

# US Army Corps of Engineers- Riverside Levees Rehabilitation Project

Julianna Adams  
Chief of Emergency Management  
and Government Affairs

Joint Regional Water Quality  
Monitoring/MSAR TMDL Task Force  
Meeting

April 17, 2023



# Presentation Summary

- Levee History
- Protection of Structures
- Corps Project Features and Contract Award
- Levee Construction
- Re-establishment of Vegetation
- Monitoring and Adaptive Management Plan (MAMP) Commitments
- Santa Ana River Sucker Monitoring
- Questions

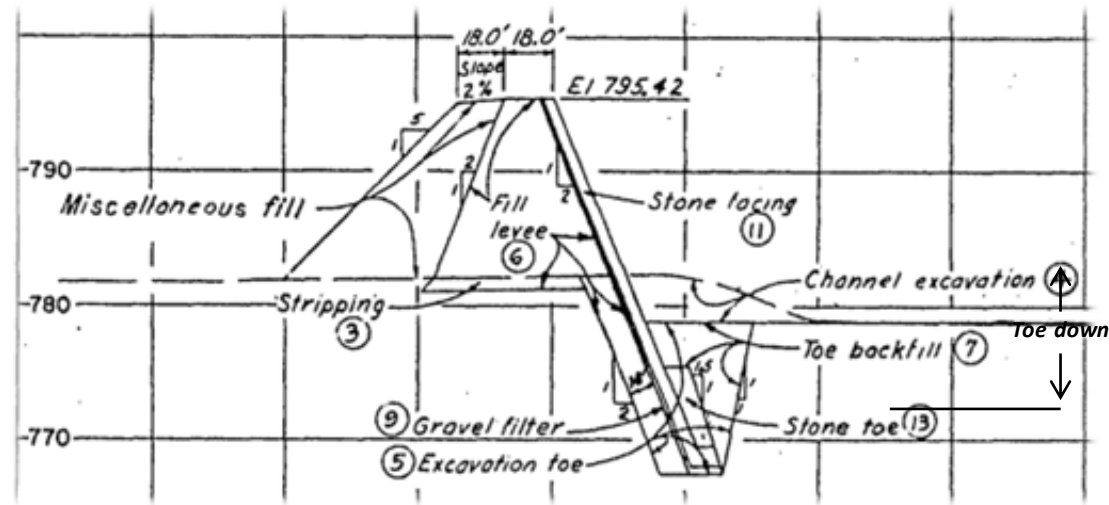


*Looking North towards Mission Blvd. Bridge over the Santa Ana River. Photo taken by USACE*



# Levee History

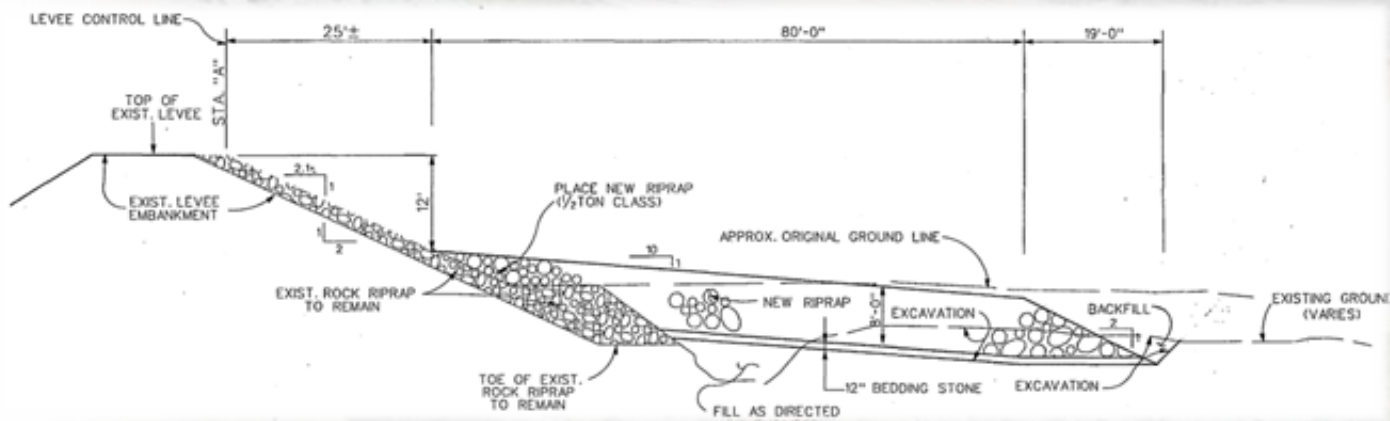
- Federally authorized under Flood Control Act of 1950
- Constructed by the Corps in 1957
  - Compacted Fill (landside)
  - 12-18" rip rap (riverside)
  - 1V: 2H slope
  - **3-feet toe down for scour protection**
- Turned-over to the District for Maintenance
  - Riverside Levee 1 – 1958
  - Riverside Levee 2 – 1959



1962 - Looking North towards the 60 fwy. Archive photo from RCFC&WCD

# Levee History

- District constructs levee groins in 1995
  - 100' long towards channel centerline
  - Located approx. 500' apart
  - 8-foot high and 48-feet wide
  - Used to keep water away from the levee toe
  - Located at:
    - Right levee between SR 60 and Mission Blvd.
    - Left levee between County Line and SR 60



1998 – Santa Ana River. Archive photo from RCFC&WCD



# Levee Migration

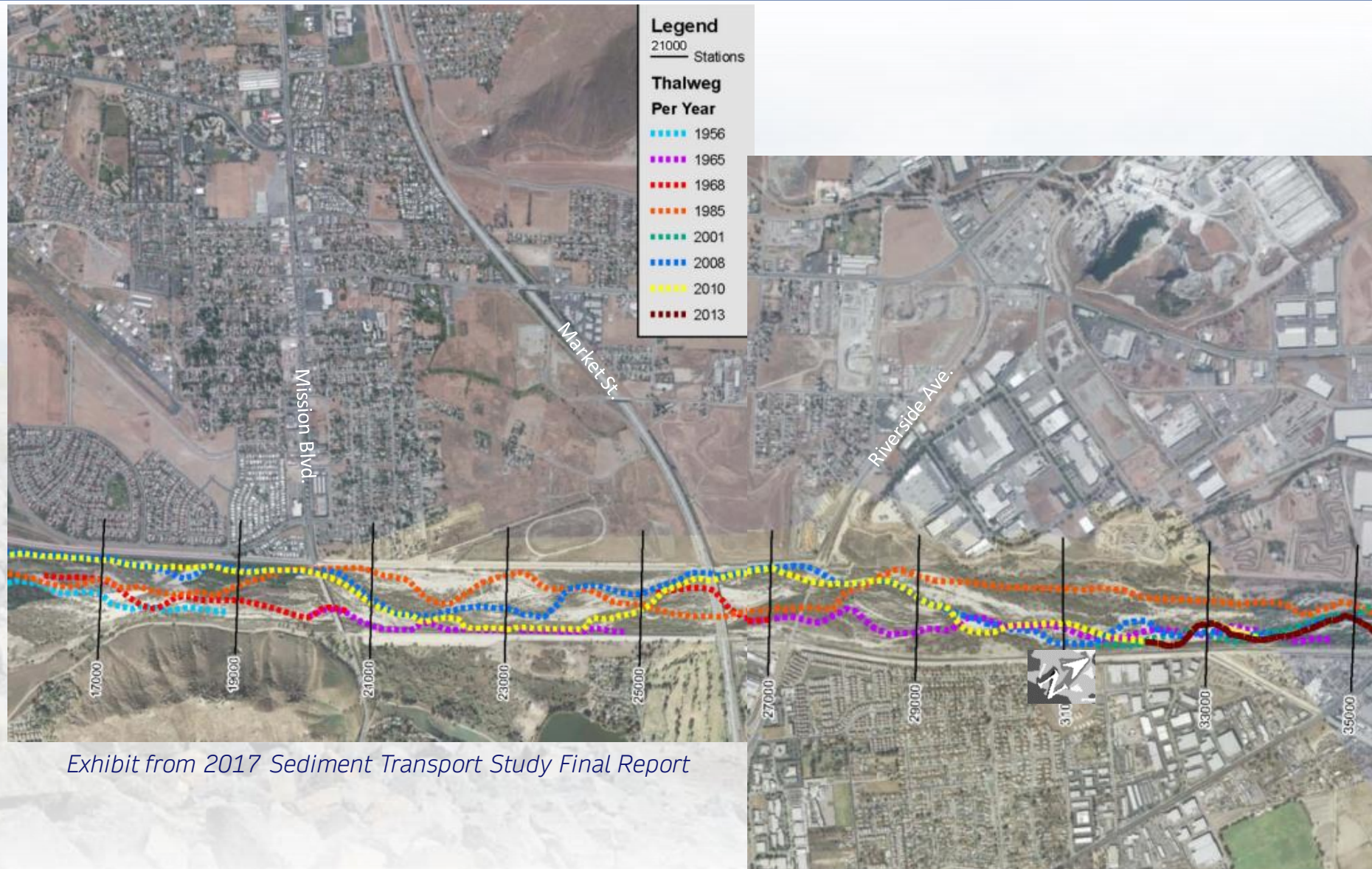


Exhibit from 2017 Sediment Transport Study Final Report



# Levee Damage Throughout the Years



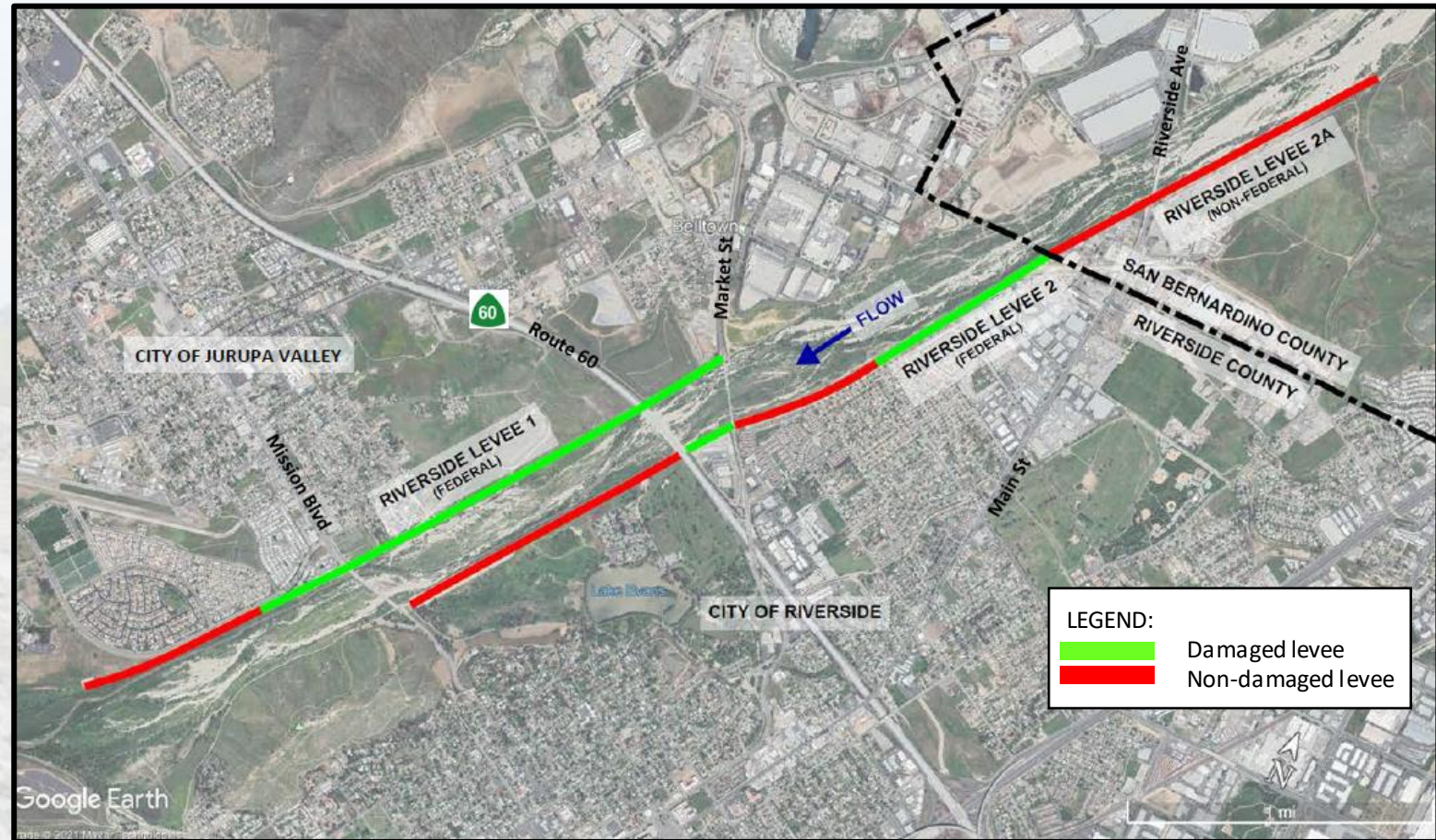


# Levee Damage

- Dec 2010 to Jan 2011- Damaged by a series of storms
  - Peak discharge for storms: 49,100 cfs
- May 2011 - District requested rehabilitation assistance under the Corps Rehabilitation & Inspection Program (PL84-99)

## Corps determined damages:

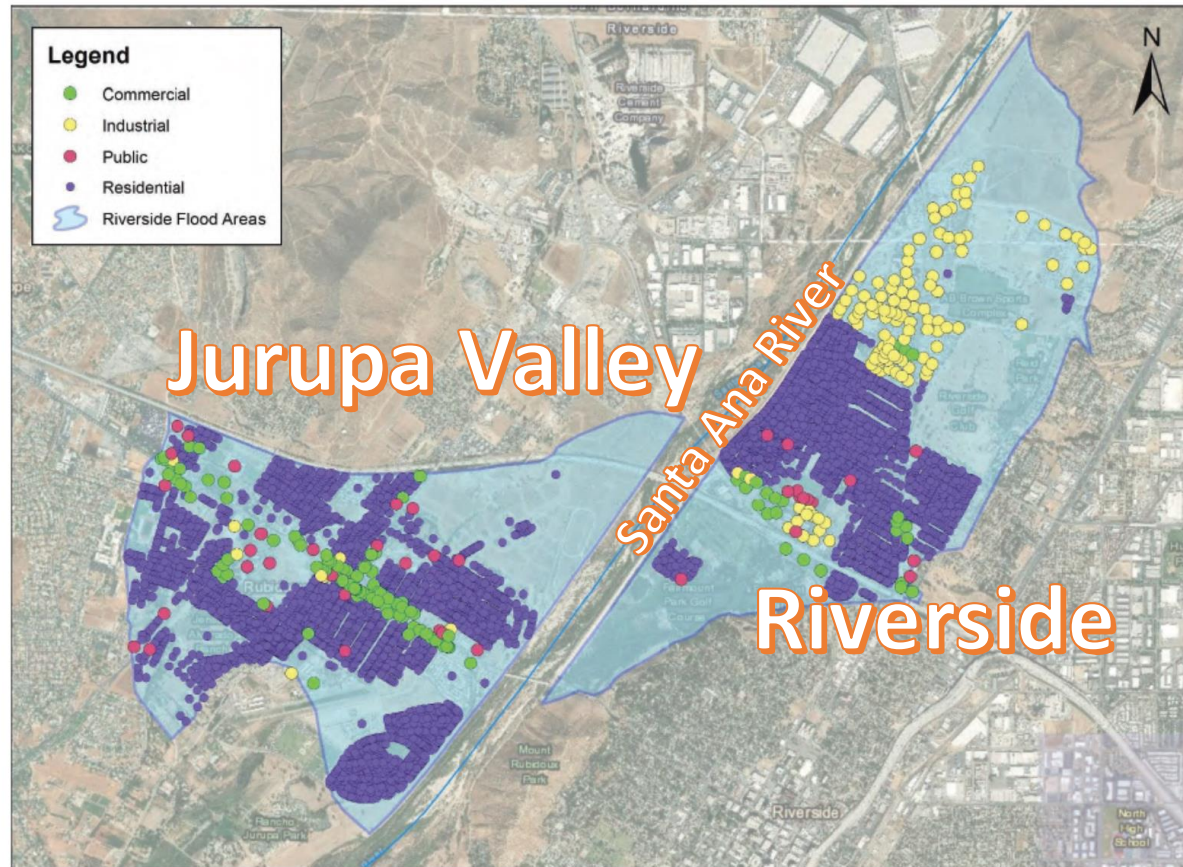
- Damage 13,000 LF
  - 20,000 CY of lost rip rap
- 5-foot of invert scour
  - Only designed for 3-foot
- Damage to groins
  - Buried with sediment or washed away
  - Groin length reduced by 75%
  - Estimated 3,500 CY of lost rip-rap





# Protection of Structures

Figure 1: Location of Structures being protected by the Riverside Levees Project



- The Riverside Levees rehabilitation project will restore and enhance the levees to ensure they continue protecting approximately \$1.5 billion of infrastructure. The project will ensure flood protection for more than 4,300 structures, of which more than 4,000 are residential structures in the Riverside and Jurupa Valley areas.

Table 1: Summary of Structures protected by the Riverside Levees Project

Category	Count	Structure Value	Content Value	Total Value
Commercial	123	\$82,476,000	\$48,612,000	\$131,088,000
Industrial	131	\$79,394,000	\$141,436,000	\$220,830,000
Public	40	\$69,961,000	\$30,864,000	\$100,825,000
Residential	4,035	\$550,462,000	\$540,341,000	\$1,090,803,000
Total	4,329	\$782,293,000	\$761,253,000	\$1,543,546,000



# Corps Project Features and Contract Award

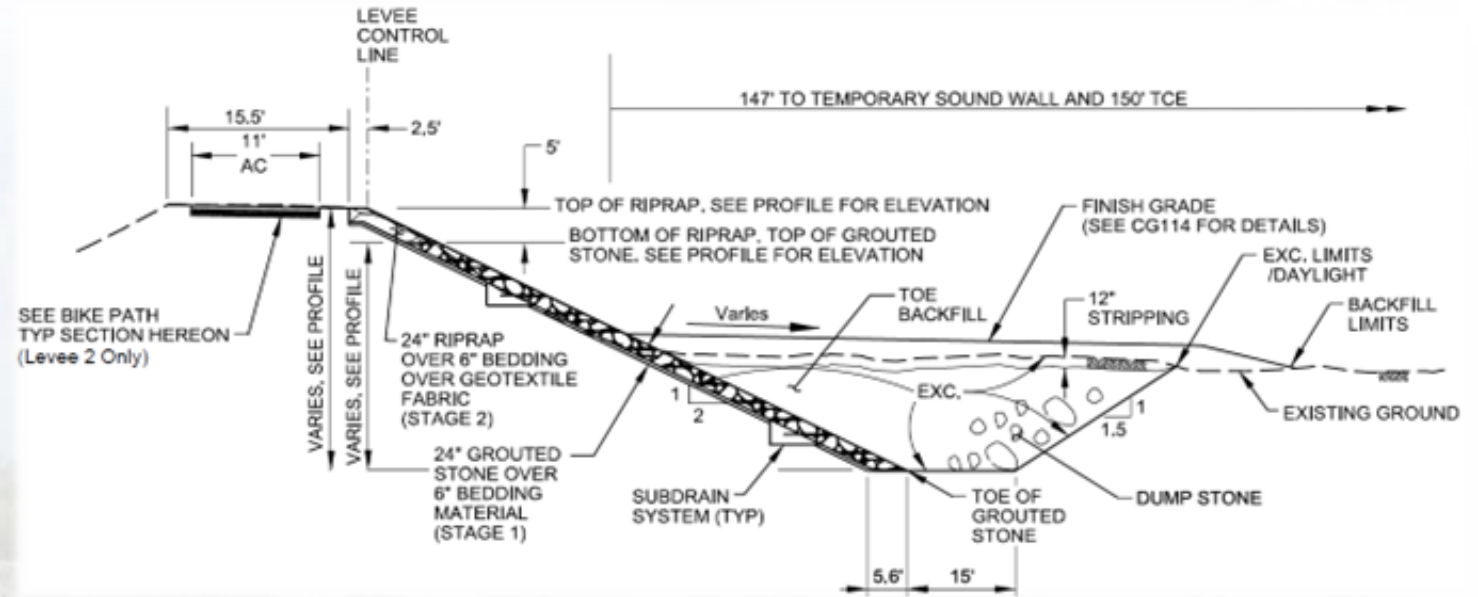


- **Project Features**

- 13,000 lineal feet of levee rehabilitation
- Levee toe extension approx. 10 feet
- Remove existing stone protection and replace with grouted rip rap
- Thickness of slope remains unchanged
- Channel conveyance remains unchanged
- Removal of groins within the rehabilitated project
- 8,200 lineal feet of temporary diversion channel constructed

- **Contract Award**

- \$36,075,000
- Construction duration: approx. 4 years
- Notice to Proceed was issued in June 2022



*Looking Southwest from Market St.*



# Levee Construction Preparation

Completed to date:




- Debris Removal
- Unhoused population Coordination
- Clearing and Grubbing
- Southern and Middle Diversion Channel construction
- Sound Berms
- Dewatering Wells



## 90 Encampments within Project Limits

-  13 individuals housed
-  151 individuals provided housing materials
-  288 total engagements

## Other Resources provided

-  42 with path to public benefits
-  26 with mental health resources
-  19 with legal services

## Clean-Up

-  259 tons trash  
(518,000 lbs)
-  \$300,000 cost  
(labor, materials, dumping cost)

Contact us  [RIVCOFLOOD.ORG](http://RIVCOFLOOD.ORG)  951-955-1200

Follow us    @RIVCOFLOOD





# Construction Schedule

Task	Date
Southern Diversion Channel Construction	October 2022 - December 2022
Central Diversion Channel Construction	November 2022 - December 2022
Dewatering Well Installation	December 2022 – February 2023
Northern Diversion Channel Construction	September 2023-October 2023
Phase 1 Right Levee Construction	Jan 2023 – May 2024
Phase 1 Left Levee Construction (Market St & 60 FWY)	May 2024- June 2024
Phase 2 Left Levee Construction	May 2024 – December 2024
Road/Bike Path Construction	December 2024 – January 2025
Landscape and Irrigation – Right Levee	November 2024 – February 2025
Landscape and Irrigation – Left Levee	December 2024 – March 2025
Project Closeout	February 2025 – June 2025

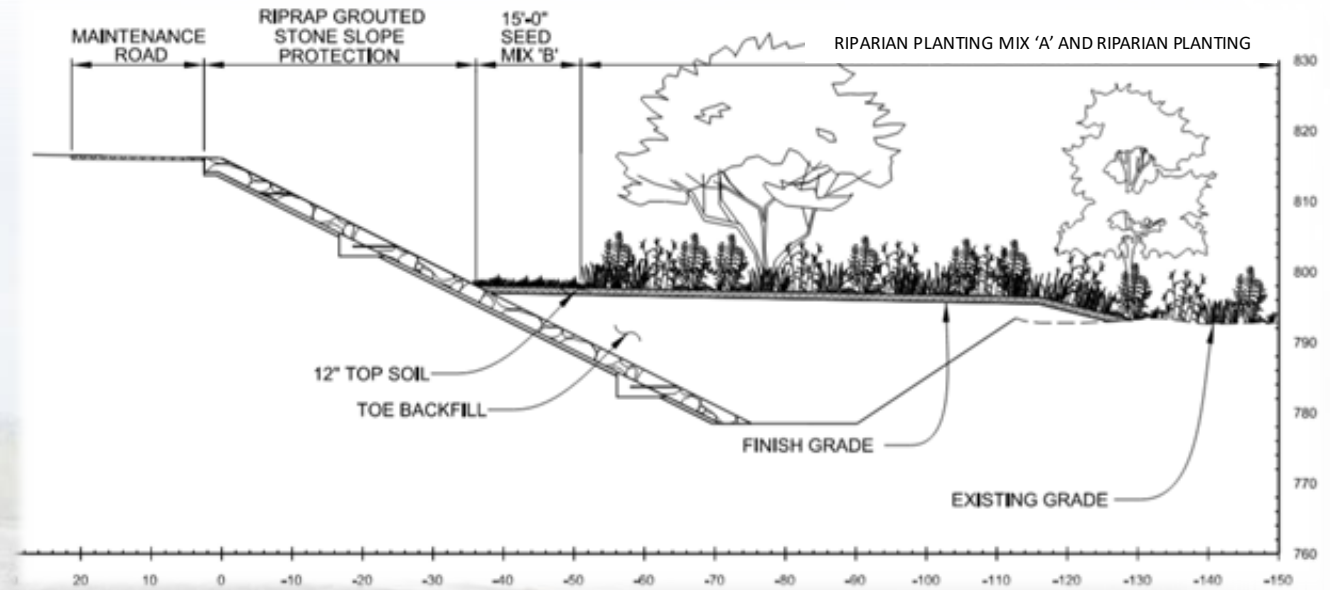


*Dewatering Well Installation*



# Re-Establishment of Vegetation after Construction

- Riparian vegetation removed **within project TCE** will be replanted:
  - Seed Mix A and Riparian Plantings
  - Seed Mix B
- Area will remain free of woody exotic plants
- TCE areas will be monitored and maintained for 5 years
- Expecting Right Levee TCE areas to be reseeded in November 2024
- Left levee vegetation removal to begin by September 2023, replanting to begin December 2024



SEED MIX A - RIPARIAN VEGETATION SEED MIX

SYMBOL	BOTANICAL NAME	COMMON NAME	STOCK TYPE	PURE LIVE SEED (PLS) LBS/ACRE
	SHRUBS/SUB-SHRUBS:			
	BACCHARIS PILULARIS	COYOTE BRUSH	SEED	0.2
	BACCHARIS SALICIFOLIA	MULE FAT	SEED	0.2
	PLUCHEA ORDATA	SALT MARCH FLEABANE	SEED	0.2
	PLUCHEA SERICEA	ARROW WEED	SEED	0.2
	ROSA CALIFORNICA	CALIFORNIA ROSE	SEED	0.2
	HERBS AND FORBS:			
	AMBROSIA PSILOSTACHYA	WESTERN RAGWEED	SEED	0.6
	ARTEMISIA DOUGLASIANA	MUGWORT	SEED	0.15
	ARTEMISIA DRACUNCULUS	TARRAGON	SEED	0.15
	URTICA DIOICA SSP. HOLOSERICA	STINGING NETTLE	SEED	0.6
	GRASSES:			
	LEYMUS CONDENSATUS	GIANT WILD RYE	SEED	1.3
	MUHLENBERGIA RIGENS	DEERGRASS	SEED	0.3
	EROSION CONTROL/NURSE CROP:			
	BROMUS CARINATUS	CALIFORNIA BROME	SEED	8.0
	DEINANDRA FASCICULATA	TARPLANT	SEED	0.6
	ASTHENIA GLABRATA	GOLDFIELDS	SEED	0.5
	PLANTAGO OVATA	PLANTAIN	SEED	10.0
	TRIFOLIUM TRIDENTATUM	TOMCAT CLOVER	SEED	2.0
	VULPIA MICROSTACHYS	SMALL FESCUE	SEED	4.0

NOTES:  
1. PROVIDE TEMPORARY IRRIGATION AND MAINTAIN FOR 12-MONTHS PER SPECIFICATIONS.

RIPARIAN VEGETATION PLANTINGS

BOTANICAL NAME	COMMON NAME	STOCK TYPE	QTY PER ACRE	AVG. O.C. SPACING	MIN. SETBACK FROM TOE RD.
BACCHARIS SALICIFOLIA	MULEFAT	CUTTINGS	48	30'	6'
SALIX EXIGUA	SANDBAR WILLOW	CUTTINGS	48	30'	8'
SALIX GOODINGII	BLACK WILLOW	CUTTINGS	48	30'	15'
SALIX LASIOLEPIS	RED WILLOW	CUTTINGS	48	30'	20'
SALIX LASIOLEPIS	ARROYO WILLOW	CUTTINGS	48	30'	10'

SEED MIX B - DIKE SEED MIX

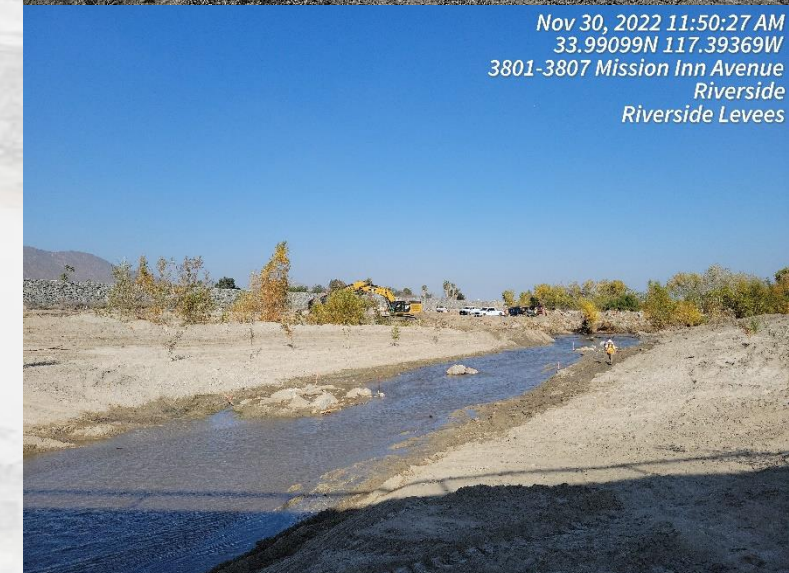
BOTANICAL NAME	COMMON NAME	STOCK TYPE	PURE LIVE SEED (PLS) LBS/ACRE
GRASSES:			
BROMUS CARINATUS 'CUCAMONGA'	CUCAMONGA BROME	SEED	3.0
HORDEUM BRACHYANTHERUM SSP. CALIFORNICUM	CALIFORNIA BARLEY	SEED	2.0
HORDEUM BRACHYANTHERUM	MEADOW BARLEY	SEED	2.0
ELYMUS CONDENSATUS	GIANT WILD RYE	SEED	1.0
ELYMUS TRITICOIDES	VALLEY WILD RYE	SEED	4.0
MUHLENBERGIA RIGENS	DEERGRASS	SEED	0.5
NASSELLA PULCHRA	PURPLE NEEDLEGRASS	SEED	5.0
FESTUCA MYCROSTACHYS	SMALL FESCUE	SEED	5.0



# Monitoring and Adaptive Management Plan (MAMP) Commitments



- 5-year period of monitoring and adaptive management for Santa Ana Sucker and **within the three Diversion Channels:**
  - Quarterly Monitoring for 1<sup>st</sup> year of construction
  - Biannual Monitoring for years 2-5
  - Survey Reports provided to USFWS within 30 days after completion of survey
- After 5 year monitoring period, Diversion Channel will remain in place to allow nature to take its course



*Southern Diversion Channel*



# Re-Establishment of Vegetation





The background of the slide is a photograph of a landscape. In the foreground, there is a large, rocky, and somewhat barren area, possibly a dry riverbed or a construction site. In the middle ground, a river flows through a valley. The background is shrouded in a thick fog or mist, with some distant hills visible. The overall tone is muted and atmospheric.

# QUESTIONS?