

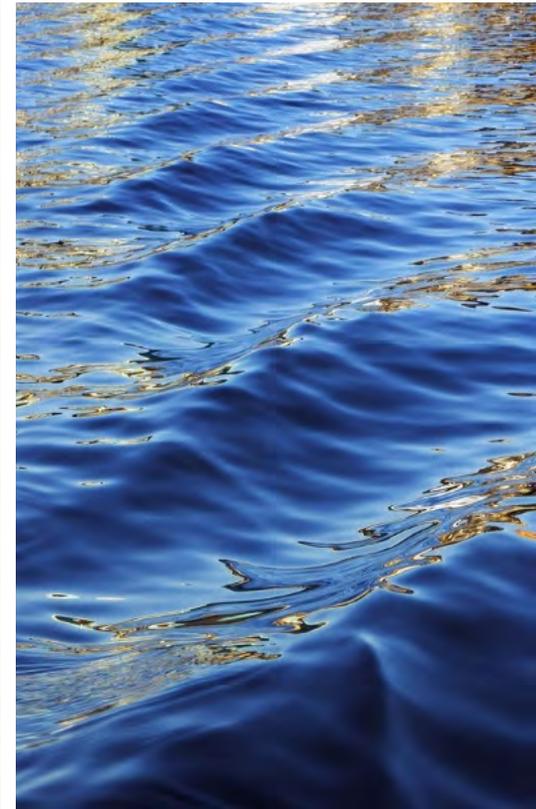
Santa Cruz River Management Plan

05-31-18

Evan Canfield – Pima County Regional Flood
Control District
Scott Altherr – CMG Drainage Engineering, Inc.



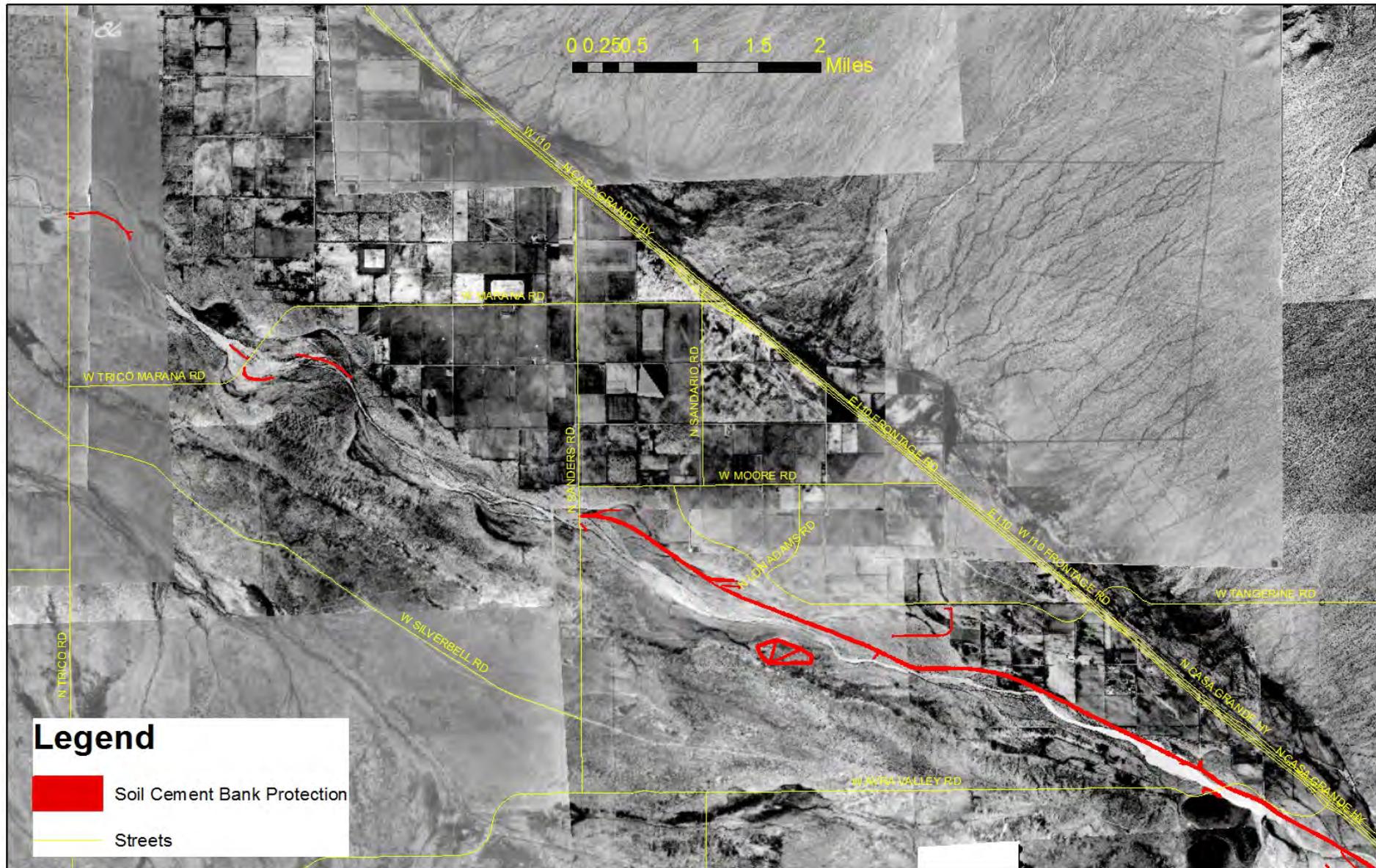
**CMG DRAINAGE
ENGINEERING, INC.**



Santa Cruz River Mgt Plan – Grant to Trico

- ***The purpose of this project*** is to develop a management strategy to balance flood risk management, drainage infrastructure protection, water recharge, recreation opportunities and riparian habitat preservation for the Santa Cruz River from Grant to Trico.

1936 to Present Comparison (North of Avra Valley Rd) *Living River* 'Marana Flats Reach'



Increased Infiltration

Remnant of
Clogging Layer
'Schmutzdecke'



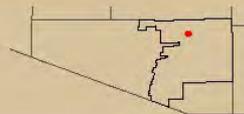
Potential for Increased Scour



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 Tucson, Arizona 85701-1207
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<http://www.rfcd.pima.gov>

Santa Cruz at Ina 2015

1 inch = 351 feet



Date:

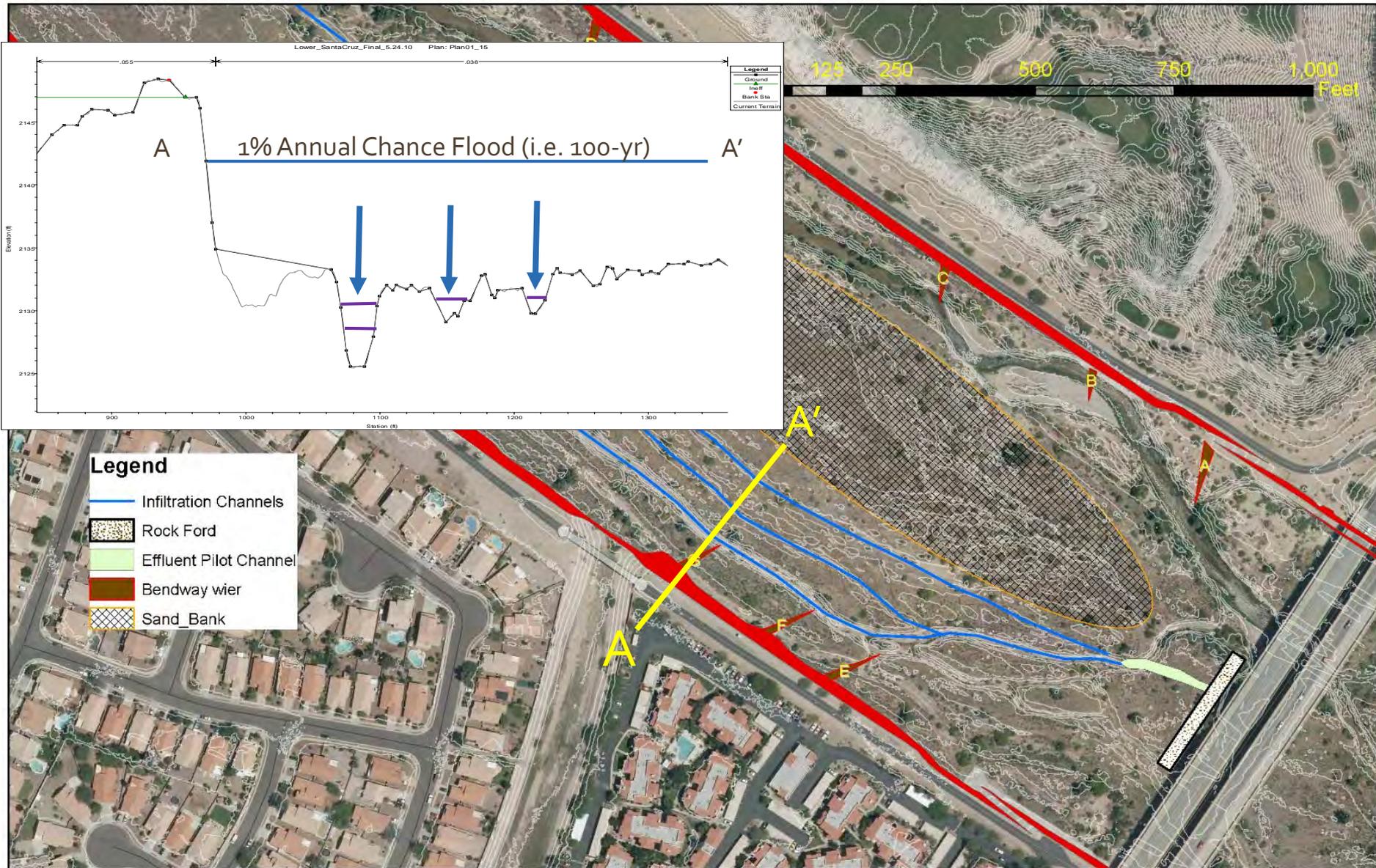
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Concept for a Multibenefit Habitat Project



'Awareness Level' Economic Valuation of Priorities (CMG in Partnership with Earth Economics)

- **Task 1 – Ecosystem Services Framework:**

- Water supply
- Habitat
- Flood control
- Nutrient management
- Cultural benefits.

- **Task 2 – Ecosystem Service Valuation:**

- Evaluation of 21 indicators
- Valuation for 50 year of services

- **Task 3 – Opportunities for Additional Analysis:**

Tasks & Timeline – Phase I (to June 30, 2019)

- **E1: Existing Conditions Analysis:** Collect and review previous studies, collect and review ongoing development activity within project limits, identify on-going drainage complaints, survey of structures, and identify critical facilities.
- **E2: Floodplain Delineations:** Floodplains should be re-delineated where the existing mapping is inaccurate using the existing FEMA FIS Discharge Values.
- **E3: FEMA Letter of Map Revision:** A Letter of Map Revision (LOMR) may be required to re-delineate Base Flood Elevations, the Floodway, and the 500-yr floodplain. (likely to be in review after June 30, 2019)
- **E4: Evaluation of Infrastructure Deficiency and Maintenance:** Floodplain conditions shall be evaluated to determine where maintenance is required to provide conveyance of the 1% annual chance flood with freeboard, or improvements are required to provide or improve reliability of the associated infrastructure (such as bank protection or levees) under flood conditions. Consultant shall identify areas of erosion hazards.
- **E5: Stakeholder Engagement:** Stakeholders will be engaged to coordinate the multiple interests in management of the Santa Cruz River at the start of Phase 1. They will also be gathered at the completion of the floodplain mapping.
 - **May, 2018 - Initial Meeting**
 - May 2019 – Post Floodplain Mapping and Infrastructure Deficiency Evaluation

Tasks - Phase II (after July 1, 2019)

- ***The following information are anticipated to be available at the initiation of Phase:*** and will provide further certainty as to what alternatives and implementation are feasible.
 - Sonoran Institute Conservation Priorities Mapping.
 - Concepts for Marana Drainage Master Plan
 - PAG Impaired Waters mitigation strategy.
 - Clarity on whether managed recharge of effluent will be credited similar to recharge of Central Arizona Project water.
- ***E6: Alternatives Analysis and Recommended Solutions:*** Both structural and non-structural alternatives will be evaluated.
- ***E7: Stakeholder Engagement:*** Stakeholders will weigh in on the recommended alternatives and implementation plan.
- ***E8: Public information.***
- ***E9: Implementation Plan.***

Phase 1: Existing Conditions

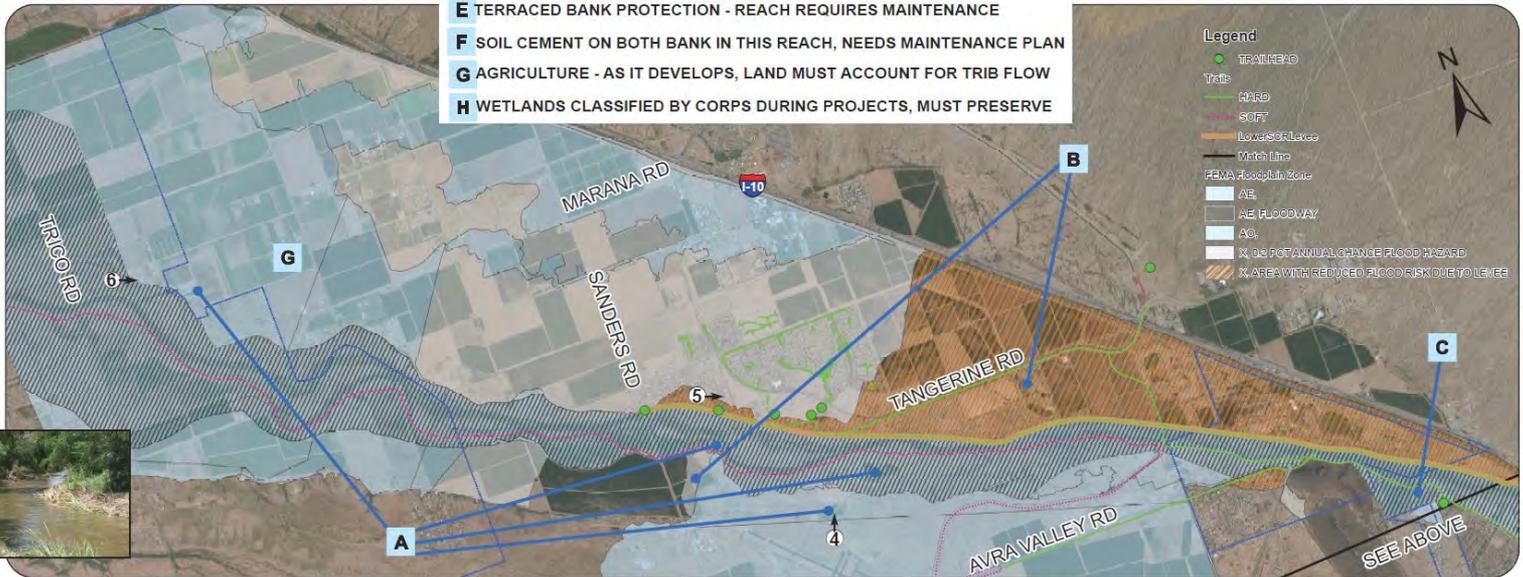
Statement of Qualifications for
**SANTA CRUZ RIVER
 MANAGEMENT PLAN**

Grant Road
 to Trico Road



- A** CONSTRUCTED RECHARGE FACILITIES, MUST BE PROTECTED
- B** EXISTING AND CLOSED LANDFILLS, MUST BE PROTECTED
- C** EL RIO PRESERVE SHOULD BE INCORPORATED INTO THE CORRIDOR PLAN
- D** CORTARO MESQUITE BOSQUE, EXAMPLE OF RESTORATION

- E** TERRACED BANK PROTECTION - REACH REQUIRES MAINTENANCE
- F** SOIL CEMENT ON BOTH BANK IN THIS REACH, NEEDS MAINTENANCE PLAN
- G** AGRICULTURE - AS IT DEVELOPS, LAND MUST ACCOUNT FOR TRIB FLOW
- H** WETLANDS CLASSIFIED BY CORPS DURING PROJECTS, MUST PRESERVE



SOLICITATION NO. 272080
 OCTOBER 17, 2017

ISSUES MAP

Phase 1: Existing Conditions

Flood Hazards are Real



Phase 1: Existing Conditions

August 2006 Storm Photo



Phase 1: Existing Conditions

Effective FEMA floodplain



Phase 1: Existing Conditions

Sharing the Floodplain - Regulations

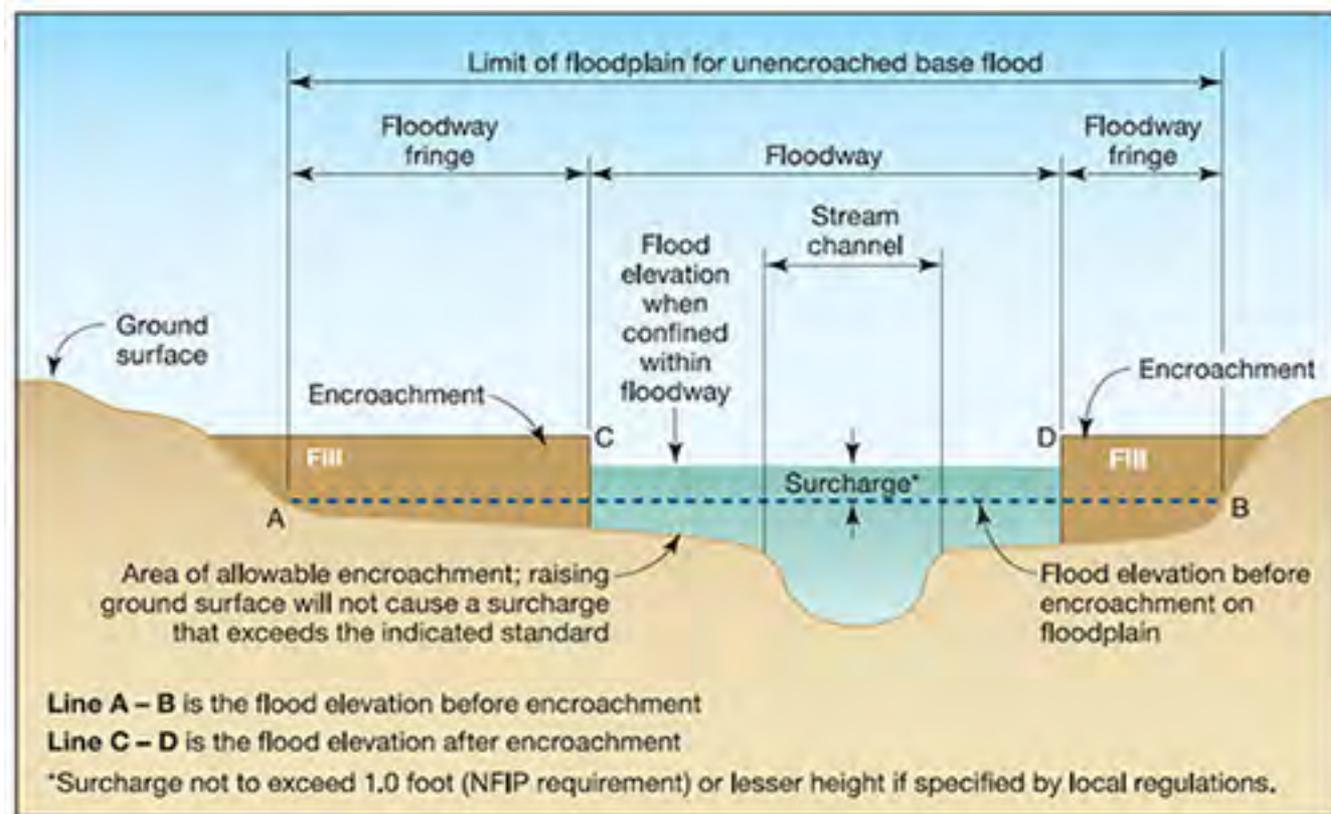
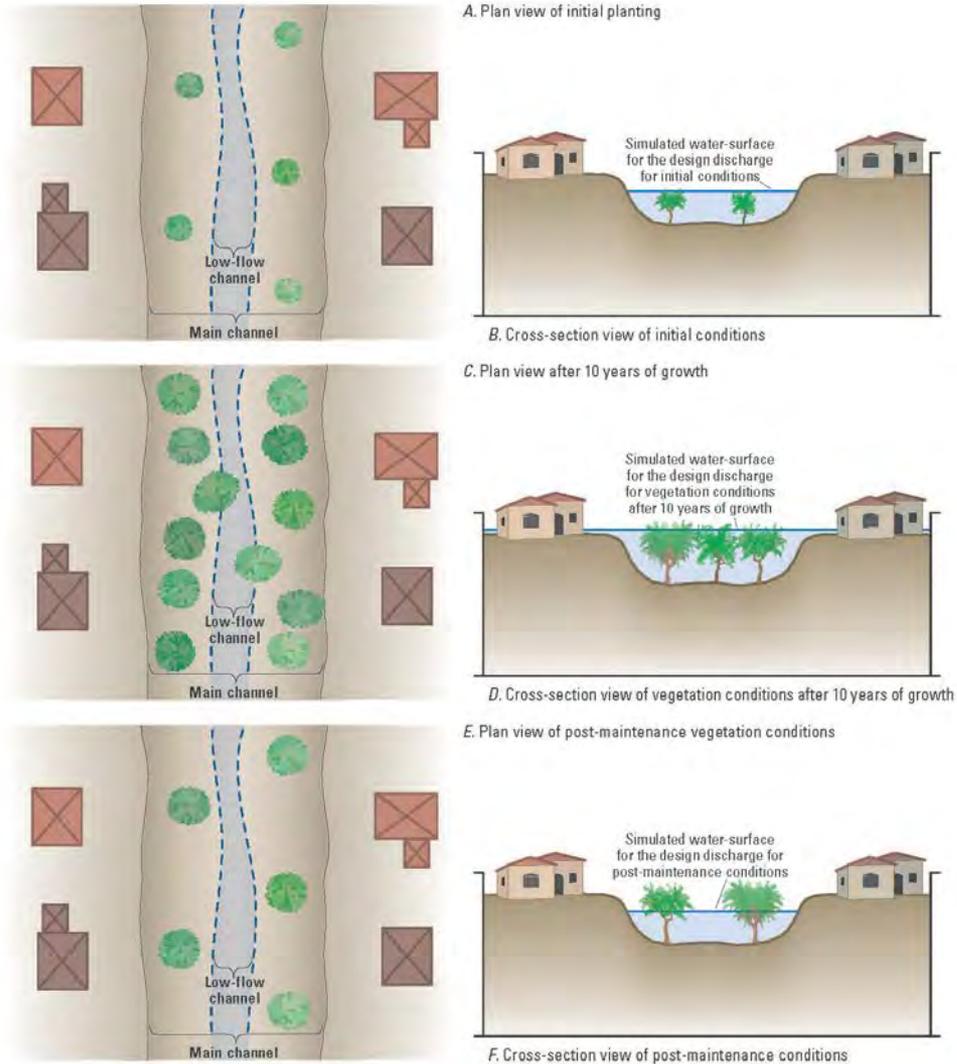


Figure 2-3. Typical riverine floodplain cross section

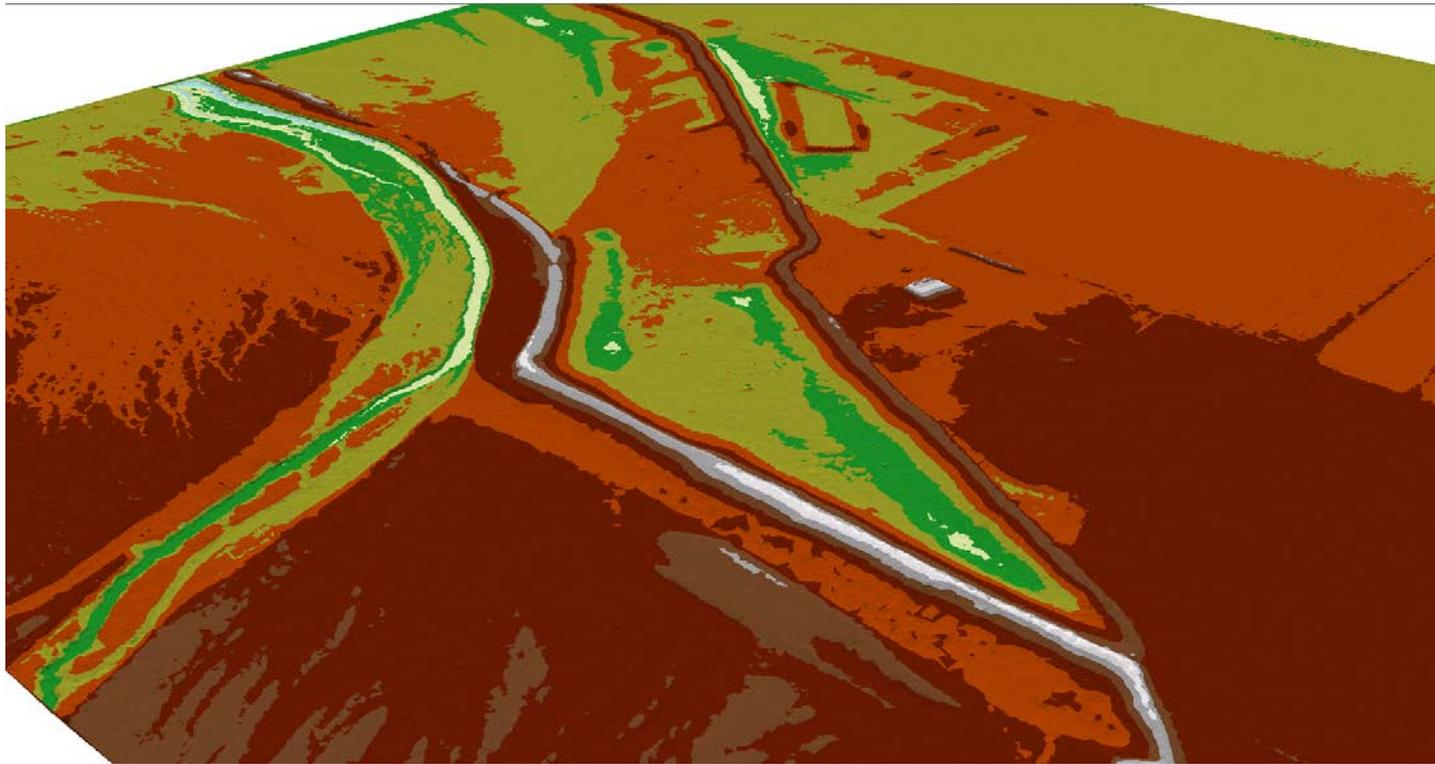
Phase 1: Existing Conditions

Sharing the Floodplain - Parameters



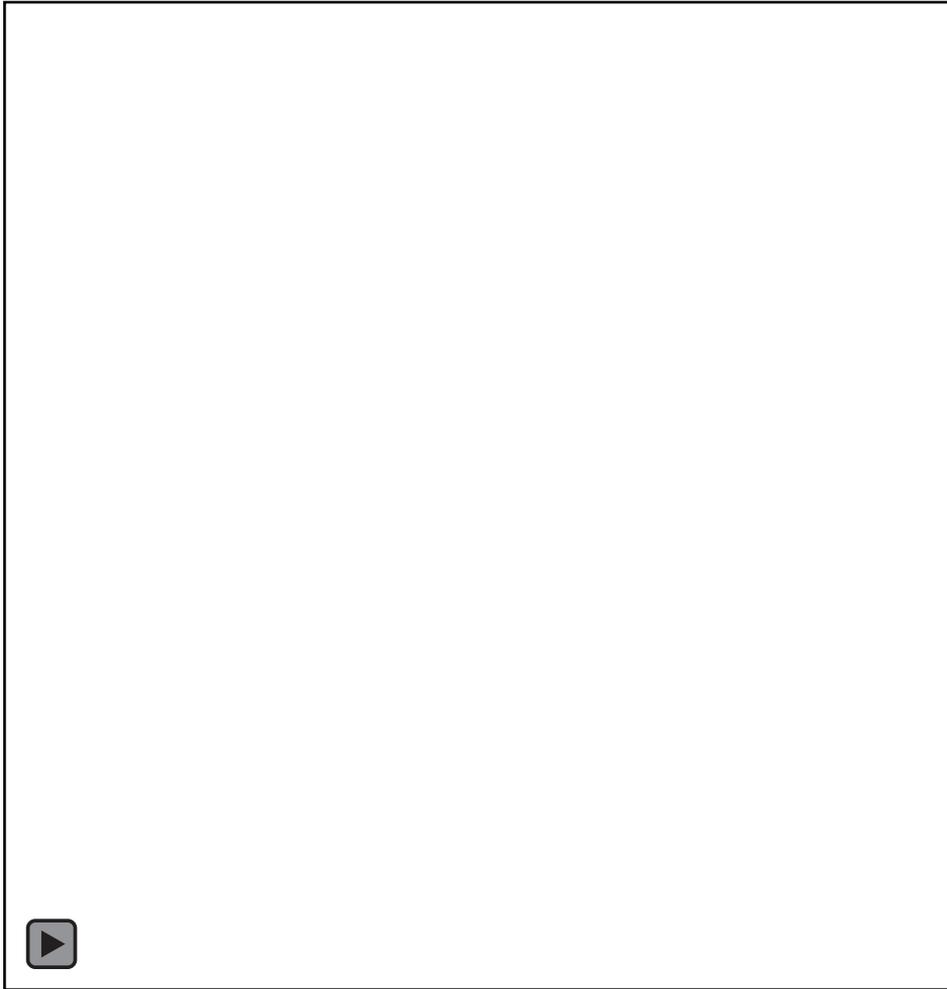
Phase 1: Existing Conditions

Terrain: the foundation for modeling



Phase 1: Existing Conditions

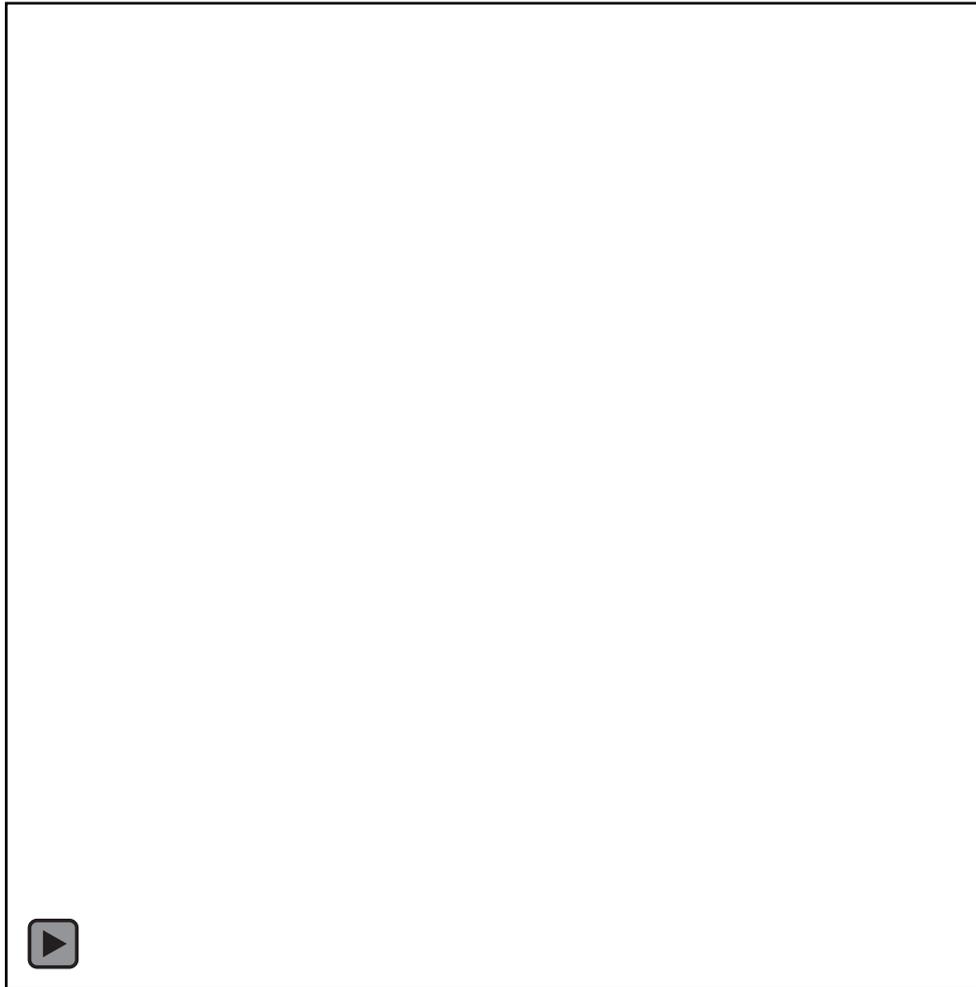
2D Modeling Capabilities



HEC-RAS 2D modeling reflects velocity and flow distribution is more dynamic than what is shown on the current FIRMs

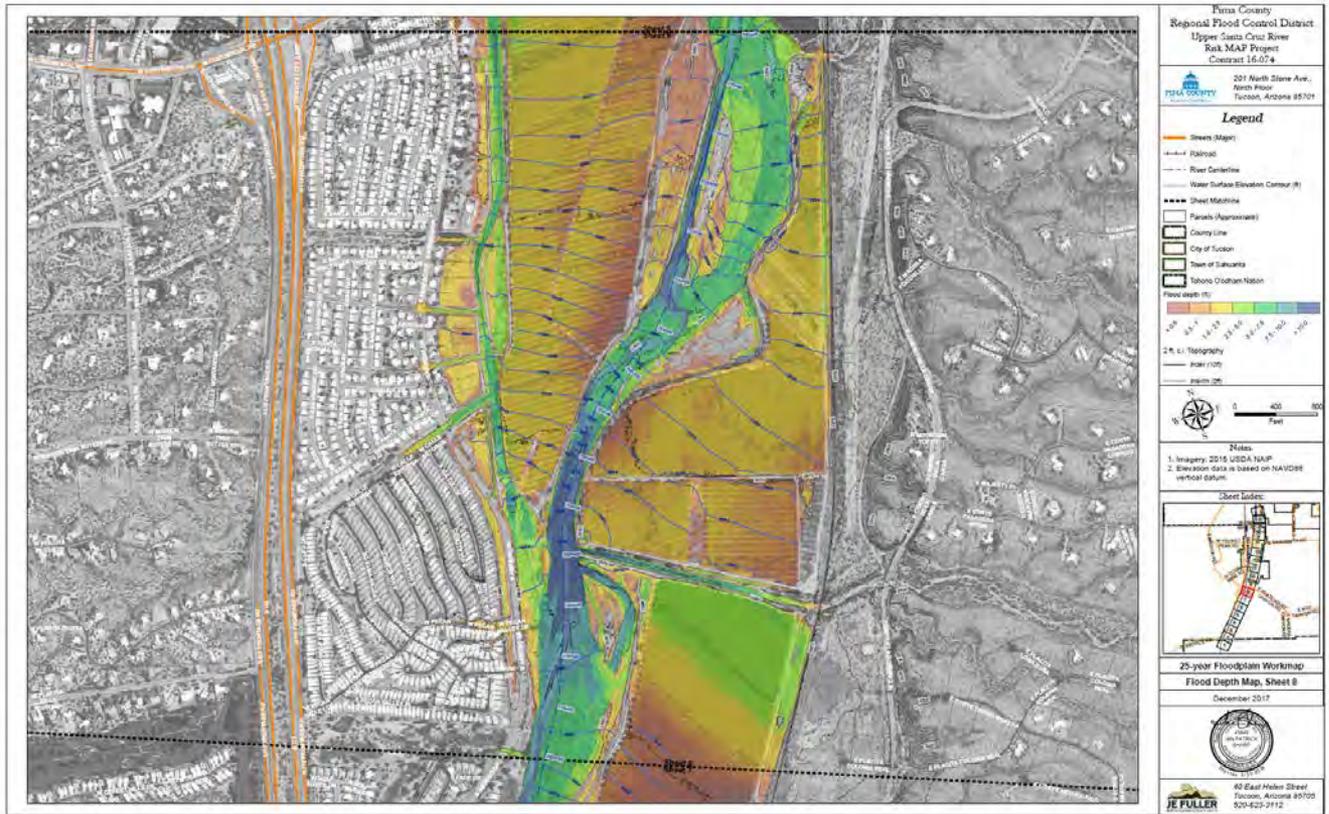
Phase 1: Existing Conditions

2D Modeling Capabilities



HEC-RAS 2D simulation of Santa Cruz River with record flood hydrograph.

Phase 1: Existing Conditions 2D Modeling Capabilities



HEC-RAS 2D
modeling
produces maps
that better
reflect flood risk

Questions?

Phase 1: Existing Condition Stakeholder Comment Form

- Related Ongoing or Future Projects
- Considerations for Phase II of the Study
- Follow-Up Request



Website

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