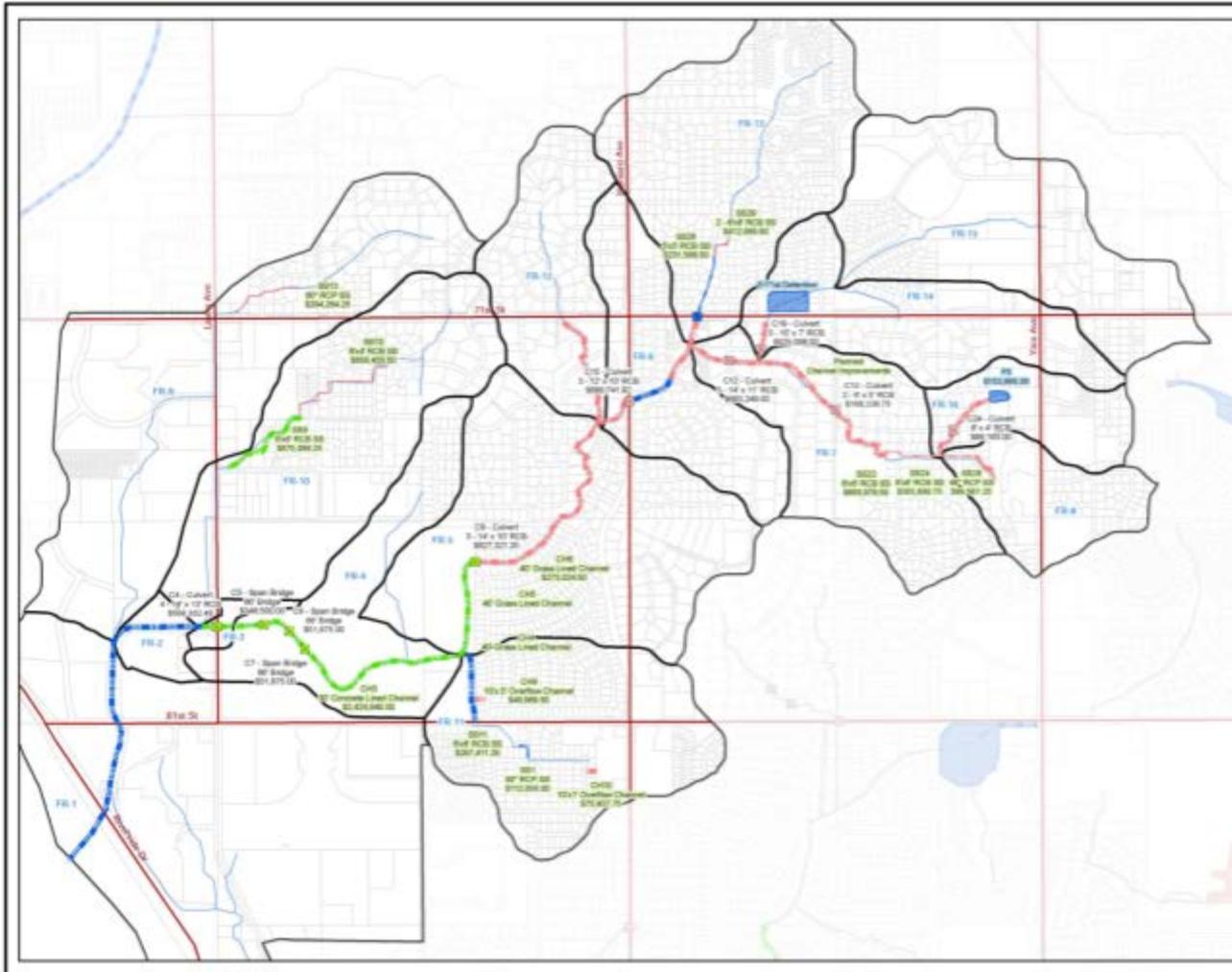


Recommended Plan- A Mix of Structural and Non-Structural Solutions



City of Tulsa Master Drainage Plan Update

Figure 2: Fred Creek Projects and FMAs



Legend

- Fred Creek Sub-FMA Boundaries
- Stream Centerlines
- Arterial Street
- Highway
- Bridge/Culvert Project Status**
 - Planned Bridge/Culvert
 - Funded Bridge/Culvert
 - Completed Bridge/Culvert
 - Planned Storm Sewer Culvert
- Detention Pond Project Status**
 - Completed Detention Pond
 - Funded Detention Pond
 - Planned Detention Pond
- Stormwater Project Status**
 - Completed Channel Project
 - Funded Channel Project
 - Planned Channel Project
 - Completed Stormsewer Project
 - Funded Stormsewer Project
 - Planned Stormsewer Project
 - Other Stormwater Improvements



Maps prepared for the City of Tulsa
by Meshek & Associates, Inc.

Map Date Mar 28, 2006	Figure 2
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Progress & Implementation

1984 - 1990



1984 Flood Damages to Residential Neighborhoods



Courageous Mayor Terry Young



Moving a Flooded House from the Mingo Creek Acquisition Area (1985)



Tulsa's Elected Floodplain Champions: Commissioners Patty Eaton & J.D. Metcalfe, Mayor Terry Young



City of Tulsa's Storm Drainage & Hazard Mitigation Advisory Board oversees the Flood Management Program



Our 1984 Vision for the Mingo Creek Floodplain



Tulsa's Arkansas River Parks Trail



River Parks Greenway Bicycle and Pedestrian Trail System

The City of Tulsa's CRS and Floodplain Management Program



CITY OF
Tulsa
A New Kind of Energy.



French Wetmore, Ann Patton



**Tulsa, Nation's First CRS Class 3 Community
October, 2000**



Mayor Susan Savage, Commissioner J.D. Metcalfe



**2003 – Tulsa Receives Nation's First
CRS Class 2 Designation**

City of Tulsa 2014 Official Notice

Flood Hazard Information About Your Property



CITY OF
Tulsa
A New Kind of Energy.

Your property is located in or near an area subject to flooding. It may be within a FEMA Special Flood Hazard Area (SFHA), or the City of Tulsa Regulatory Floodplain within the City of Tulsa.

The FEMA SFHA is an area subject to inundation by the base (one percent annual chance) flood.

**What does this mean for you?
Please read on.**

Flood Insurance Available for All Properties in Tulsa

The Federal Emergency Management Agency says that if your home is located in a high-risk flood zone, there is a 26 percent chance it will flood during the life of a 30-year mortgage. Up to 25 percent of all National Flood Insurance Program claims come from structures outside of high-risk areas. Did you know the City of Tulsa has a 40 percent discount for homeowners in a SFHA on flood insurance, and a 10 percent discount for all other properties? Most homeowners' policies do not cover flood losses. You can protect your home and contents through the National Flood Insurance Program.

You should obtain coverage for structure and contents. There can be more damage to the contents than the structure. Renters can buy contents coverage even if the owner does not insure the structure. There is a 30-day waiting period before the policy becomes effective.

Flood insurance is required by law in order to obtain federally secured financing to buy, build, or renovate a structure located in a FEMA SFHA. This financing includes federal grants, FHA and VA loans, and most conventional mortgage loans.

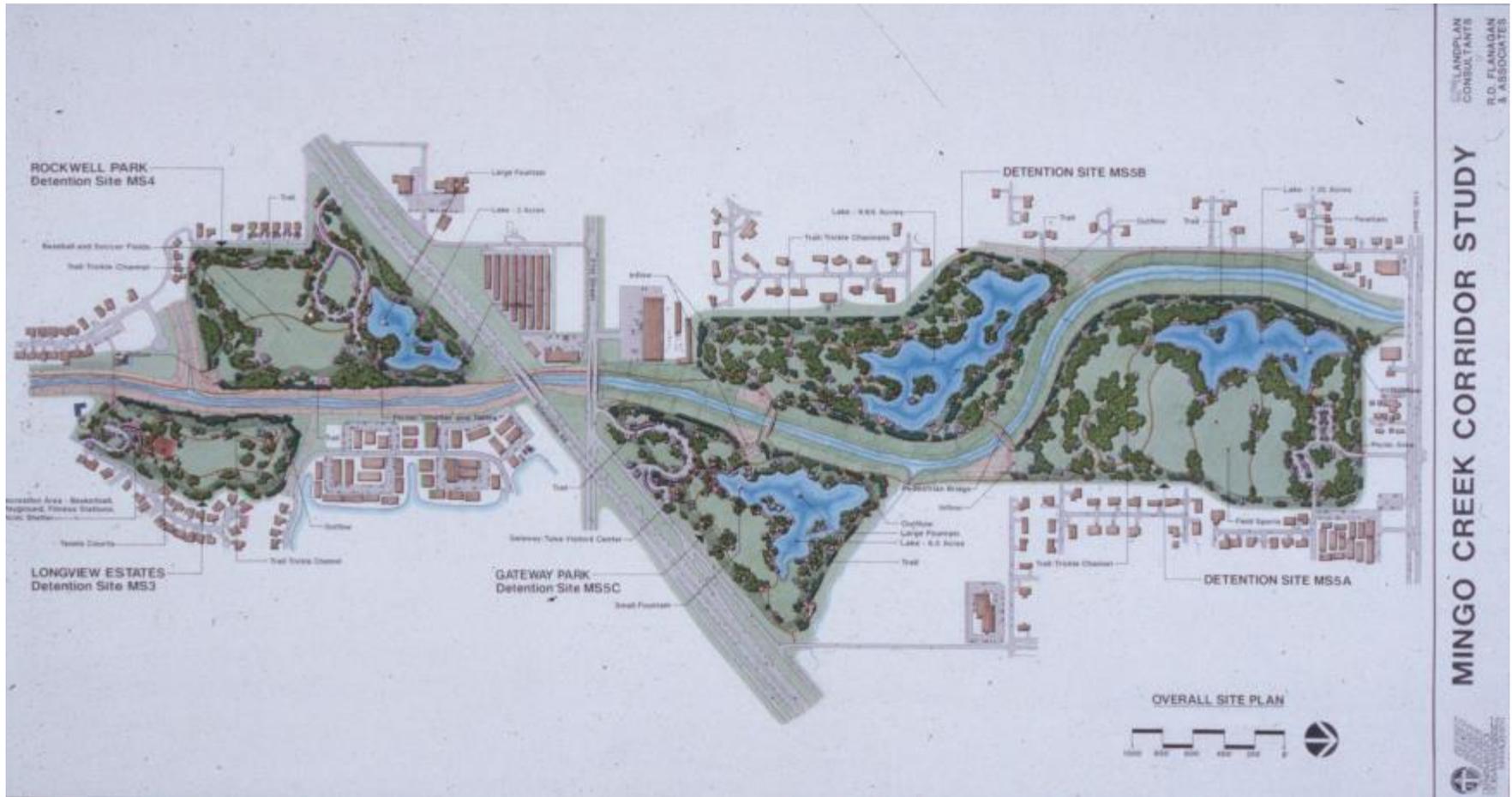
To find out more about flood insurance, contact any licensed property/casualty agent or broker—the same person who sells your home and auto policies. All agencies charge the same premiums.

Official City of Tulsa Floodplain Notice

Sent to all Floodplain Properties Annually



Mingo Creek Greenway Acquisition Area



City of Tulsa/Corps of Engineers' Plan for Stormwater Detention Ponds along Mingo Creek



Mingo Creek Detention Pond During Flooding Event



McClure Multi-Use Park & Stormwater Detention Facility

THIS IS NOT A PARK



but it looks like one, doesn't it?

It's a multi-purpose stormwater facility in Tulsa, Oklahoma.



Brookwood Regional Stormwater Detention Facility



Nelson Regional Detention Pond & Soccer Fields



Mingo Creek Multi-Use Regional Stormwater Detention Pond



Multi-Use Greenways along Tulsa's Urban Streams



Candlelight Acquisition Area Green Space



**Sustained Funding
Allows Improvements
& Ongoing
Maintenance**



Creating a more Natural Approach to the City's Streams



The New Look of Tulsa's Urban Drainage/Open Space



Tulsa has Dedicated 6,294 Acres of Floodplain to Open Space



Honoring Nature in the Urban Environment



Centennial Park Stormwater Detention Pond



Centennial Park Multi-Objective Detention Pond



**Ann Patton, Ruth & Ken Wright, Ron Flanagan
City of Tulsa's Recognition of Wright's Contributions to the City's
Floodplain Management Program**



Flood Fighter's Reunion

Top (L to R) **Stan Williams, Dr. Judith Finn, Ron Flanagan**
Bottom (L to R) **Ann Patton, Norma Eagleton, Nancy Kincaid, Janet Meshek**

Challenges

Primary Hazards of a Successful
Program:

Complacency
Apathy

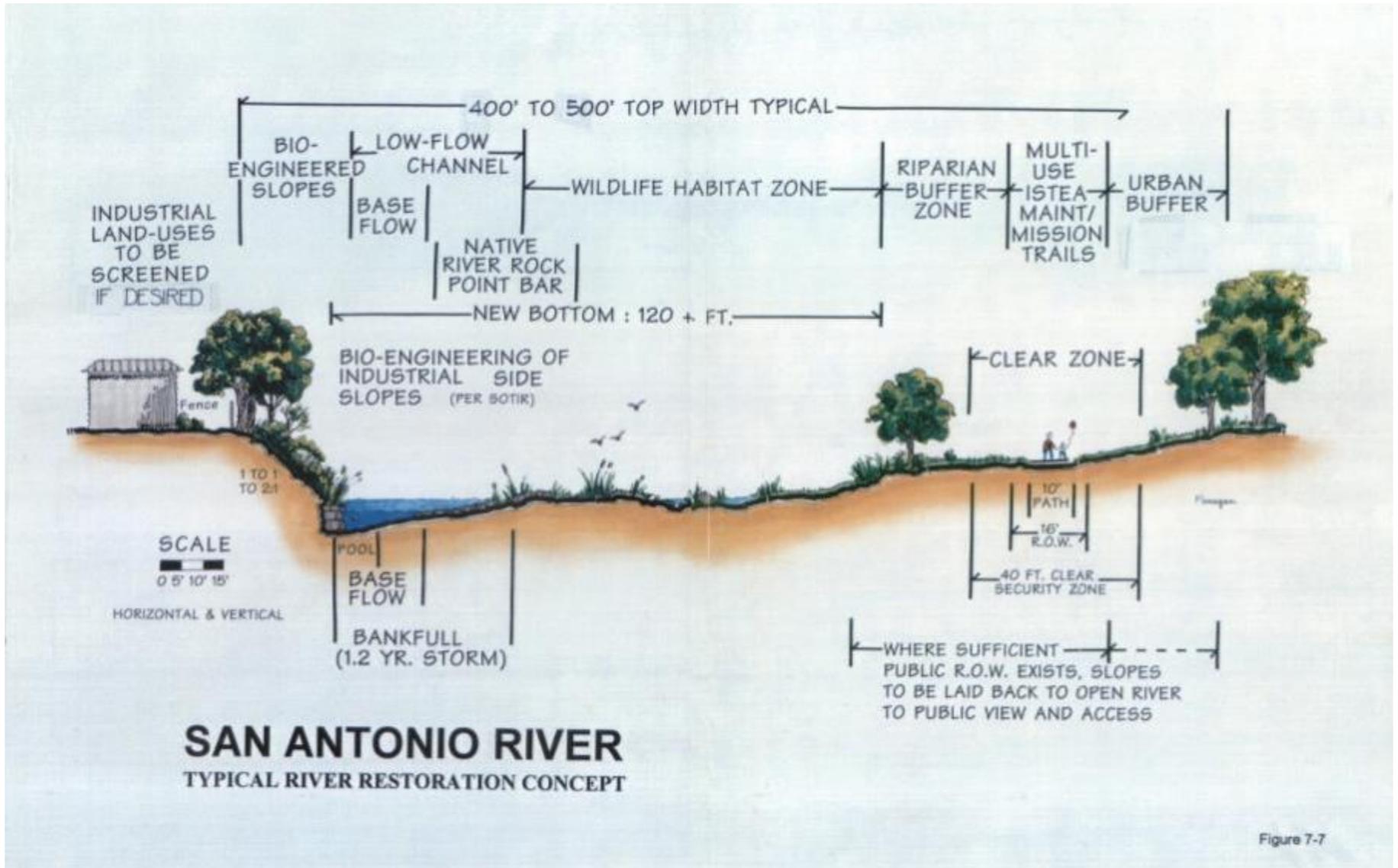


Figure 7-7

San Antonio River Plan



"Natural Bottom" Channel



Creating Multi-Use Places where Families can enjoy Nature

Questions/Discussion

