

# A Past River for a Future Arizona

## Salt River Environmental Restoration Project



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**CDM HDR**



# Presentation Outline

Janelle Moyer, P.E., HDR

- Overview
- Goals
- Components

Brian M. Murphy, P.E., CDM

- Channel Restoration
- Next Steps



# Overview

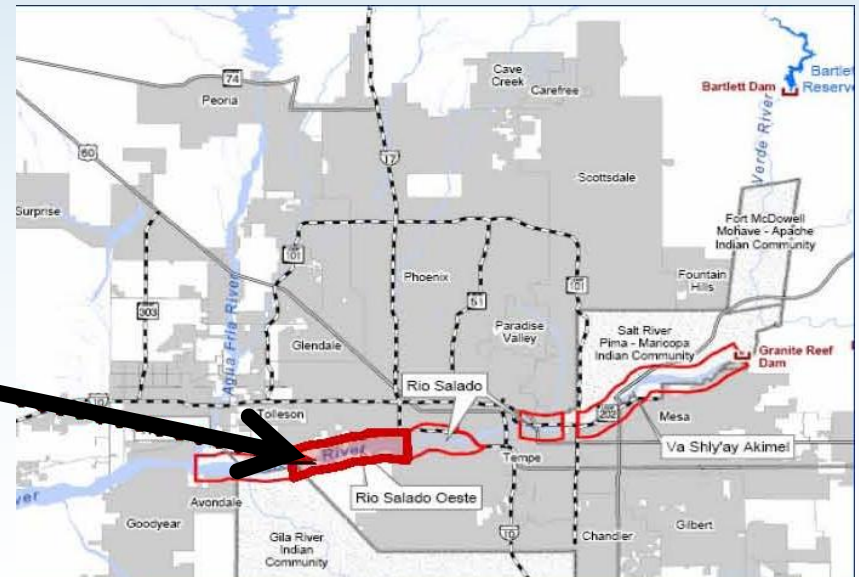
## Project Location

- Rio Salado Oeste is an 8-mile reach of the Salt River in Phoenix, Arizona



## Project Team

- Implemented by – USACE, Los Angeles District
- Project partner - City of Phoenix (COP)
- Habitat design - Wass Gerke & Associates Inc.
- Engineering design – HDR|CDM Joint Venture Team



# Overview

## Project Timeline

- September 2006 – Feasibility Study and Environmental Impact Statement (EIS)
  - USACE and COP
- November 2007 – Authorization by the Secretary of the Army
  - Water Resources Development Act of 2007

(5) SALT RIVER (RIO SALADO OESTE), MARICOPA COUNTY, ARIZONA.—The project for environmental restoration, Salt River (Rio Salado Oeste), Maricopa County, Arizona: Report of the Chief of Engineers dated December 19, 2006, at a total cost of \$166,650,000 with an estimated Federal cost of \$106,629,000 and an estimated non-Federal cost of \$60,021,000.

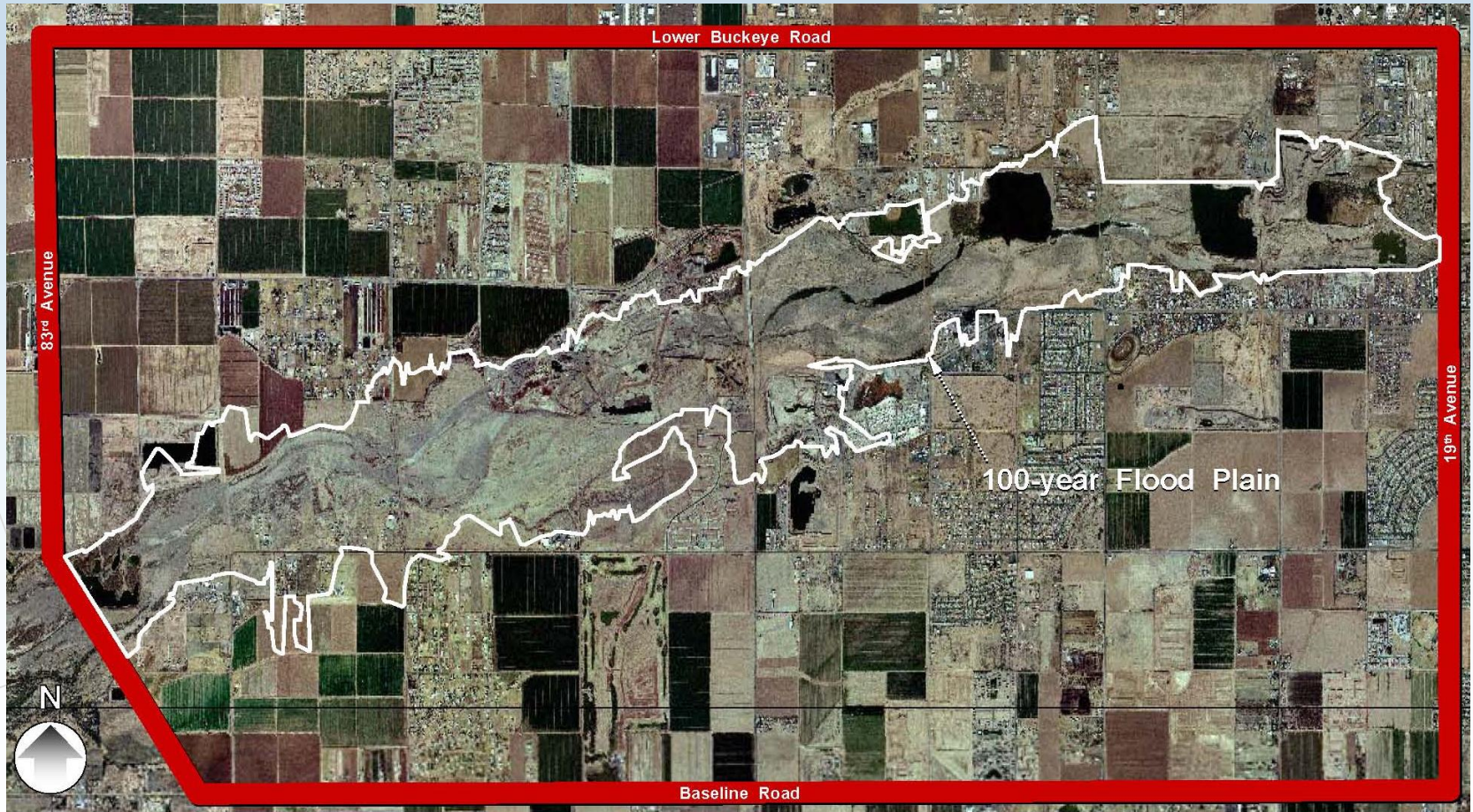
- July 2010 - Conceptual Design Documentation Report (CDDR)
  - HDR

## Currently Underway

- Design Documentation Report (DDR) for Low Flow Channel design for the upstream half (CDM)
- DDR for Pump station and Reservoir supplying water to future habitat (HDR | CDM)

# Overview

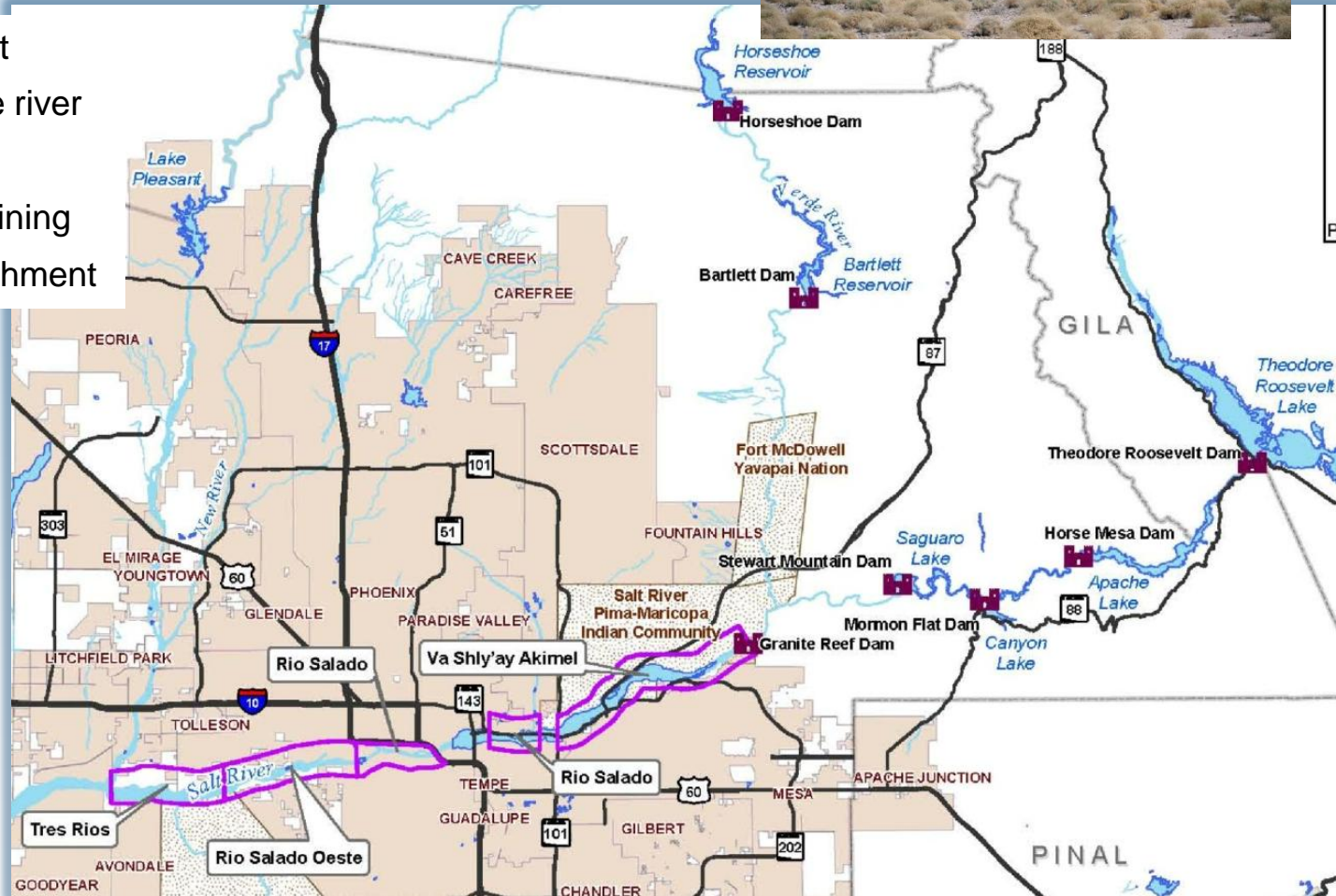
## Study Area



# Overview

## Past influences

- Urban development
- Modifications to the river system
- Sand and gravel mining
- Floodplain encroachment



# Overview

## Present condition

- The Salt River is now
  - a “dry river” that flows only ephemerally from storm runoff and effluent discharge
  - a highly disturbed riverbed
  - has minimal vegetation



Concrete debris



Mining operations in the river



Minimal vegetation

RSO is the last and most difficult Salt River reach within Phoenix to be restored

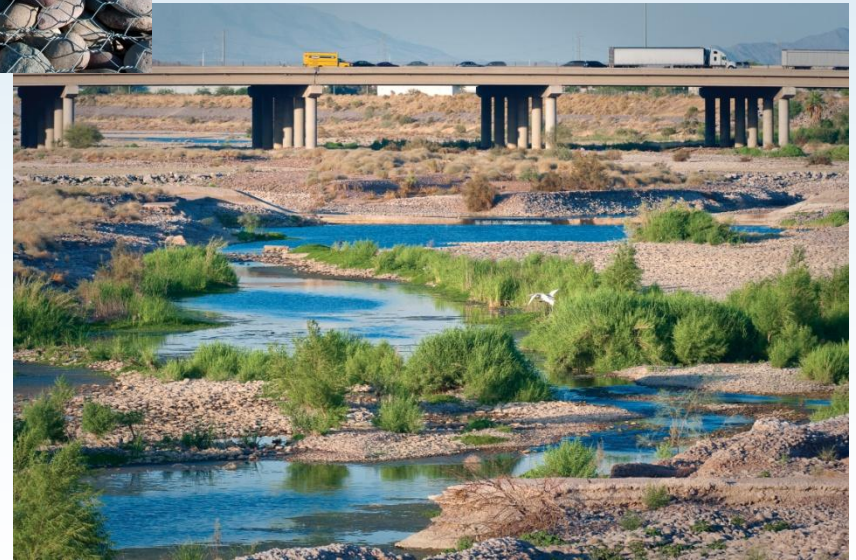
# Goals

## Future project goals...

- Restore natural ecosystem
- Improve recreation opportunities
- Improve water quality
- Enhance property values
- Reuse reclaimed materials
- Reduce flooding damages



*Photos from restored upstream reach,  
Rio Salado*





# Components

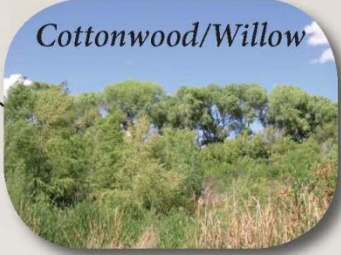
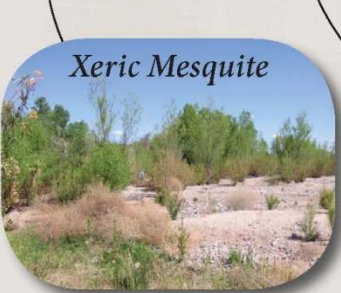
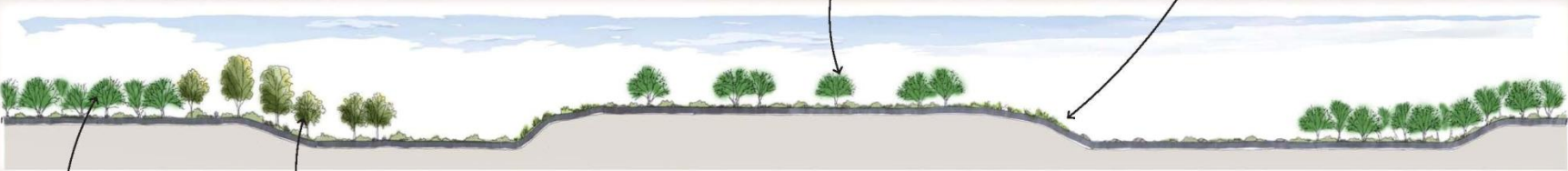
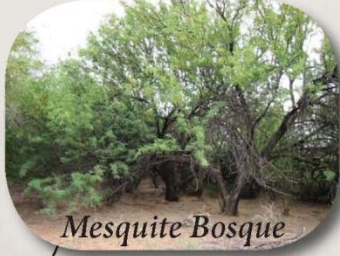
- 1,000+ acres of re-vegetation
- 100+ acres of wetland habitat
- Sand and gravel mining pit restoration
- Management of 120 acres of invasive species
- Water system to deliver 8 MGD of effluent water to habitat
- Recreational facilities and access
- Roadway network
- River channel restoration



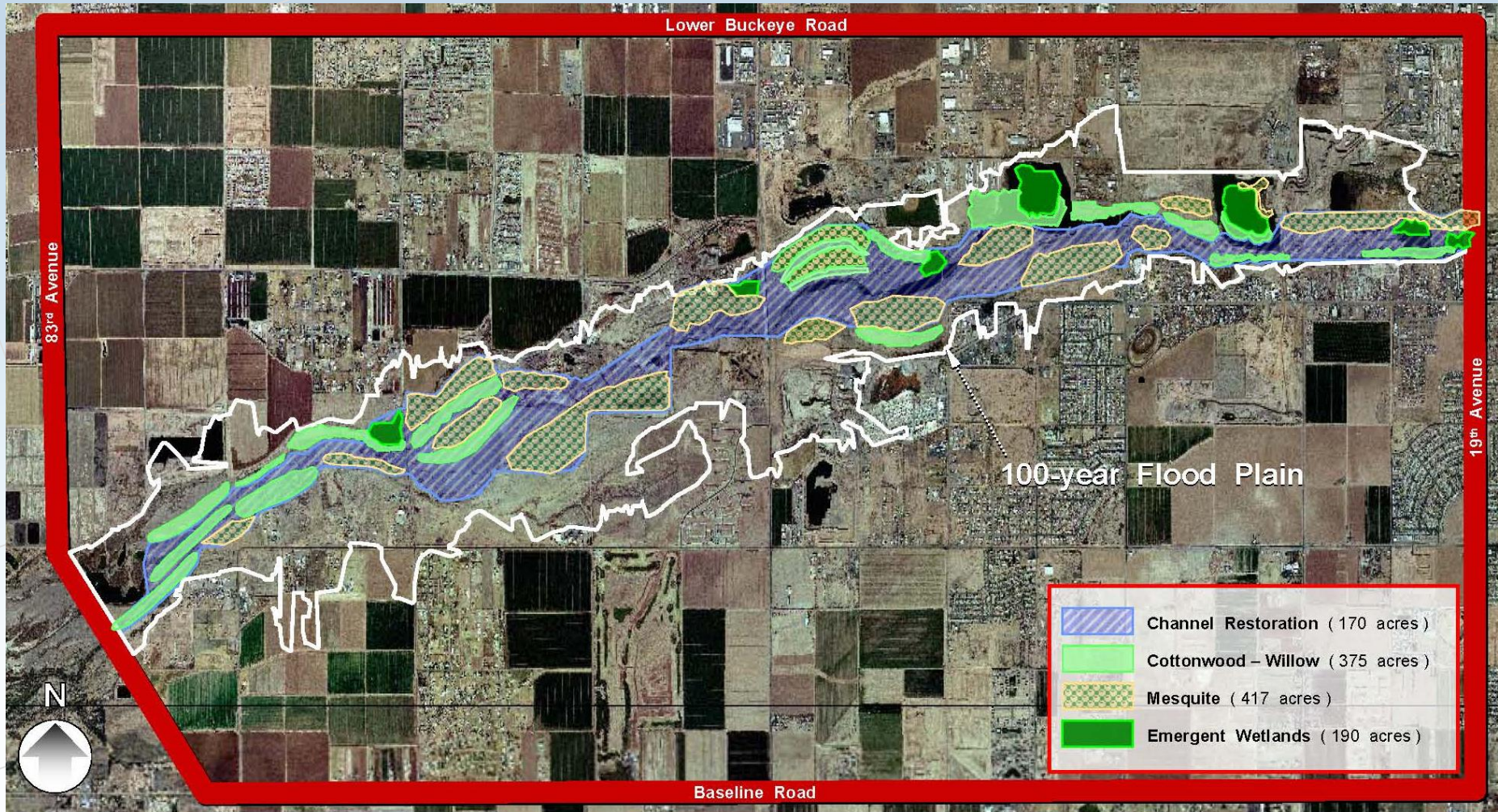
*Photos from restored upstream reach,  
Rio Salado*

# Components

## Restored Habitat Types



# Recommended Plan



# Channel Restoration

## Purpose

- Primary: restore a “functioning” river channel
  - designed based on a natural geomorphic state
  - limit “hard” engineering
- Secondary: protection of habitat and infrastructure
  - keep more frequent runoff events confined to certain areas of the river



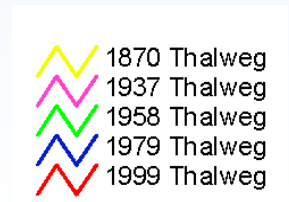
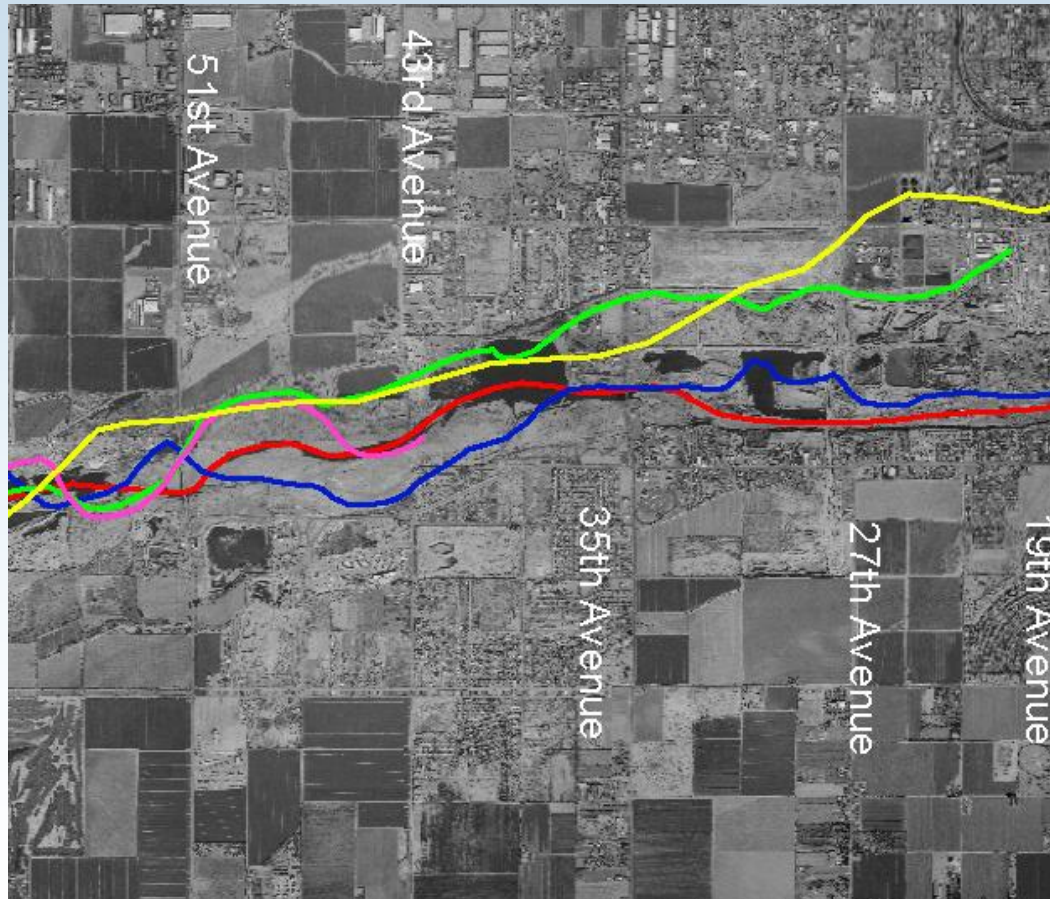
# Channel Restoration

## Design Criteria

- Utilize the existing low flow channel horizontal alignment where possible
- Follow existing longitudinal slope (vertical alignment)
  - ~0.00076 ft/ft
- Convey approximately the 5-year discharge
  - 20,000 cfs
  - occasional “minor” overbank flooding
- No increase in the regulatory (100-year) water surface elevation
  - 166,000 cfs

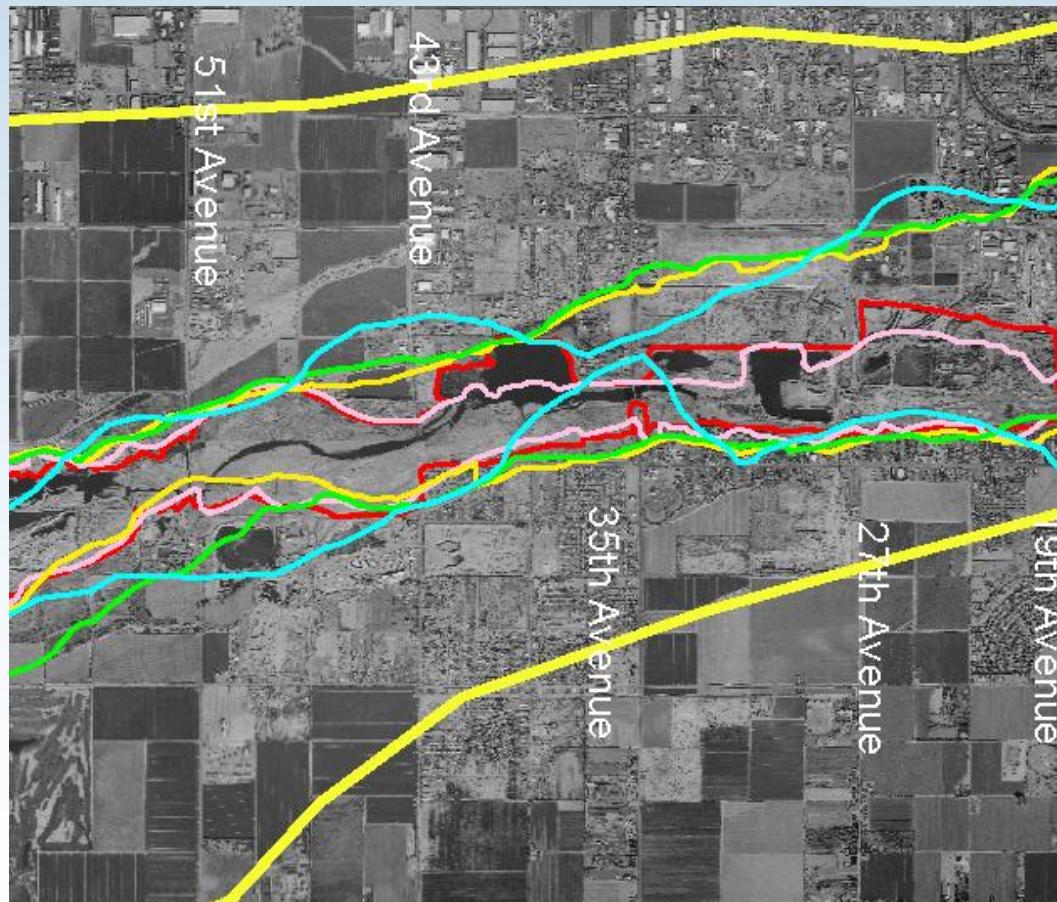
# Channel Restoration

## Historical Thalweg Alignment



# Channel Restoration

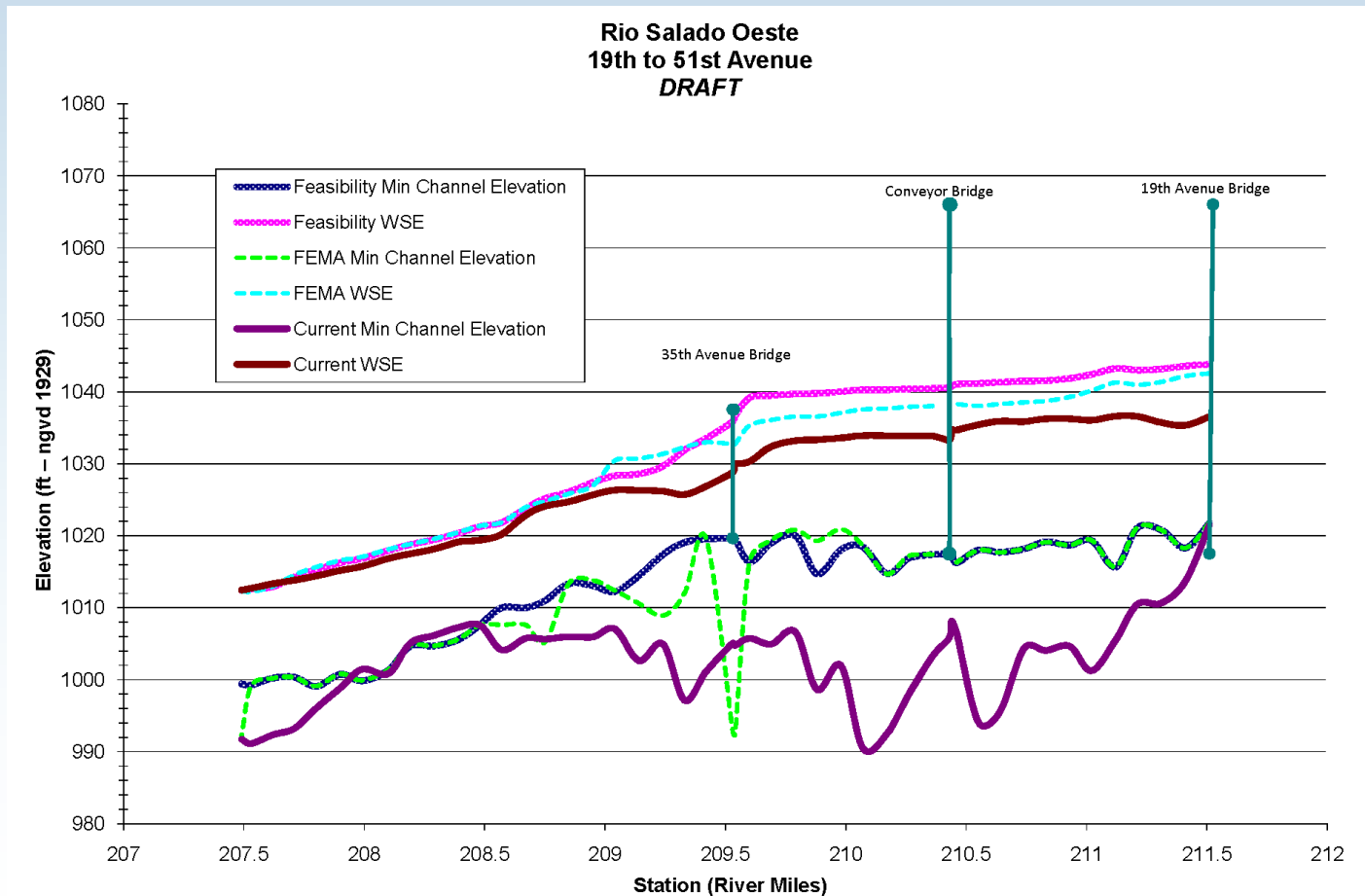
## Historical Bank Lines



- Recent geologic banks
- 1870 Bank Lines
- 1937 Bank Lines
- 1958 Bank Lines
- 1979 Bank Lines
- 1999 Bank Lines

# Channel Restoration

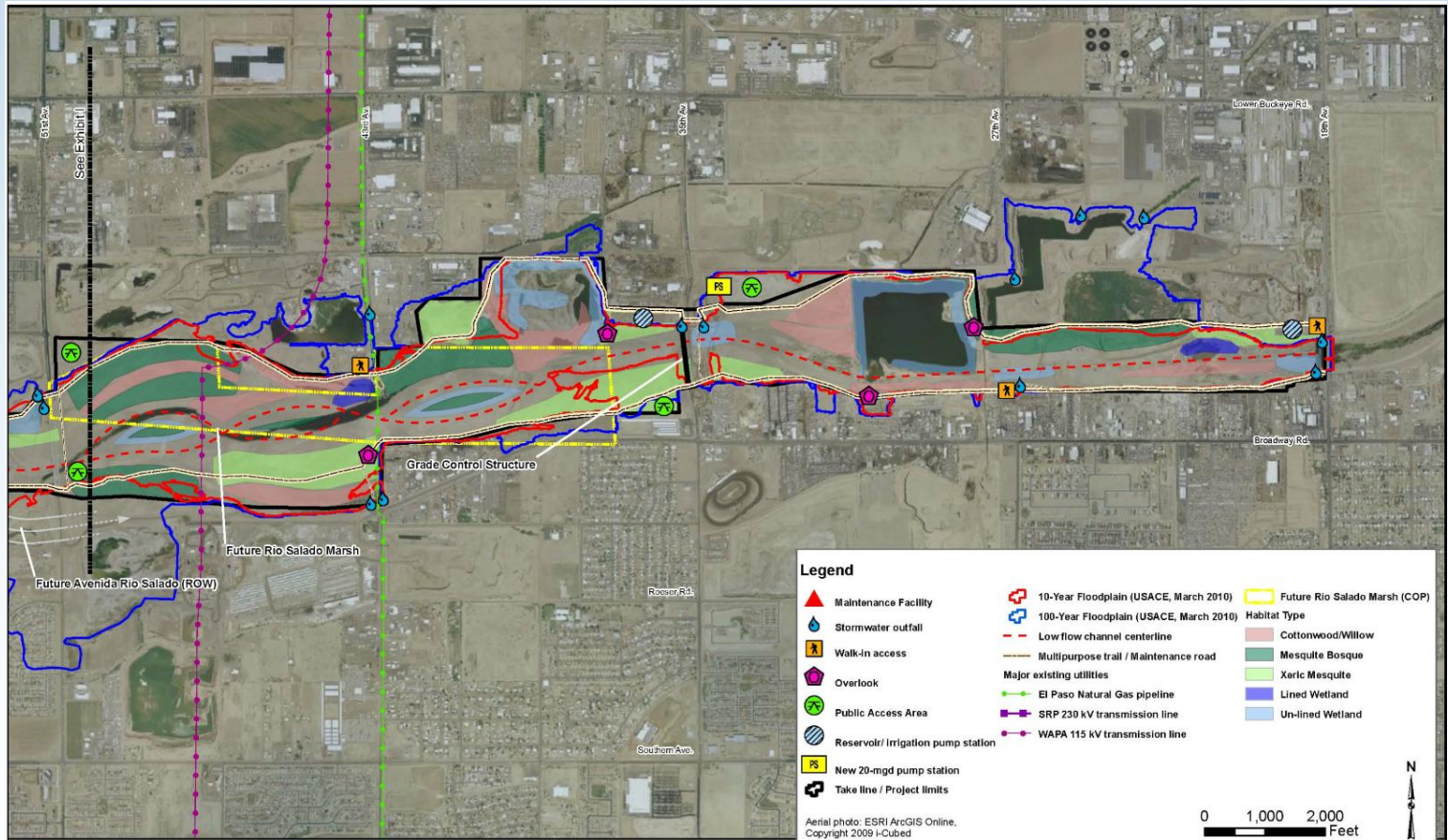
## Feasibility Design





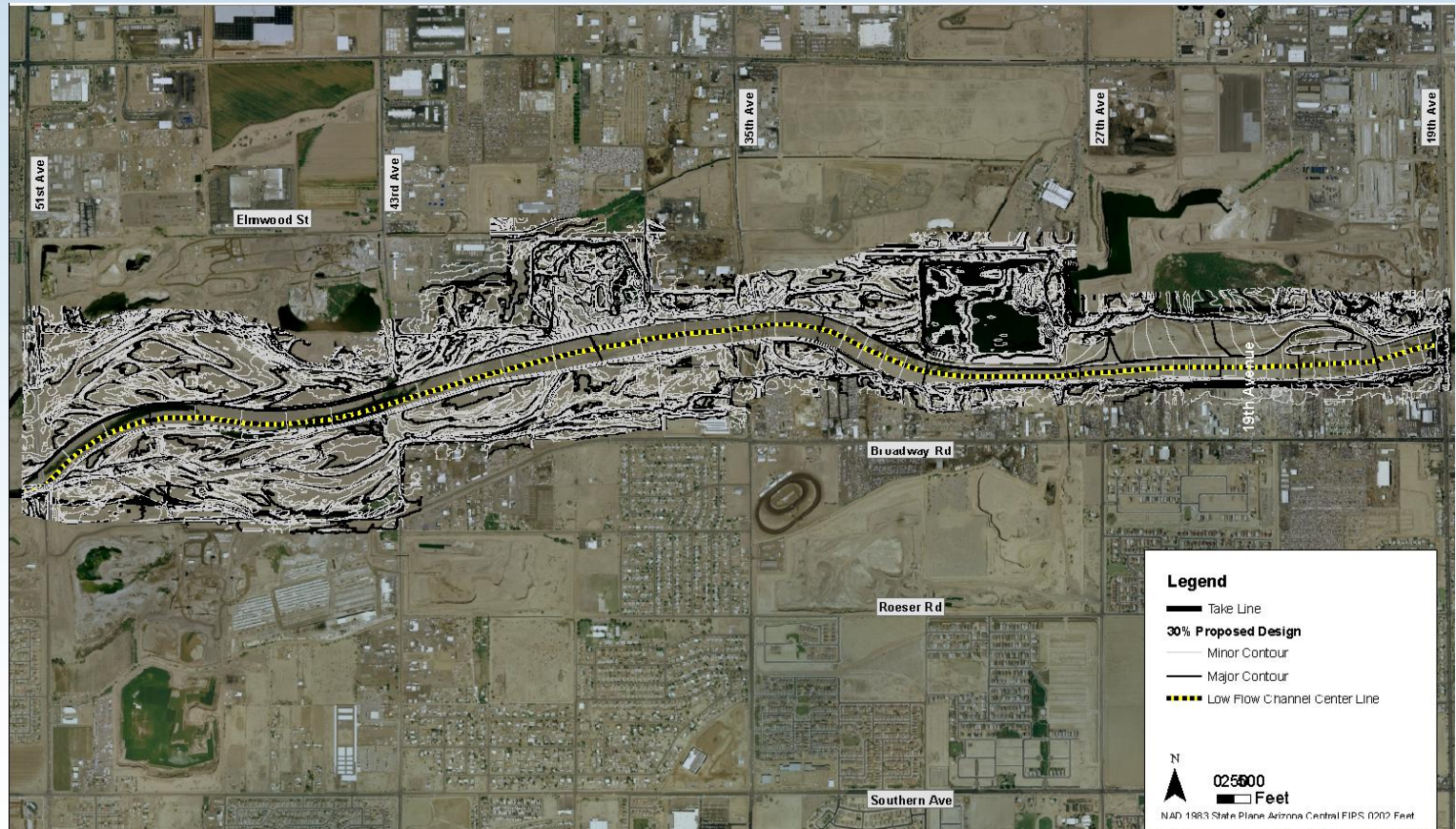
# Channel Restoration

## Feasibility Design



# Channel Restoration

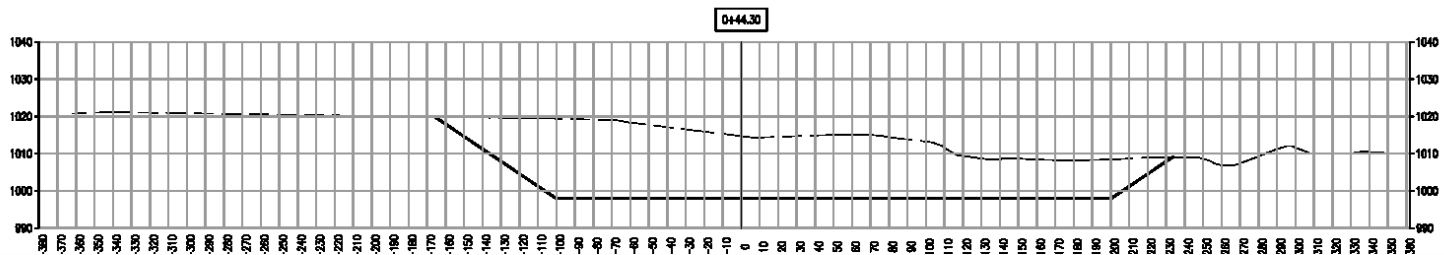
## Preliminary Design



# Channel Restoration

## Channel Geometry

- Width , depth, and capacity intended to replicate a naturally occurring low-flow channel in this river system
- Typical channel section
  - trapezoidal
  - bottom width varying from 200 to 385 feet wide
  - 3:1 side slopes



# Next Steps

- Channel Restoration
  - 60% design in progress
  - Final design early 2012
- Water infrastructure
  - 60% design complete
  - Final design early 2012
- Design of other project elements
- Estimate Construction start
  - February 2013

# Thank you!

- For more information contact  
Brian Kenny, USACE

## Q & A

