



# Colorado River Protections

Draft Ordinance Overview  
May 23, 2024





# Presentation Outline

- **Background**

- Council Resolution and Goals
- Colorado River Overview
- Erosion & Water Quality Threats and Costs to Community

- **Draft Ordinance**

- Draft Proposal & Analysis
- Schedule

- **Discussion**





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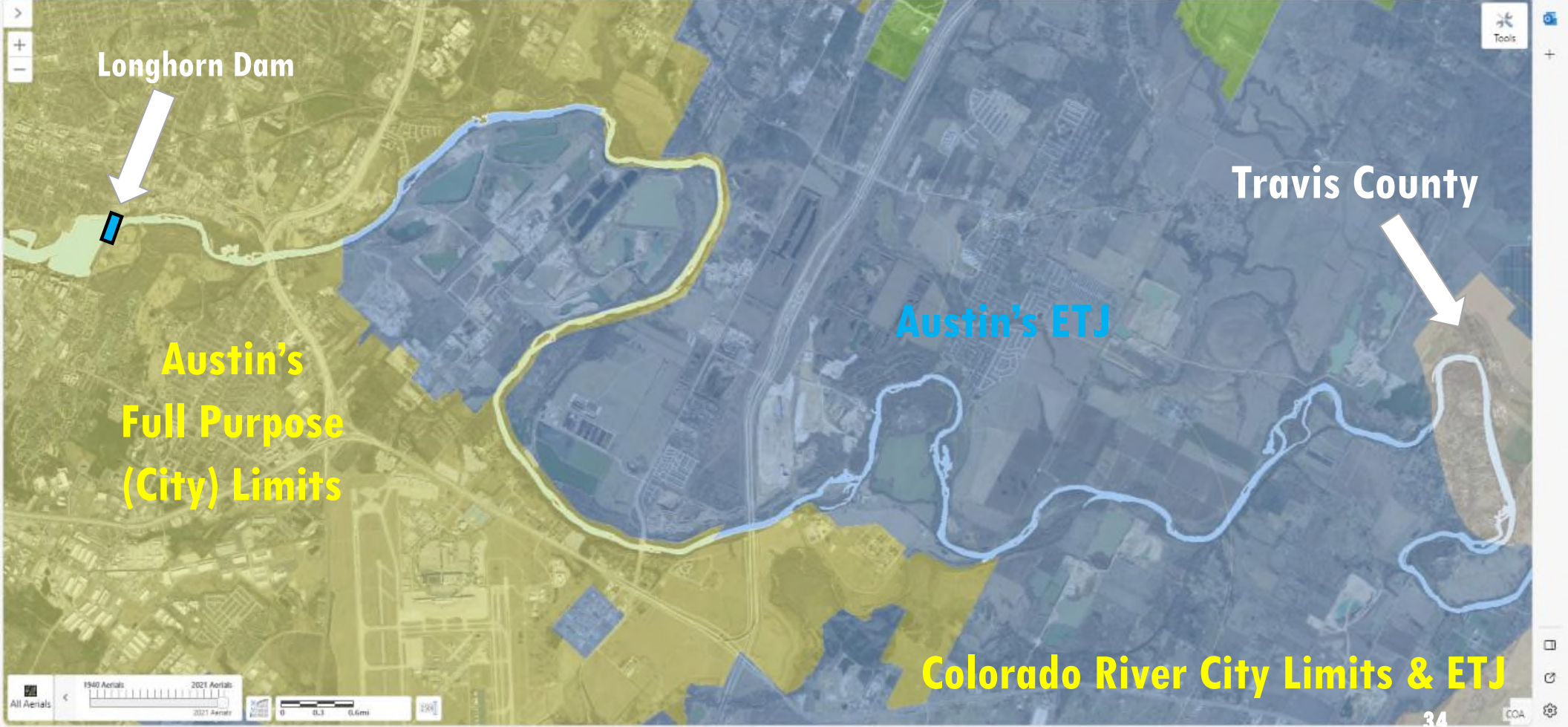




## Council Resolution

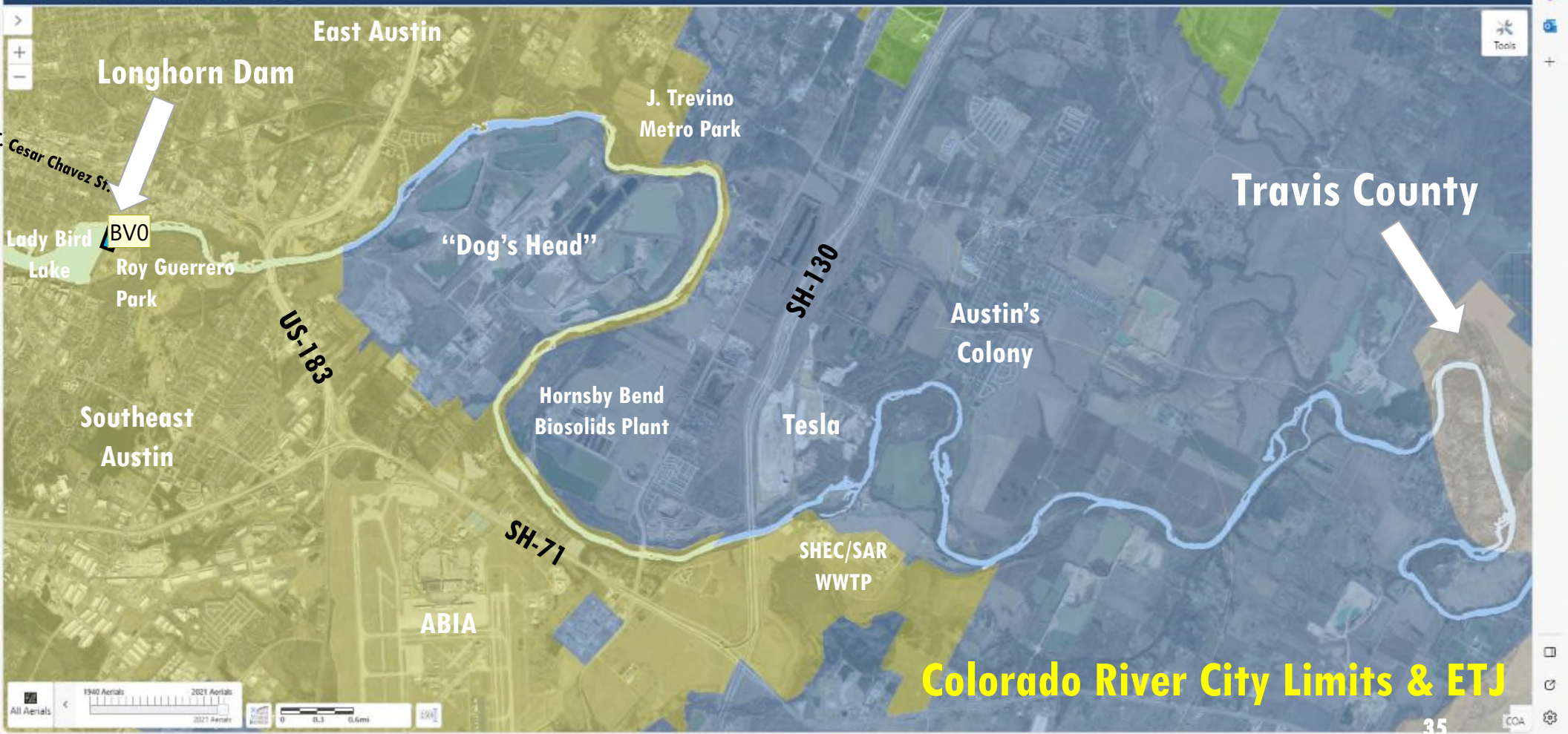
Community members asked Council to strengthen Colorado River protections; Council thereafter included in their [June 2022 Council resolution](#):

**“... evaluate the effectiveness of existing Critical Water Quality Zone and Erosion Hazard Zone buffers on the Colorado River downstream of the Longhorn Dam and to propose protections that will provide adequate protections to the river that will ensure a healthy riparian corridor to stabilize the riverbank and protect property from erosion”**

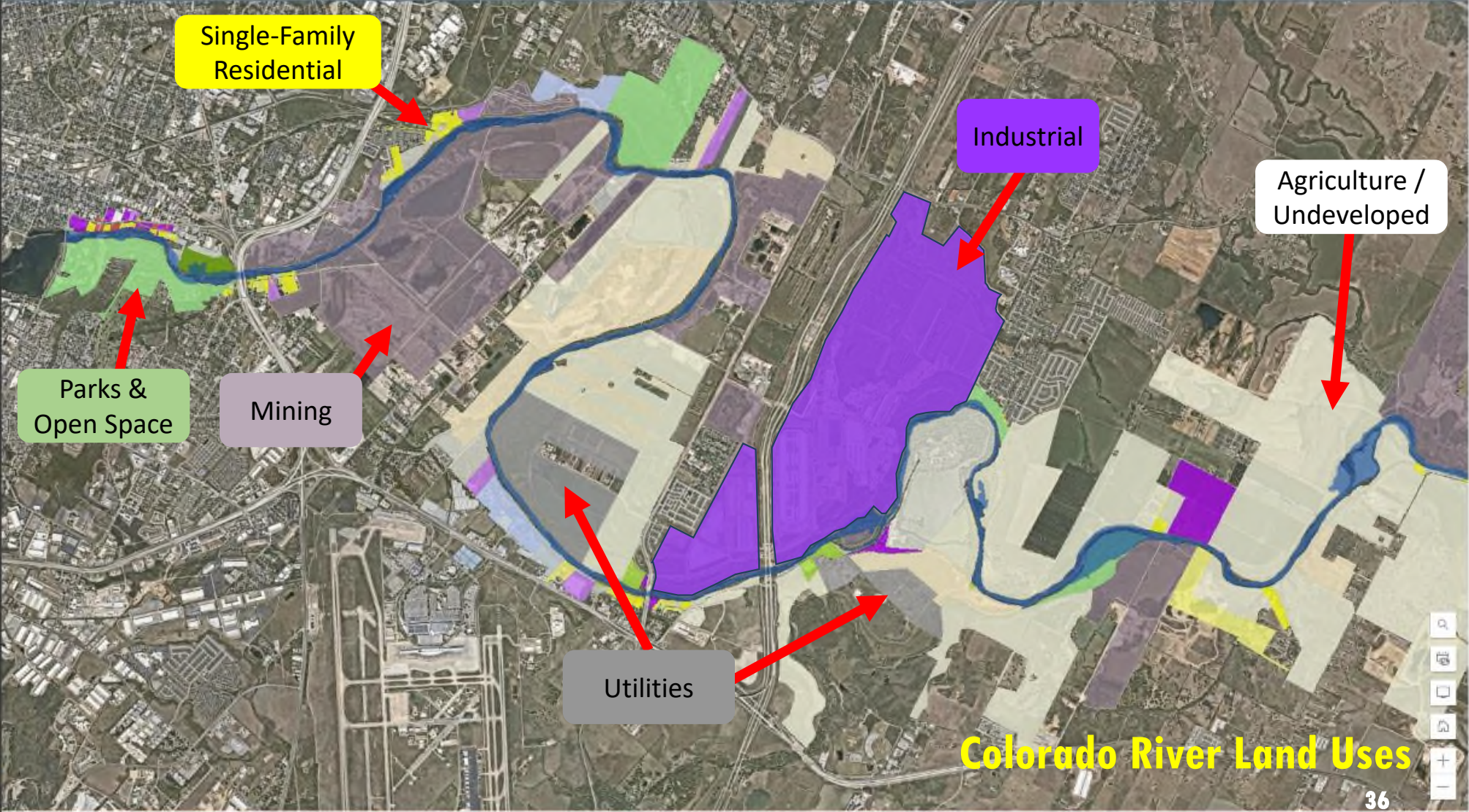


# Property Profile

A DEVELOPMENT SERVICES TOOL



1940 Aerials | 2021 Aerials | All Aerials | 0 0.3 0.6mi



Single-Family Residential

Parks & Open Space

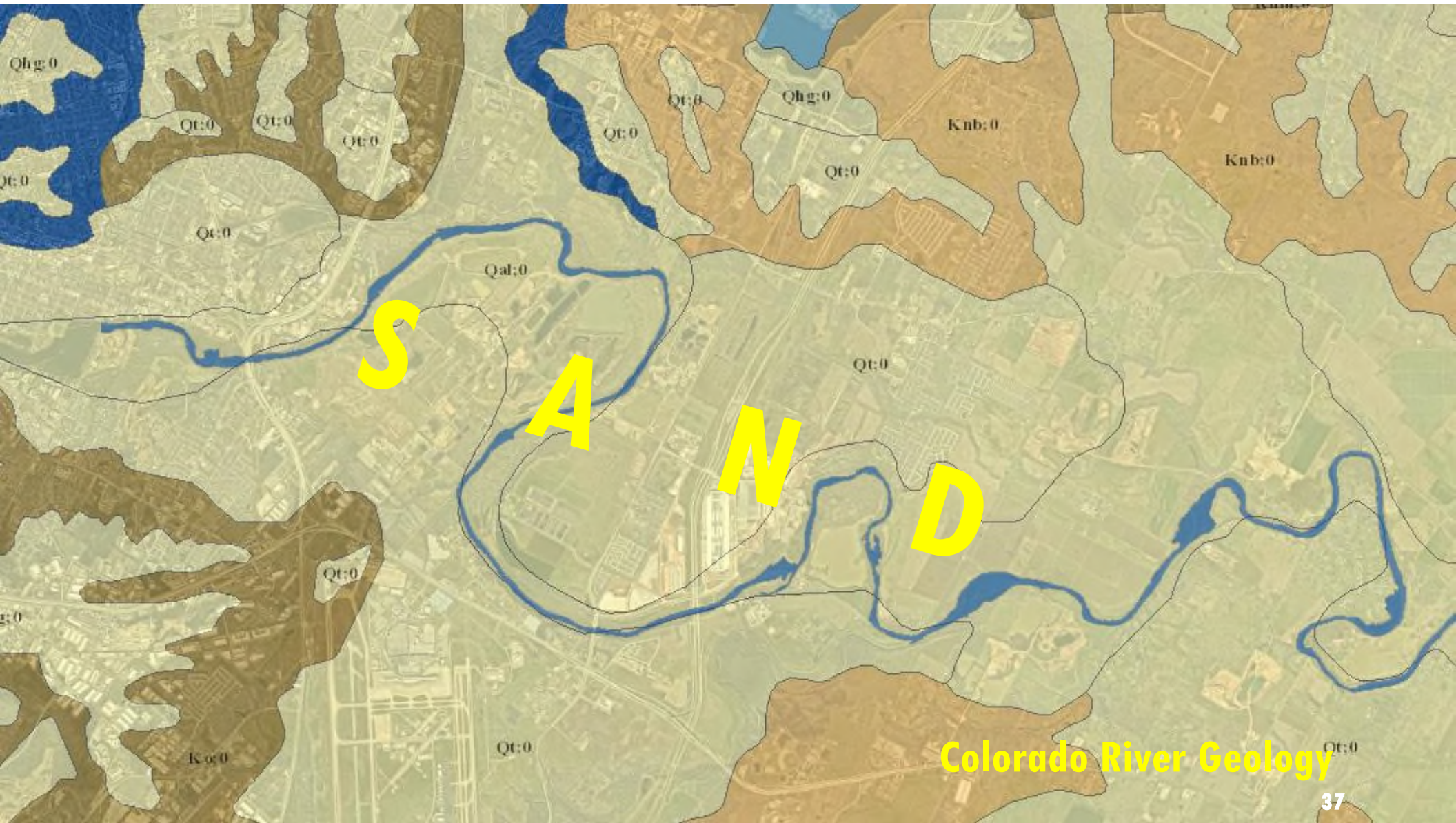
Mining

Utilities

Industrial

Agriculture / Undeveloped

### Colorado River Land Uses



Colorado River Geology





# Erosion Threats

- **Unique, highly erosive alluvial soils**
- **River massively larger than creeks**
- **Seeing major erosion problems**
  - Erosion Hazard Zone (EHZ) code requirements designed for creeks
- **Tens of millions of dollars in damage and counting...**



**\$1.9M Tillery St. Outfall Repair**



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**Fallwell Lane: \$11.4M needed to stabilize bank**



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**Home threatened after bank failure, May 2015**



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**Roy Guerrero Park: Original pedestrian bridge**



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**Roy Guerrero Park: Bridge destroyed**



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**Roy Guerrero Park: \$23M+ project to repair**



## Austin's Colony Phase 2: No Stable Channel

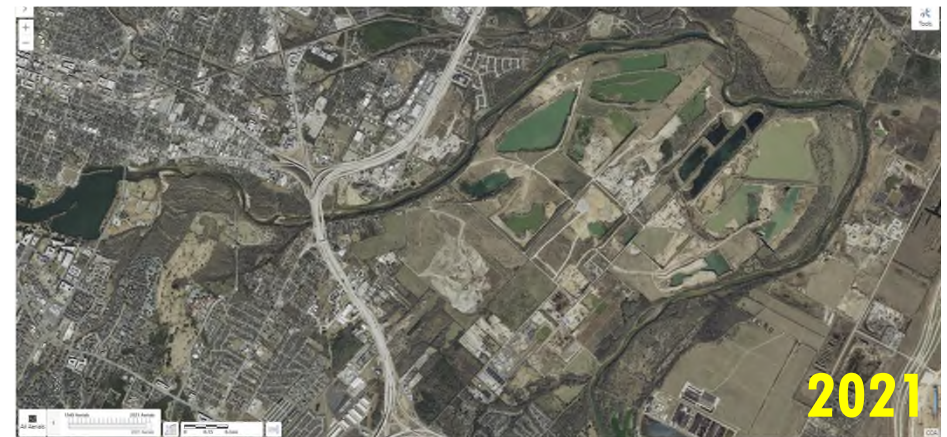






# Water Quality Threats, Historical Context

- Riparian zone long compromised
- Initial transformation by agriculture
- Then by sand and gravel mining
- And by upstream Highland Lakes dams altering flow and sediment regimes
- River water quality primarily affected by upstream flows; secondarily by large creek tributaries
- Direct drainage (buffers) less influential

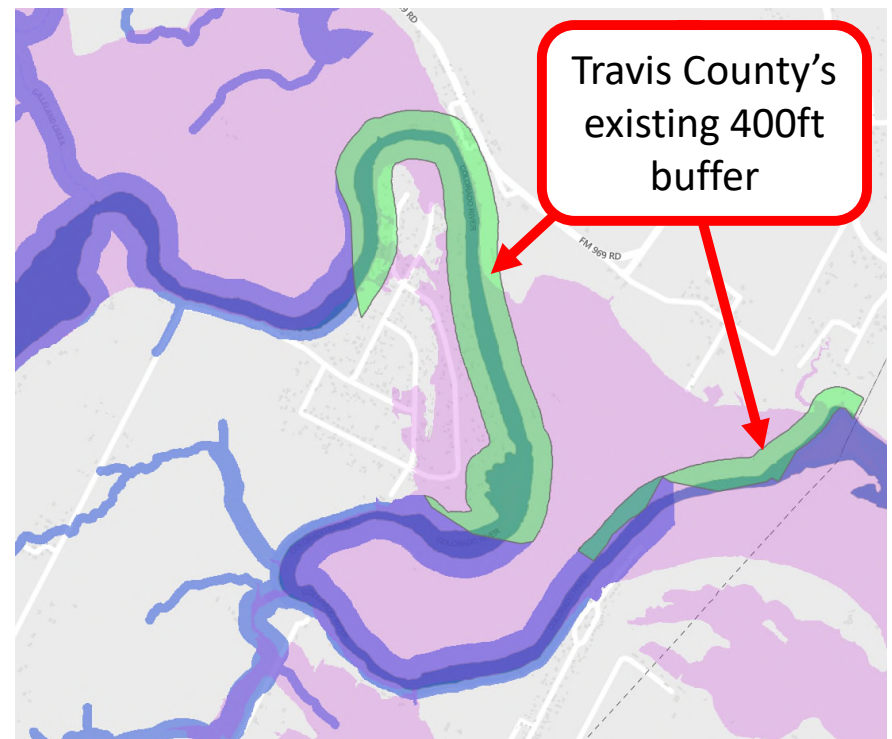




# Water Quality Threats & Historical Context

- 200-400ft Critical Water Quality Zone buffer in 1986\*
- Buffer improved by 2008 ordinance to ensure full expected buffer width
- Buffer remained unchanged with the 2013 Watershed Protection Ordinance
- Current buffer narrower than 400ft Travis County river and City of Austin Barton buffers

\* By the 1986 Comprehensive Watershed Ordinance (CWO)





# Draft Ordinance Proposal

## Recommended

- 1 200ft Erosion Hazard Zone (EHZ) buffer
- 2 New technical specifications for stormwater discharges to the river

## Evaluated but Not Recommended

- 3 400ft Critical Water Quality Zone (CWQZ) buffer

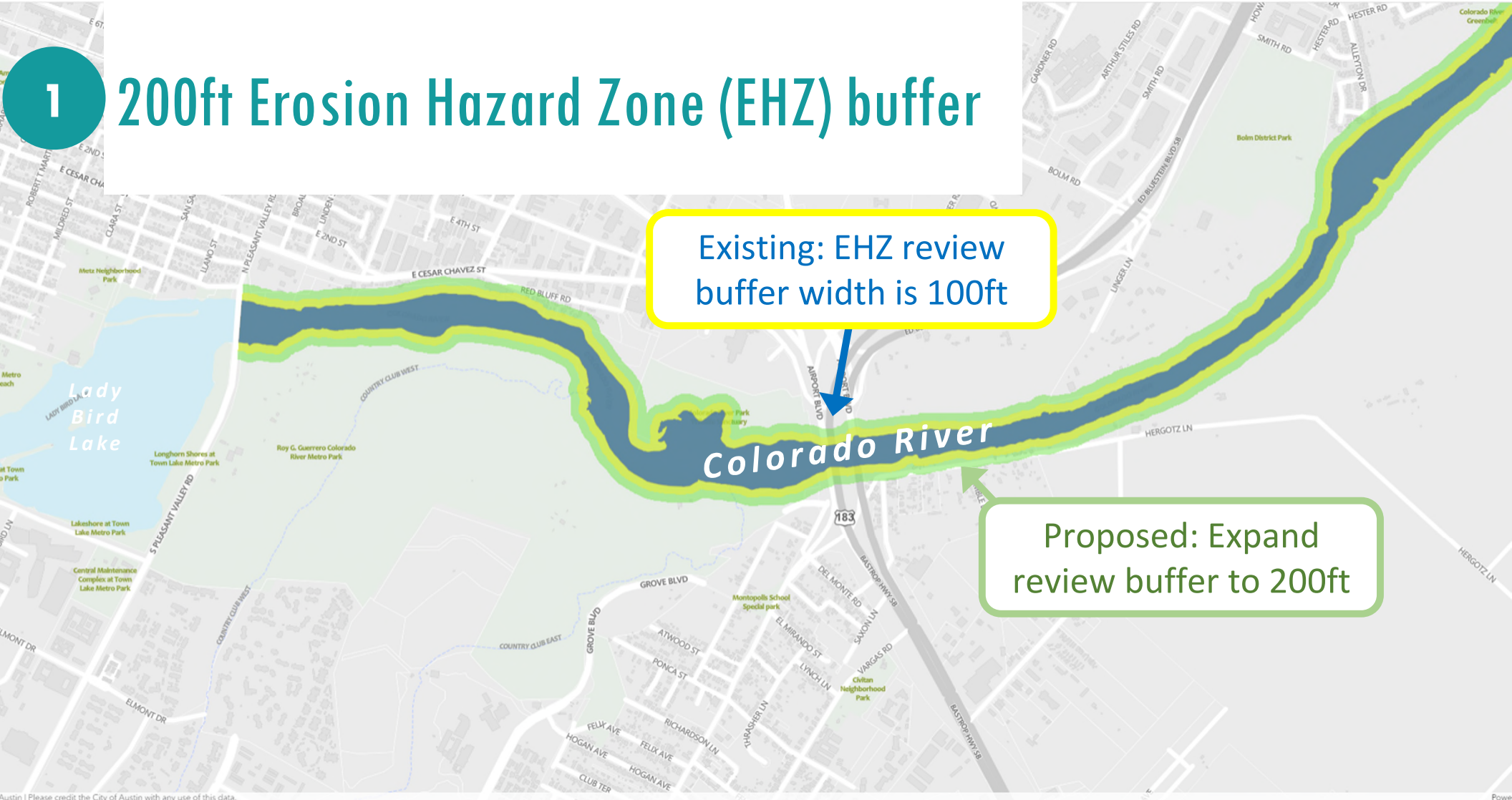
1

# 200ft Erosion Hazard Zone (EHZ) buffer

Existing: EHZ review buffer width is 100ft

**Erosion Hazard Zones:** Regulatory protection to ensure that new buildings and infrastructure built near waterways are located at a safe distance and/or designed with protective works to help prevent future damage to these resources from creek and river erosion.

# 1 200ft Erosion Hazard Zone (EHZ) buffer



Existing: EHZ review buffer width is 100ft

Proposed: Expand review buffer to 200ft

Austin | Please credit the City of Austin with any use of this data.



# Proposal: Erosion Protections

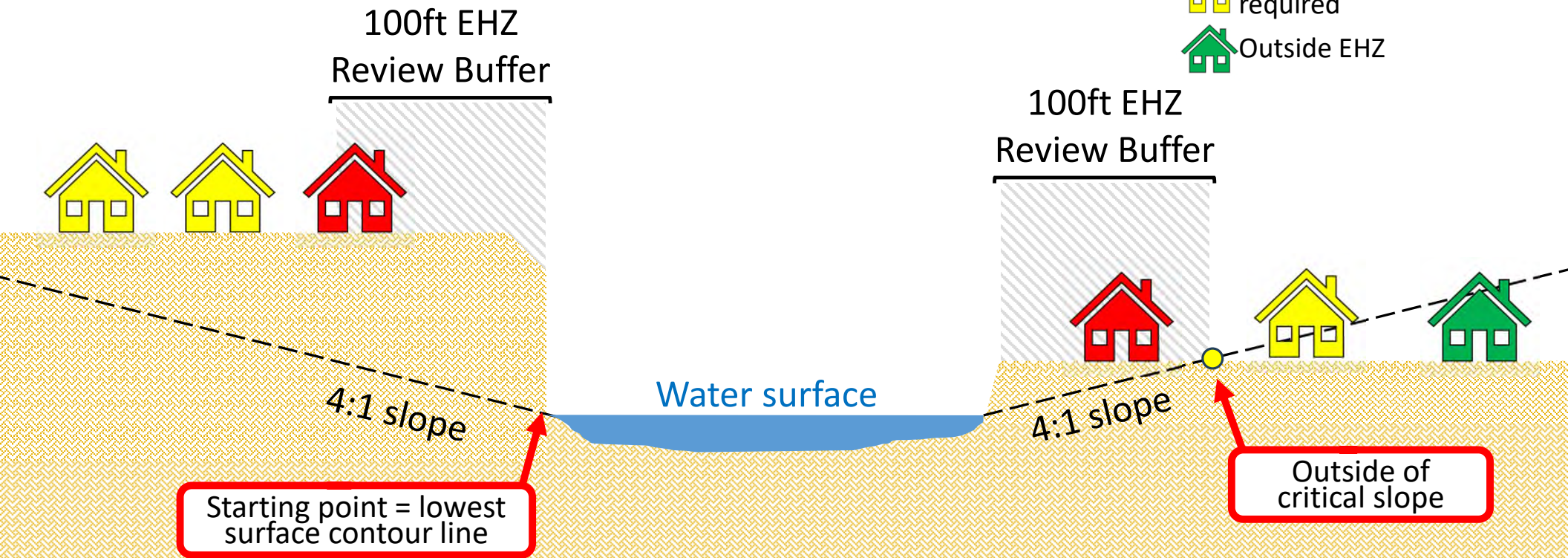
## 1 200ft Erosion Hazard Zone (EHZ) review buffer

- Expanded from current 100ft review buffer width
- EHZ-Level 1 envelope goes from “toe” of river inland at a 4:1 angle
  - Typical bank height of 50ft x 4:1 angle = 200ft recommended review buffer width
  - Toe starts at the Water surface contour (from [Property Profile](#))
- Must show “protective works” if build within EHZ-Level 1 envelope
- Applies only to “habitable space” and infrastructure (not driveways, decks, etc.)
- Does not extend beyond parallel public ROWs
- 20ft depth below river bottom for underground utility crossings
- More detailed “Level 2” options also available



# Level 1 EHZ Diagram: Existing

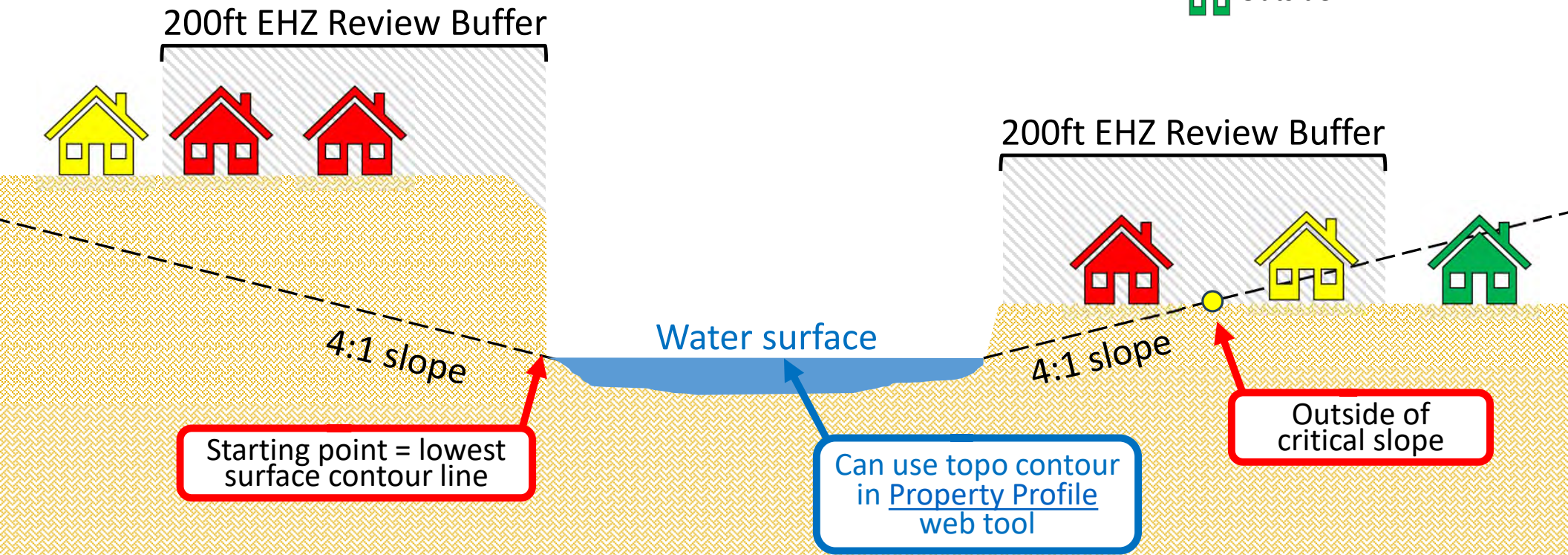
- Protective works or Engineer Level II required
- Protective works not required
- Outside EHZ





# Level 1 EHZ Diagram: Proposed

- Protective works or Engineer Level II required
- Protective works not required
- Outside EHZ

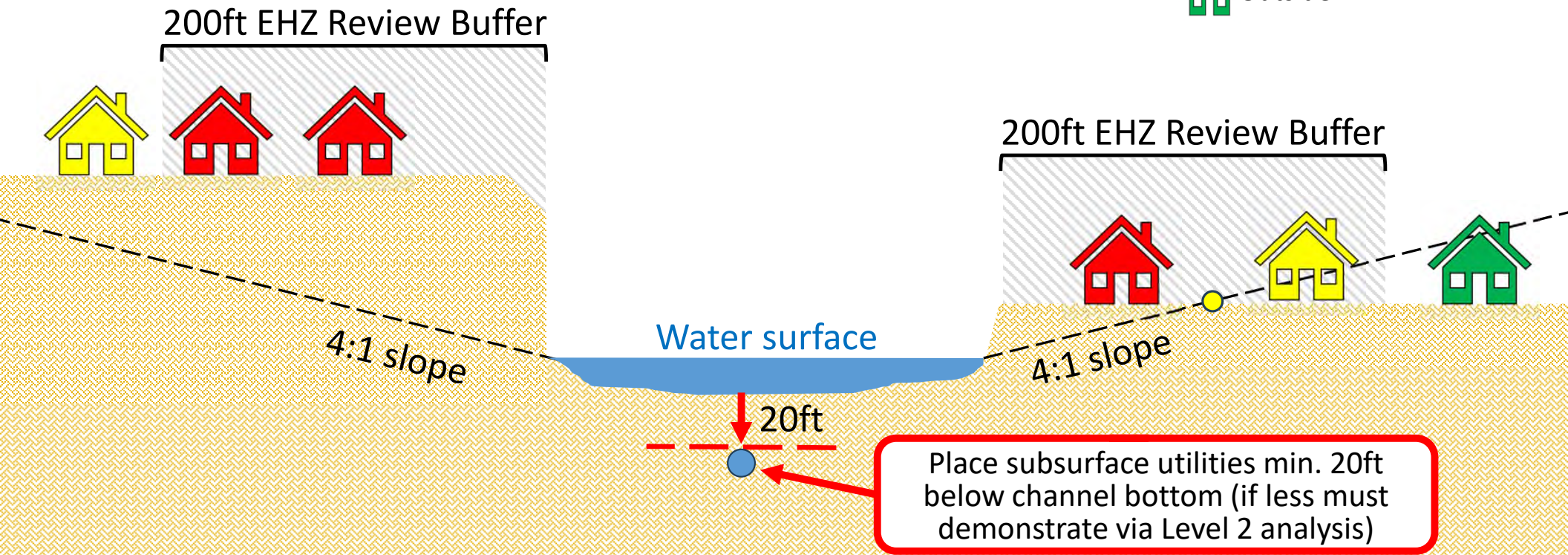






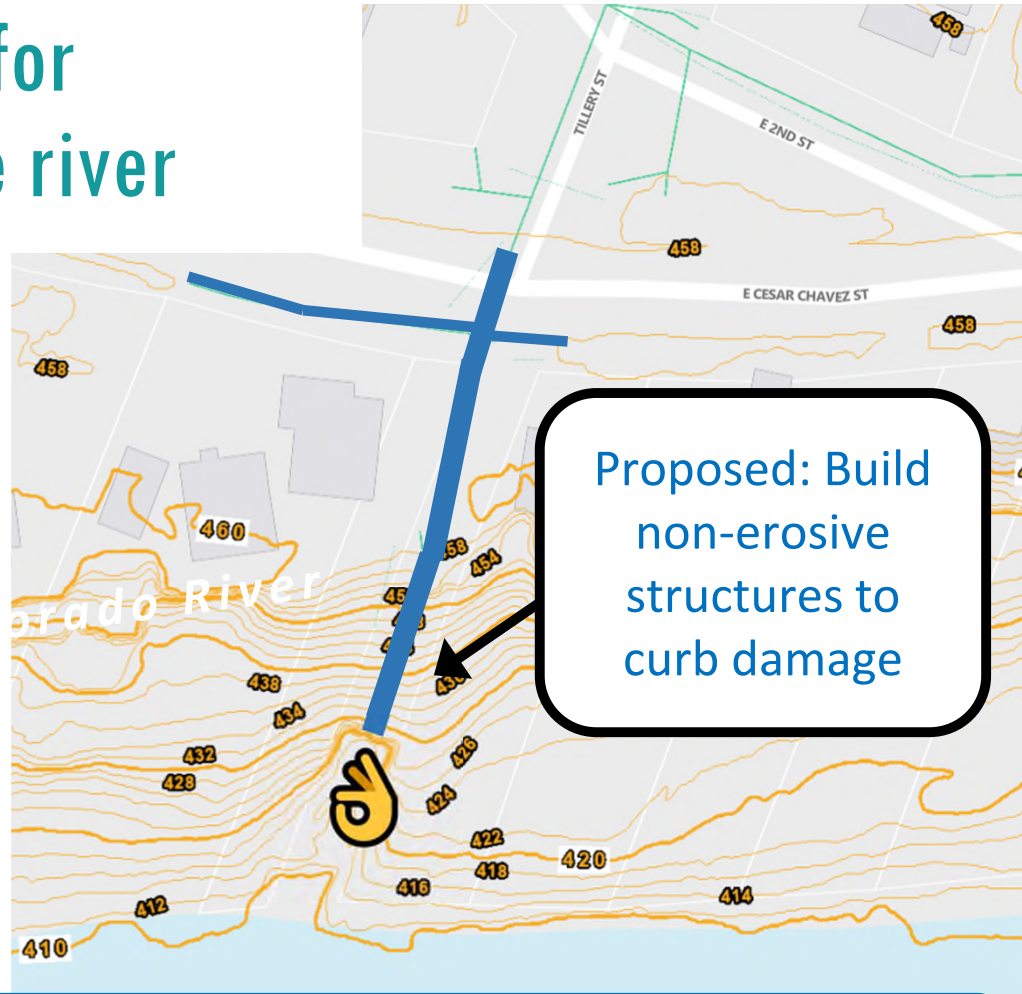
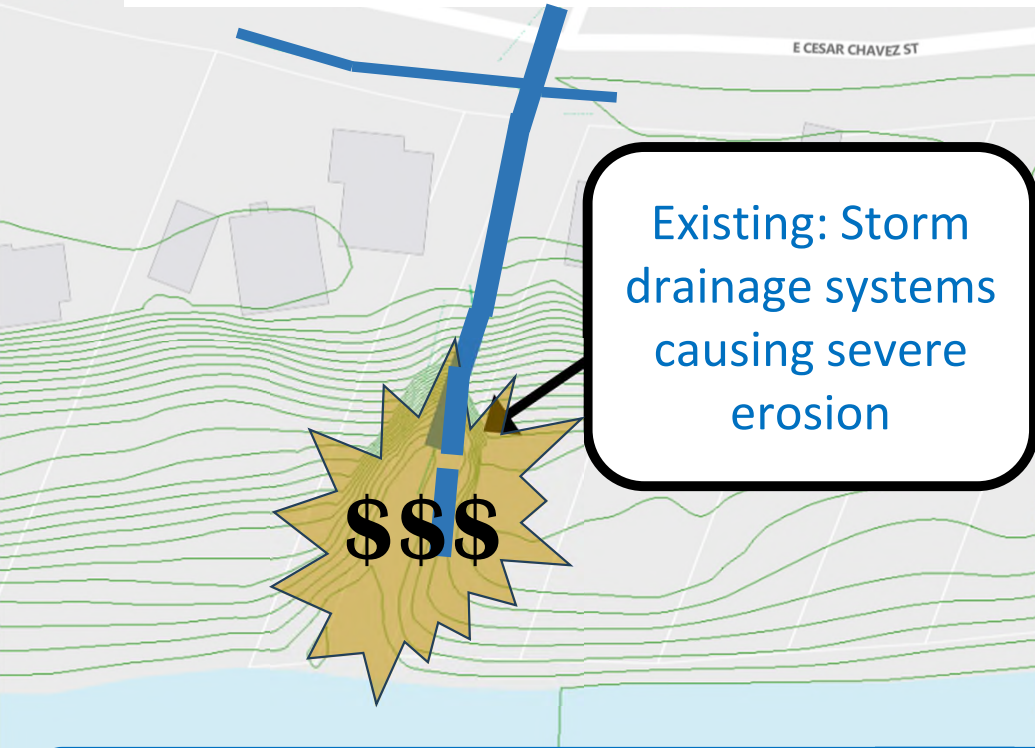
# Level 1 EHZ Diagram: Proposed

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2

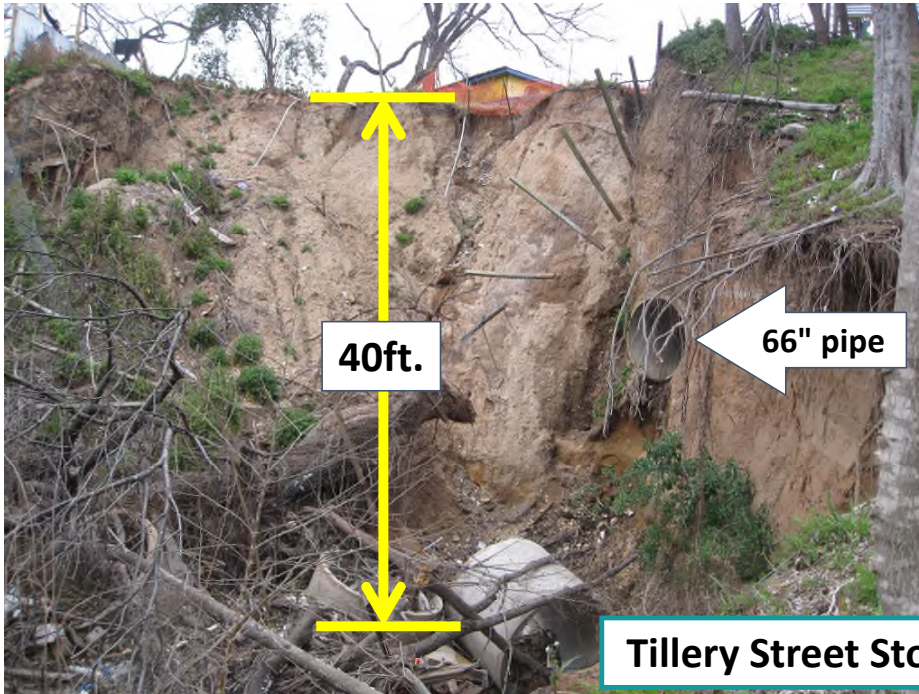
## New technical specifications for stormwater discharges to the river



**Armored stormwater discharge infrastructure:** engineering solutions designed to reduce the erosive energy from stormwater flows from developed areas to reduce erosion and related property damage and loss.

# Proposal: Non-Erosive Stormwater Discharges

## 2 New technical criteria and specifications for outfalls to river



**Tillery Street Storm Drain Outfall Repair**

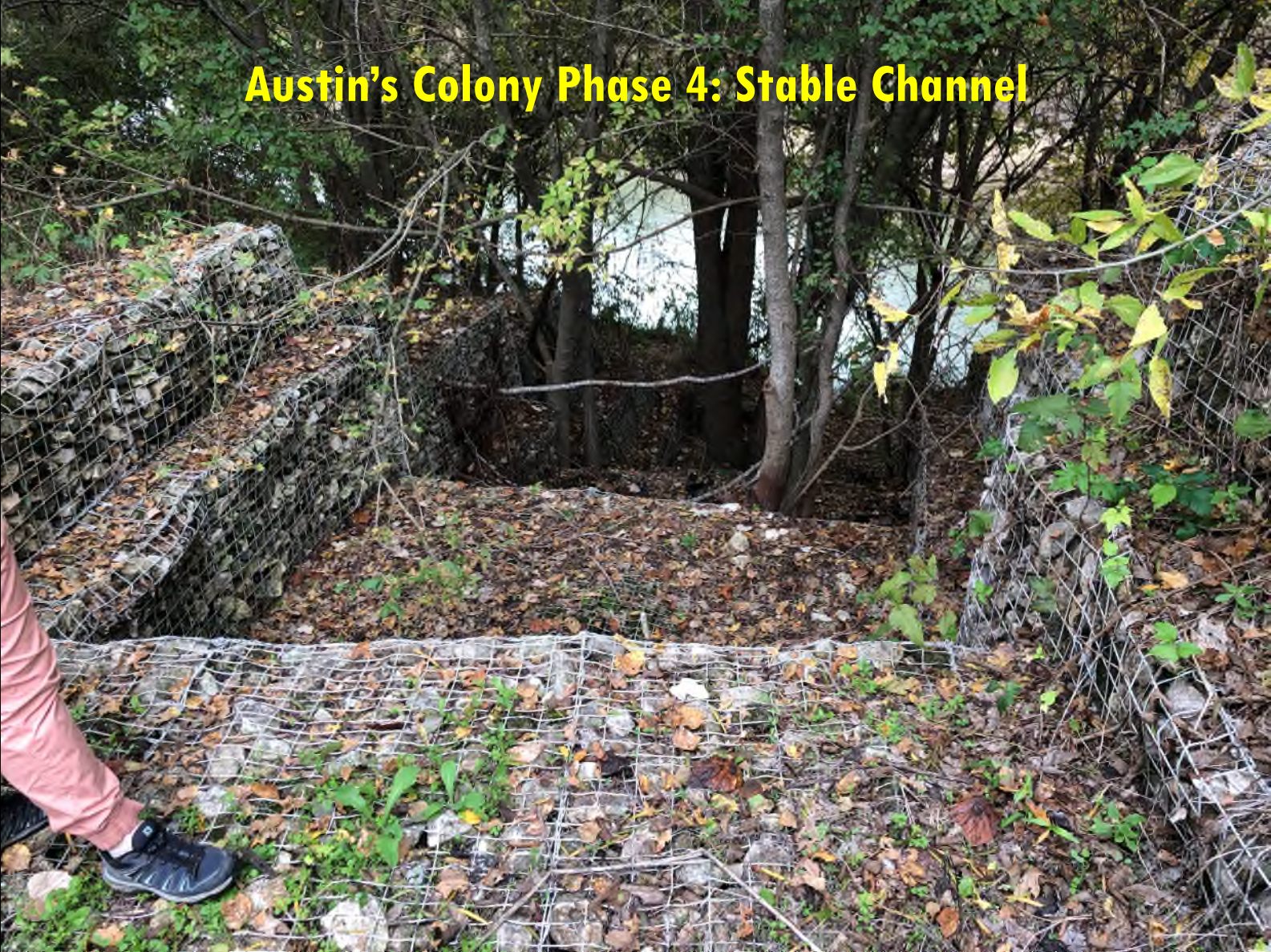
## Austin's Colony Phase 2: No Stable Channel



## Austin's Colony Phase 4: Stable Channel

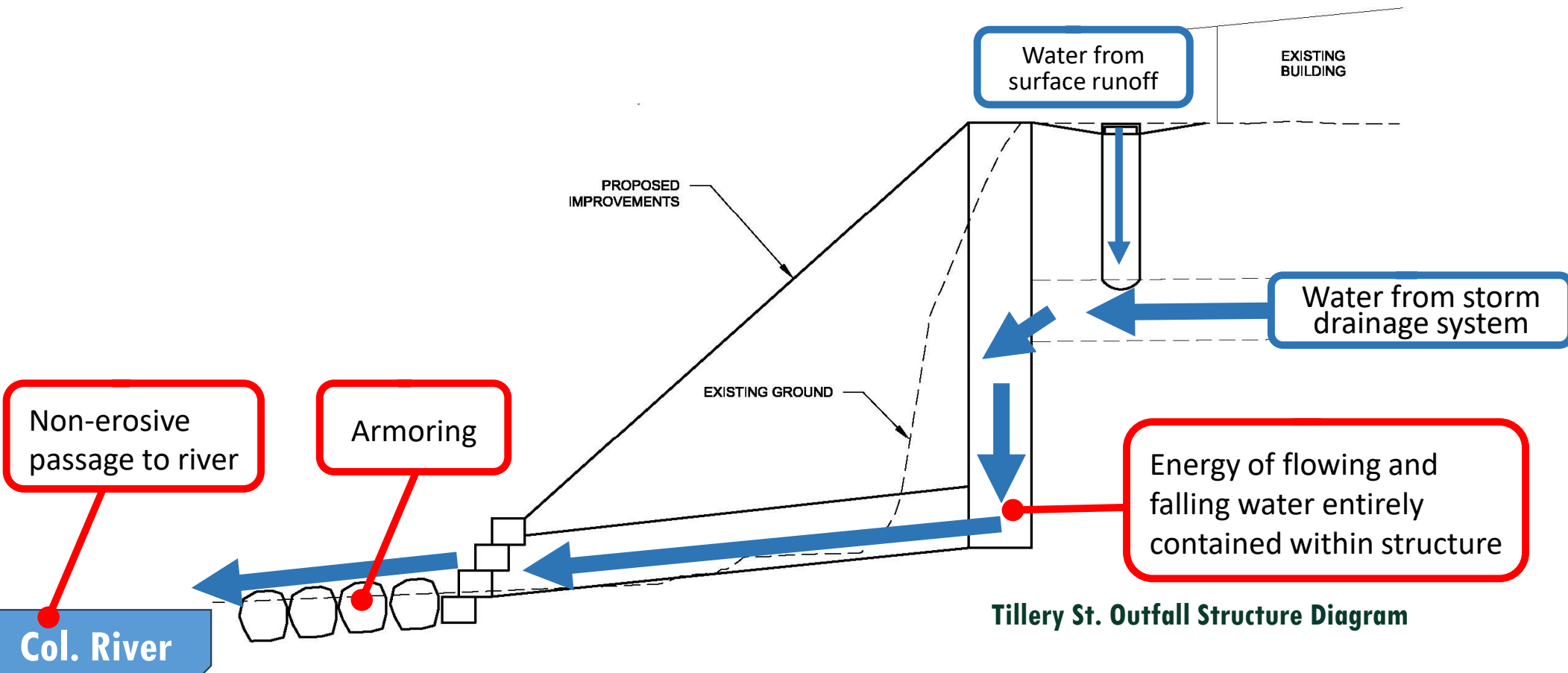


## Austin's Colony Phase 4: Stable Channel





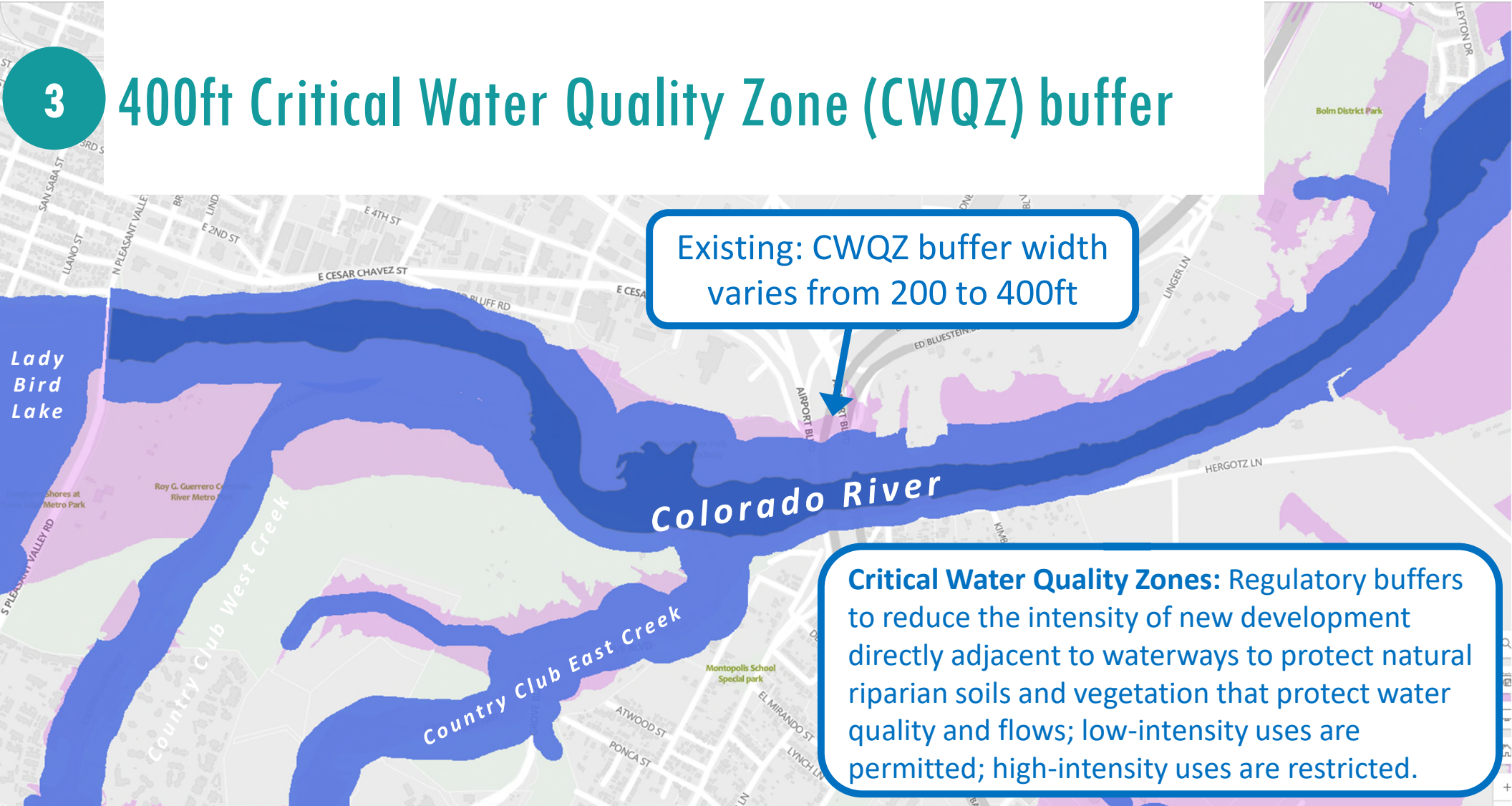
# Example Drop Structure for Outfall



Tillery St. Outfall Structure Diagram

3

## 400ft Critical Water Quality Zone (CWQZ) buffer



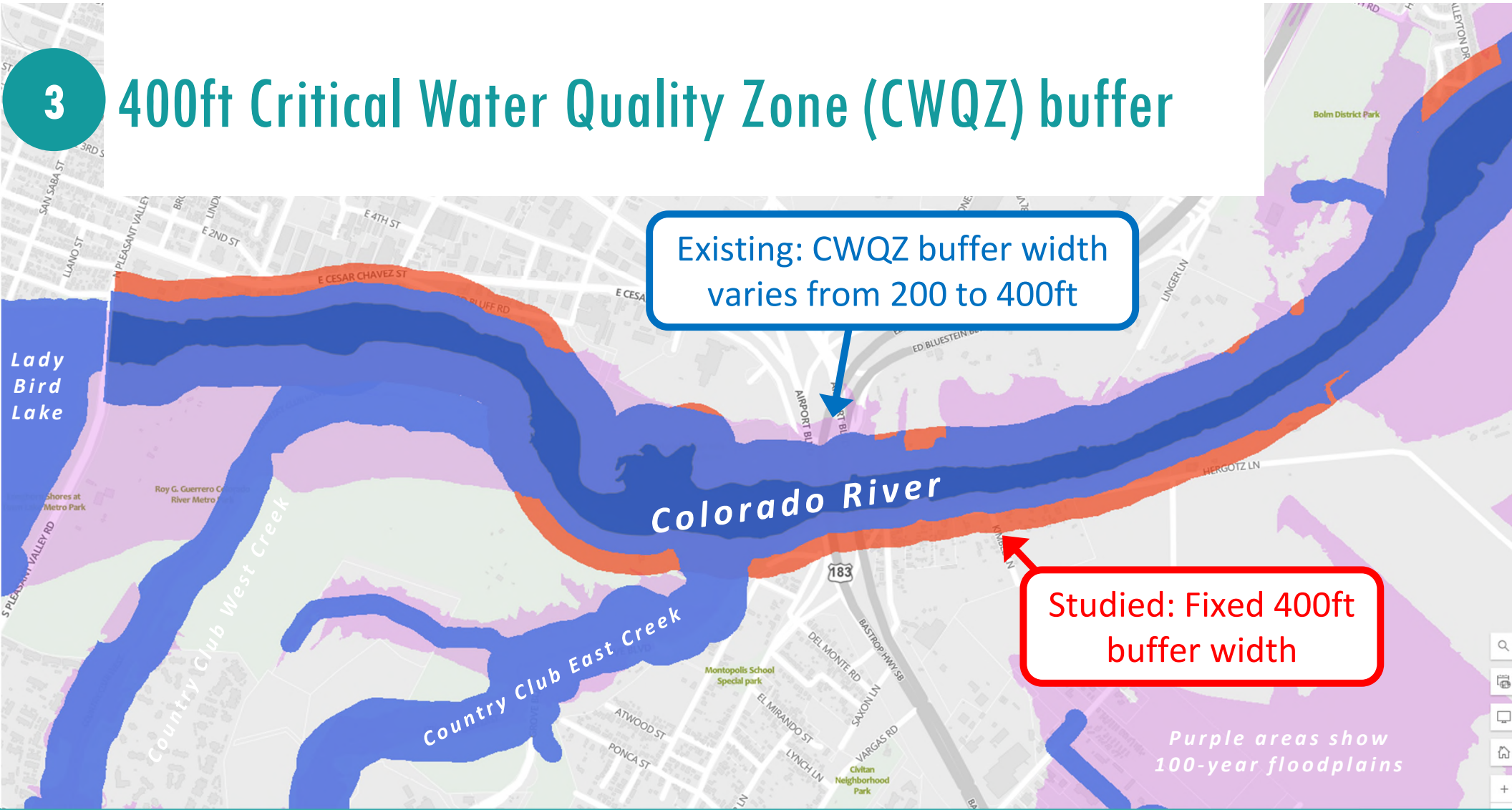
Existing: CWQZ buffer width varies from 200 to 400ft

**Critical Water Quality Zones:** Regulatory buffers to reduce the intensity of new development directly adjacent to waterways to protect natural riparian soils and vegetation that protect water quality and flows; low-intensity uses are permitted; high-intensity uses are restricted.



3

# 400ft Critical Water Quality Zone (CWQZ) buffer





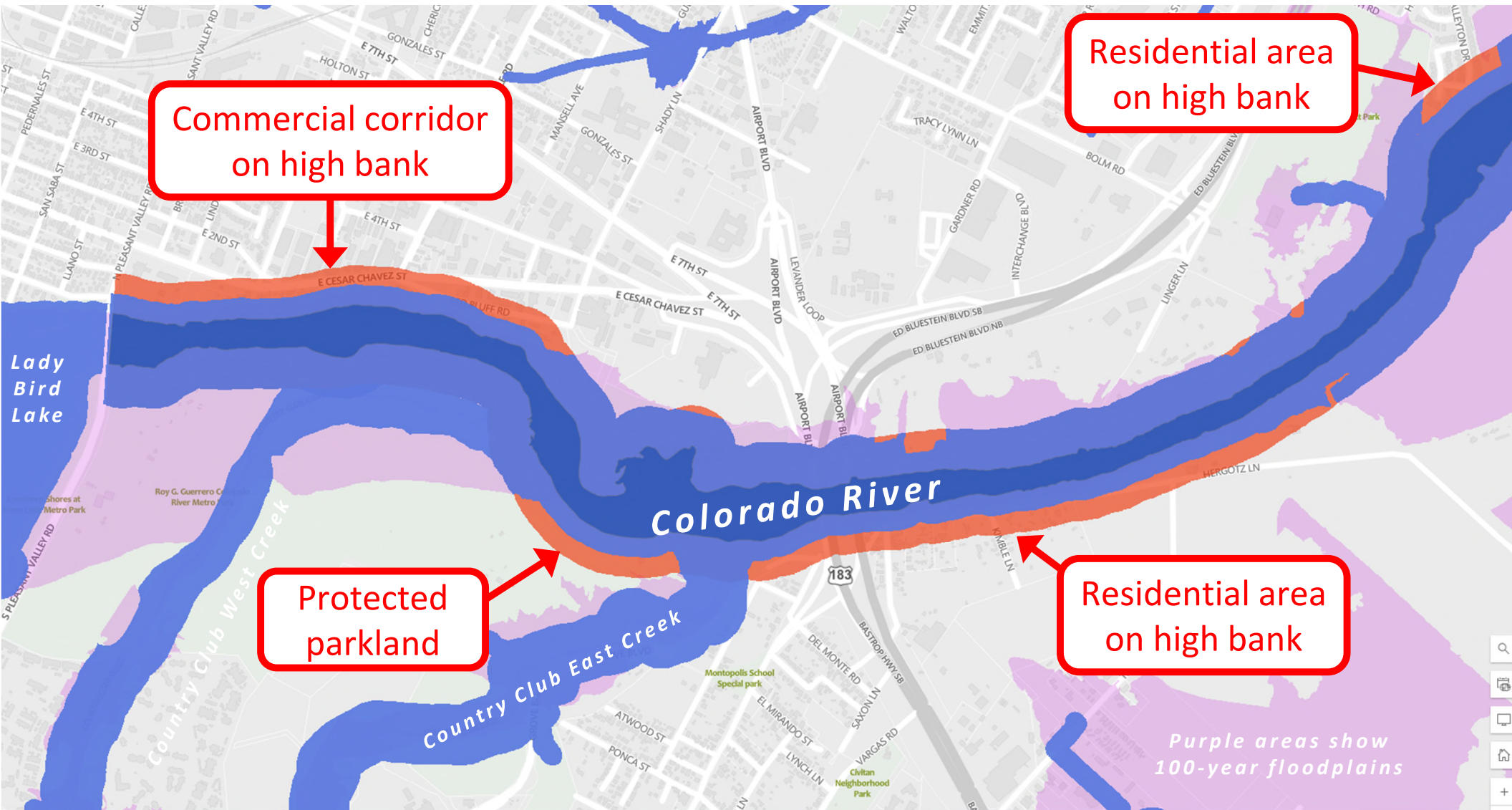
## Studied: Fixed-Width River Buffers

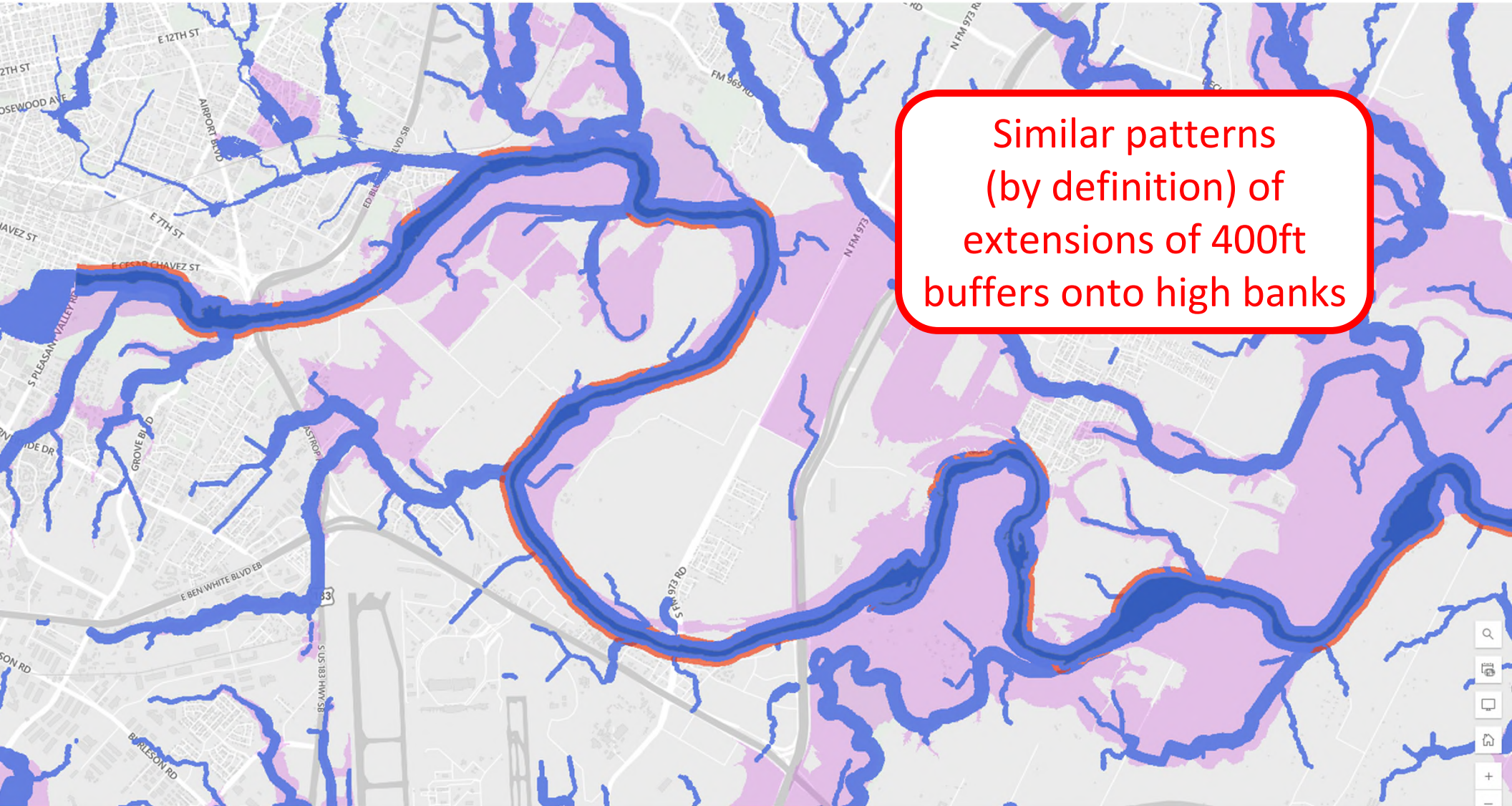
### 3 400ft Critical Water Quality Zone (CWQZ) buffer

- Expanded from current 200-400ft width
- May use “buffer averaging” (min. width 200ft)
- May retain developable area via Redevelopment Exception and Gross Site Area
- Matches Travis County’s 400ft width (and that of Barton Creek mainstem)

**\*\*\* NOT RECOMMENDED \*\*\***

**Existing buffers provide good protection, best fit the terrain**





Similar patterns  
(by definition) of  
extensions of 400ft  
buffers onto high banks



## Overview of Staff Ordinance Proposal

### 1. 200ft Erosion Hazard Zone (EHZ) review buffer

- **RECOMMENDED**
- **More accurate recognition of erosion risk**
- **Most properties along river not impacted**

### 2. New technical specifications for stormwater discharges to river

- **RECOMMENDED**
- **Low-cost solution relative to much higher damage/costs**

### 3. 400ft Critical Water Quality Zone (CWQZ) buffer

- **NOT RECOMMENDED**
- **High impact on some properties; high banks not where protection needed; water quality protection more in upstream flows and larger tributaries**



# Schedule

## Spring/Summer 2024

- **Finalize draft staff recommendation**

## Summer/Fall 2024

- **Stakeholder input**

## Late 2024/Early 2025

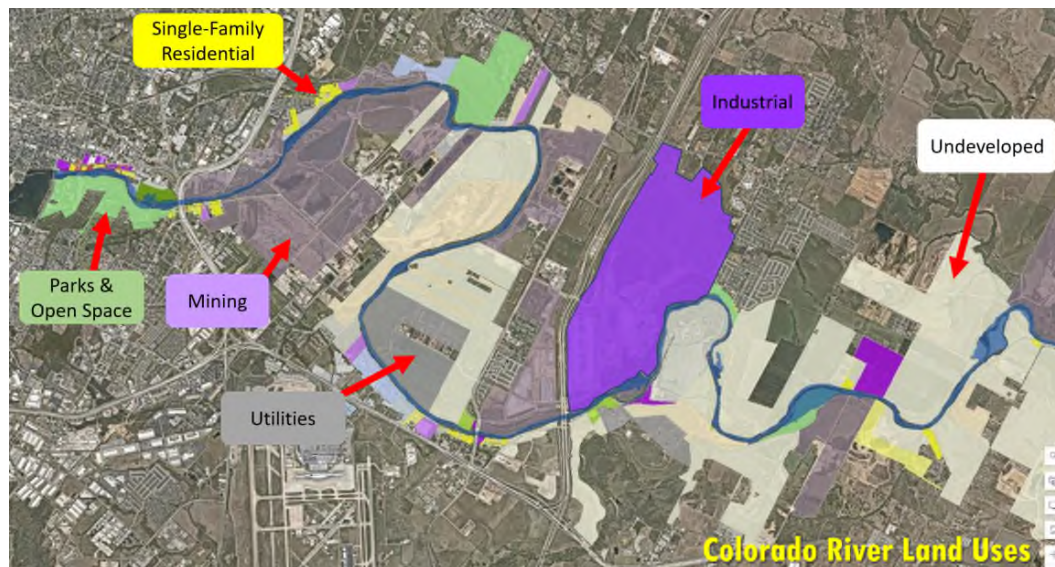
- **Environmental Commission**
- **Planning Commission**
- **City Council**

A scenic view of a pond surrounded by trees with autumn foliage. The word "Discussion" is overlaid in large white text. The pond is calm, reflecting the surrounding trees and sky. The trees have various shades of green, yellow, and orange, indicating the fall season. The sky is overcast with grey clouds. The overall mood is peaceful and natural.

# Discussion



# Analysis

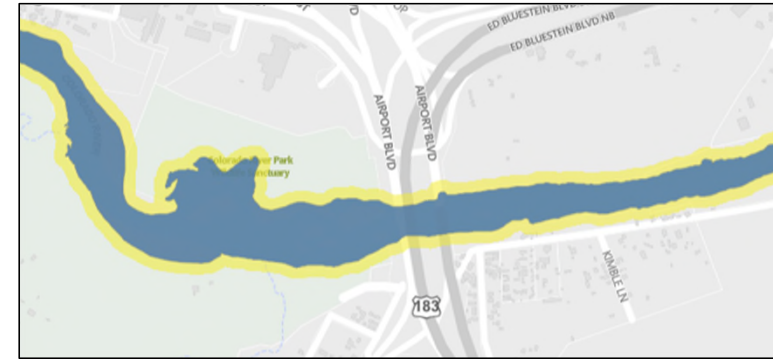


- 484 parcels within the 400ft CWQZ buffer
- Examining the relative impacts on each one by the proposed EHZ and CWQZ changes



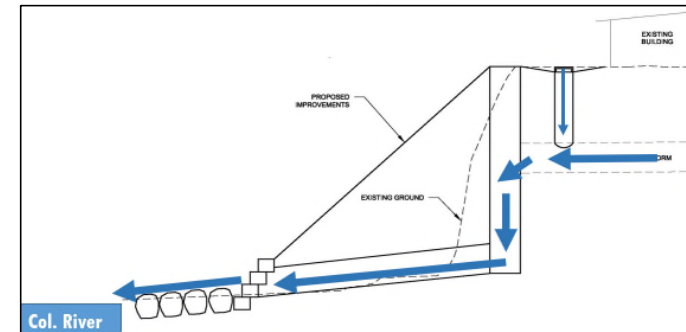
## Analysis: Impact of 200ft EHZ for Buildings and Infrastructure

- **Affects existing single-family residential lots—but most at risk**
  - **36 of 244 such parcels (15%) affected**
  - **Few existing structures in 200ft EHZ**
  - **Estimated 3 to 5 times the standard building foundation cost (which translates to an approximately 8 to 20% additional construction cost)**
- **Less/minimal impact on site plan/ subdivision development (since 200ft already CWQZ min.); infrastructure affected (intentionally)**
- **Only applies to habitable structures; no impact on fences, decks, driveways, etc.; measuring from bank's edge simplifies analysis**



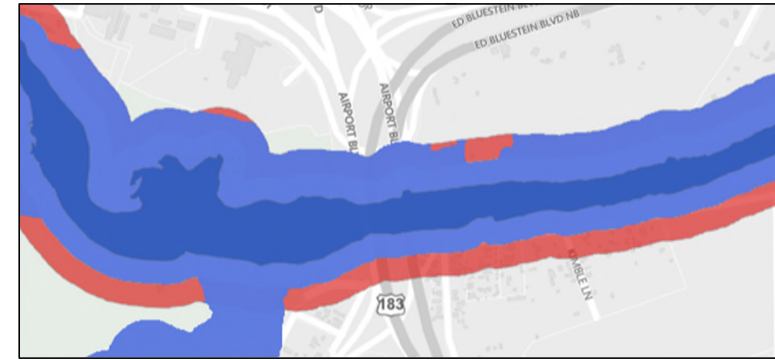
## Analysis: Impact of Requiring Non-Erosive Stormwater Discharges

- Applies to site plan/ subdivision development
  - Studying when/how to apply, e.g., drainage areas larger than xx acres and/or within yy feet of the river's edge
- No impact on individual single-family residential projects
- Familiar technique with many past applications
- Extremely cost-effective: compare cost of armoring and drop structure versus repair and restore damage



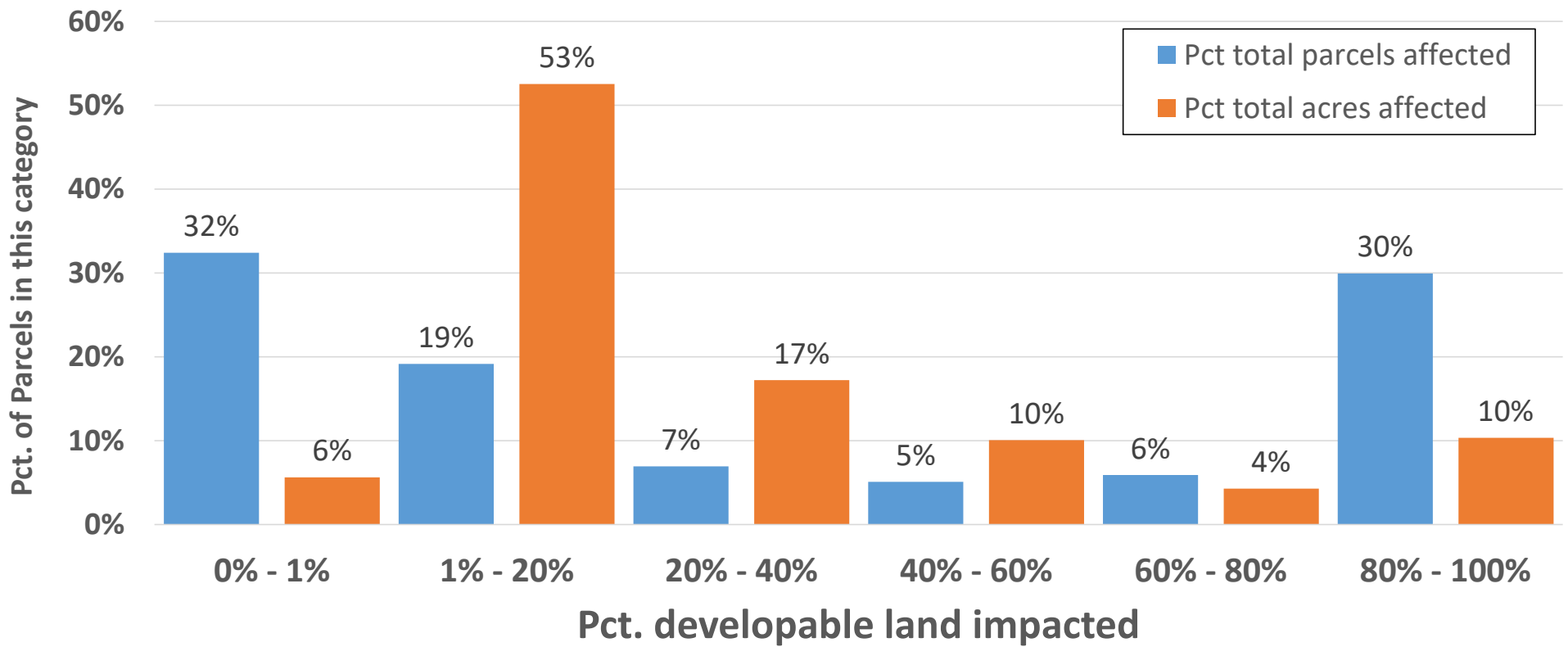
## Analysis: Impact of fixed 400ft Critical Water Quality Zone buffer

- **Affects site plan and subdivision development (not most building permits)**
  - **44 of 240 (18%) affected with an average 2% impact to land area**
  - **Does not affect single-family, duplex, or 3-unit residential construction using a Building Permit on an individual platted lot**
- **Affects parcels that have land 200-400ft off the riverbank that is outside of the 100yr floodplain (typically on a “high bank” of the river)**
- **Ability to use the Redevelopment Exception could reduce impact on many parcels with existing development (impervious cover)**
- **“Buffer averaging” and “gross site area” code provisions could reduce impacts to many new developments**

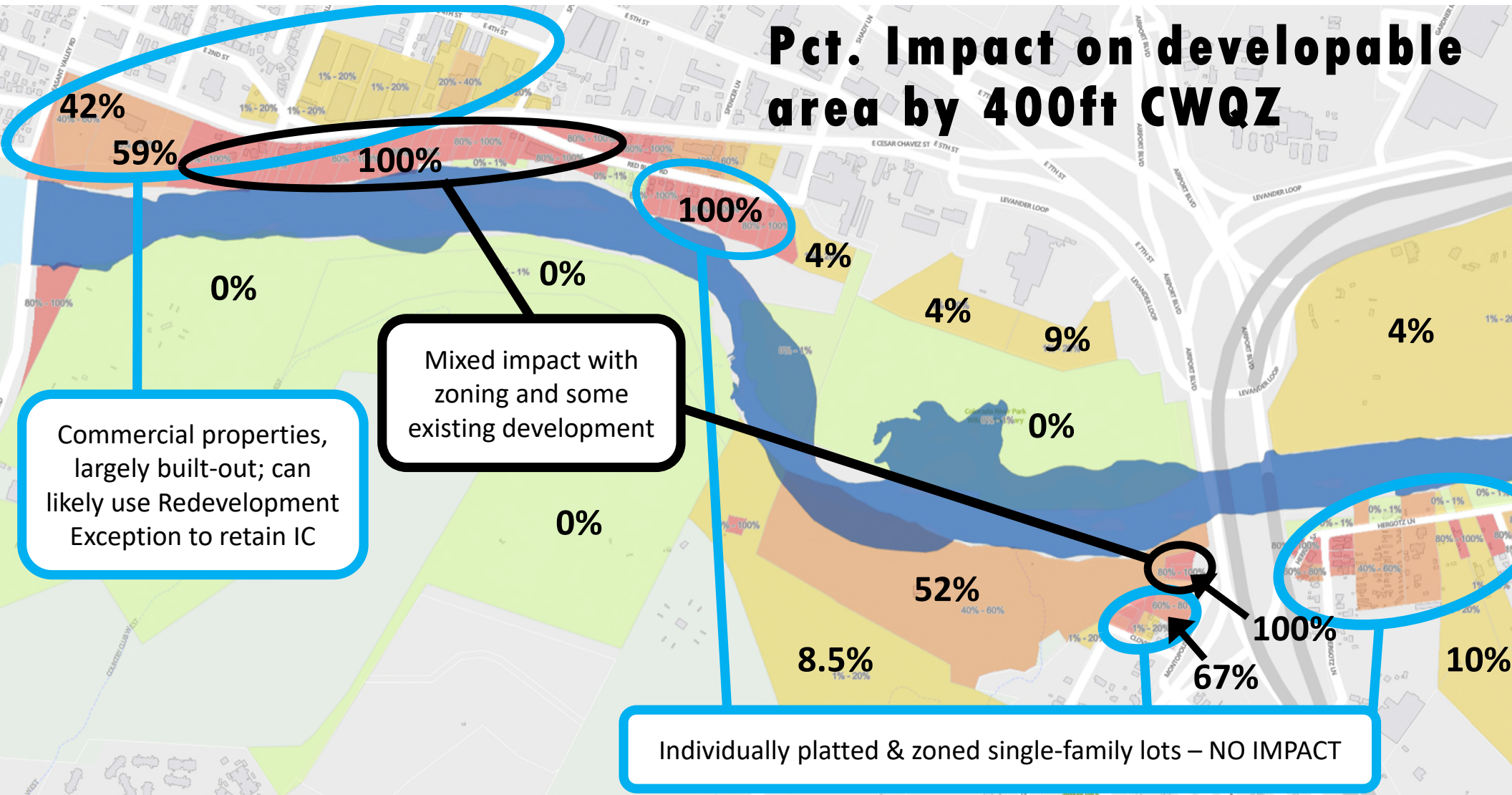




# Parcel Count and Land Area Affected by 400ft Fixed CWQZ



# Pct. Impact on developable area by 400ft CWQZ





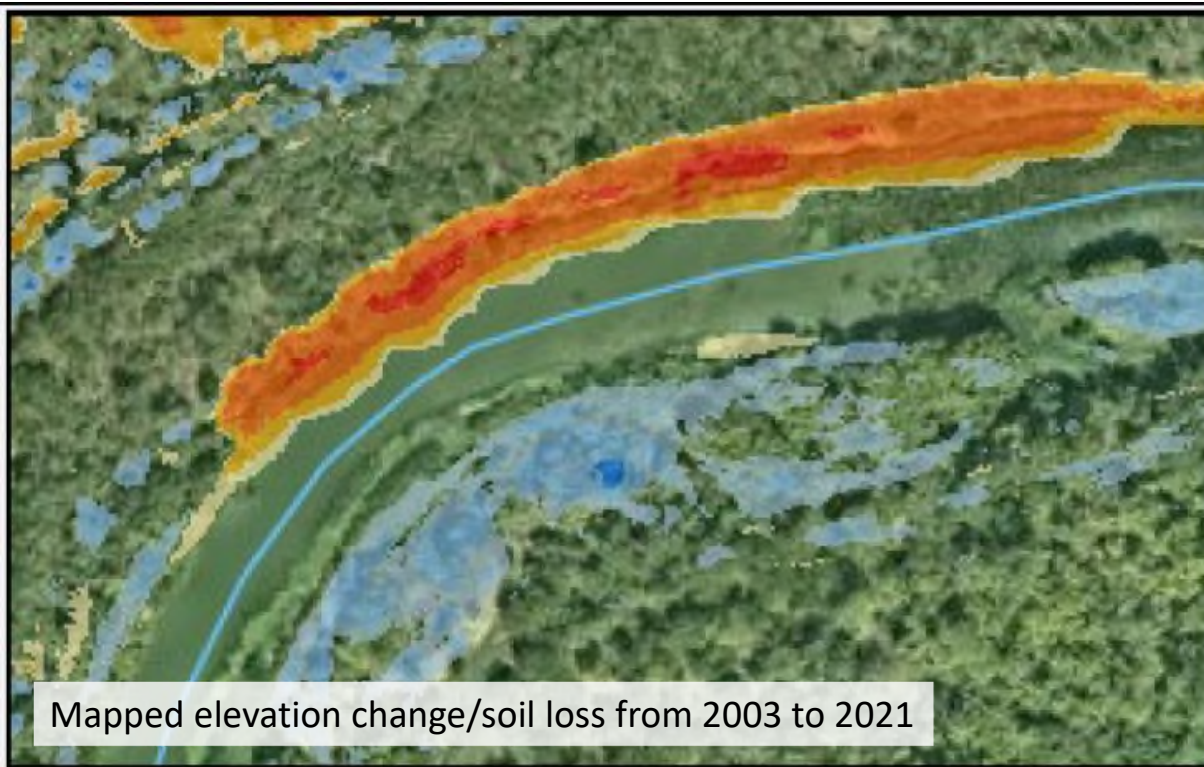
# Bank height estimates



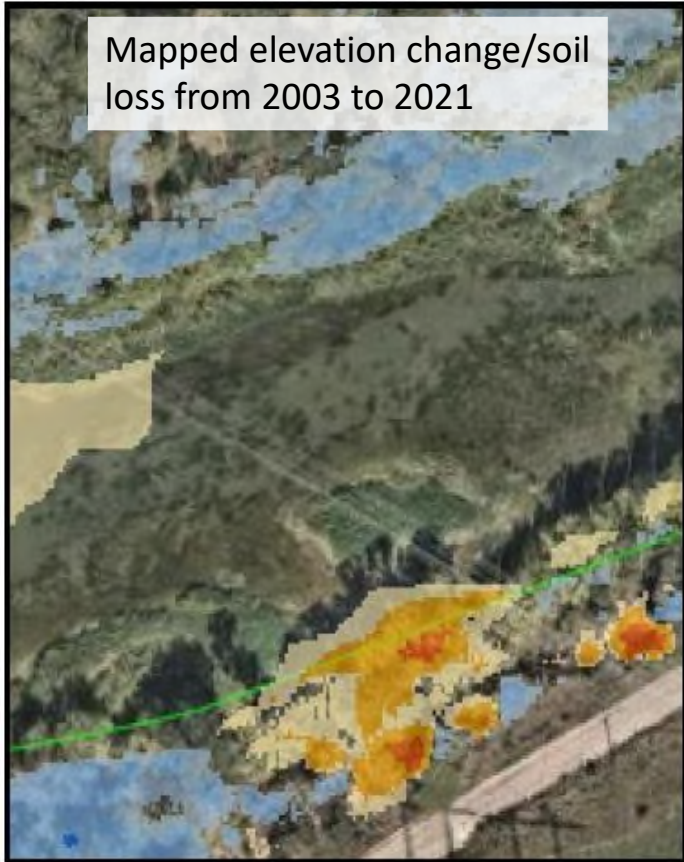


# 1. Outer bend erosion

(fluvial erosion & subsequent mass wasting)



## 2. Localized erosive scarp failures (rotational or mass wasting)







# 3. Localized shifts in sand bars

(fluvial erosion and subsequent mass wasting if on high bank)



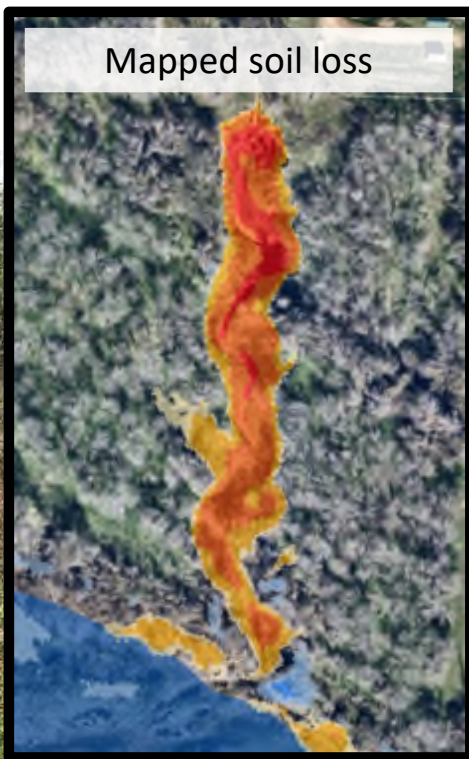
Mapped elevation change/soil loss from 2003 to 2021



# 4. Gullies from concentrated flow (incision & subsequent mass wasting)

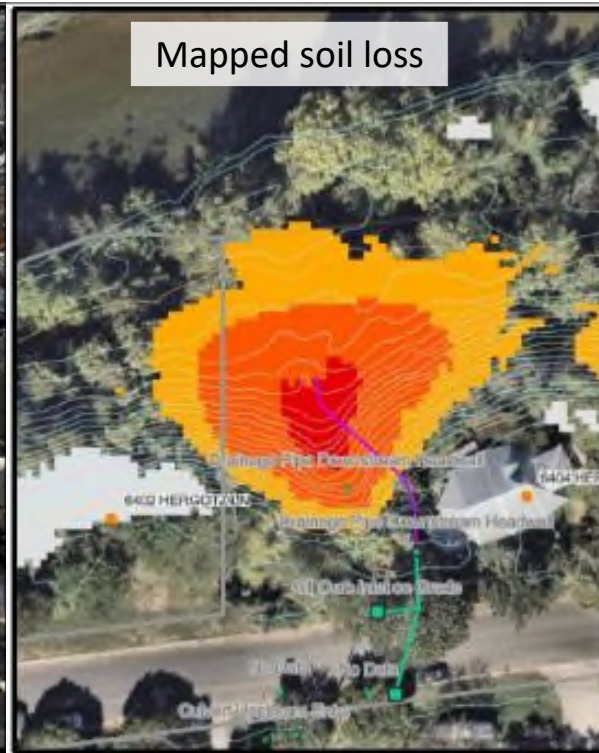


Mapped soil loss



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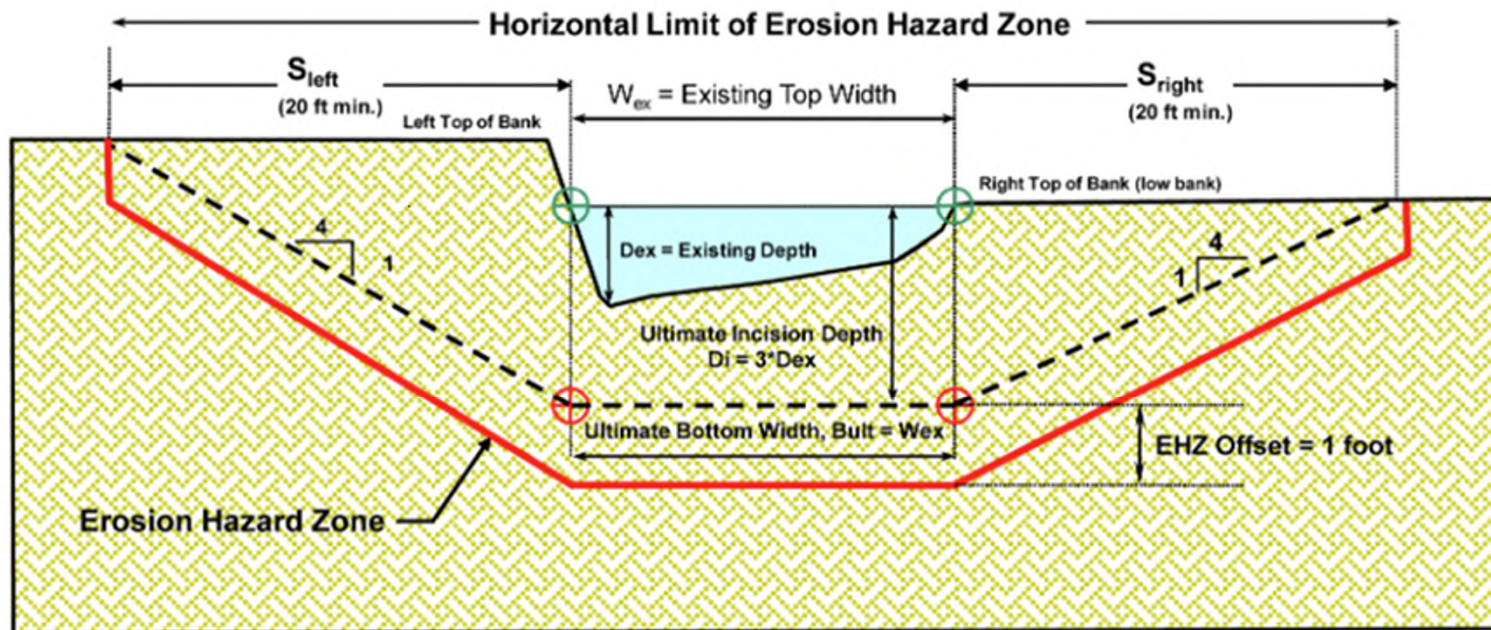
(incision & subsequent mass wasting)





# Existing DCM\* Criteria: Used for Creeks

BVO



- ⊕ Existing Top of Bank
- ⊕ Future Toe of Bank

\* DCM = Drainage Criteria Manual