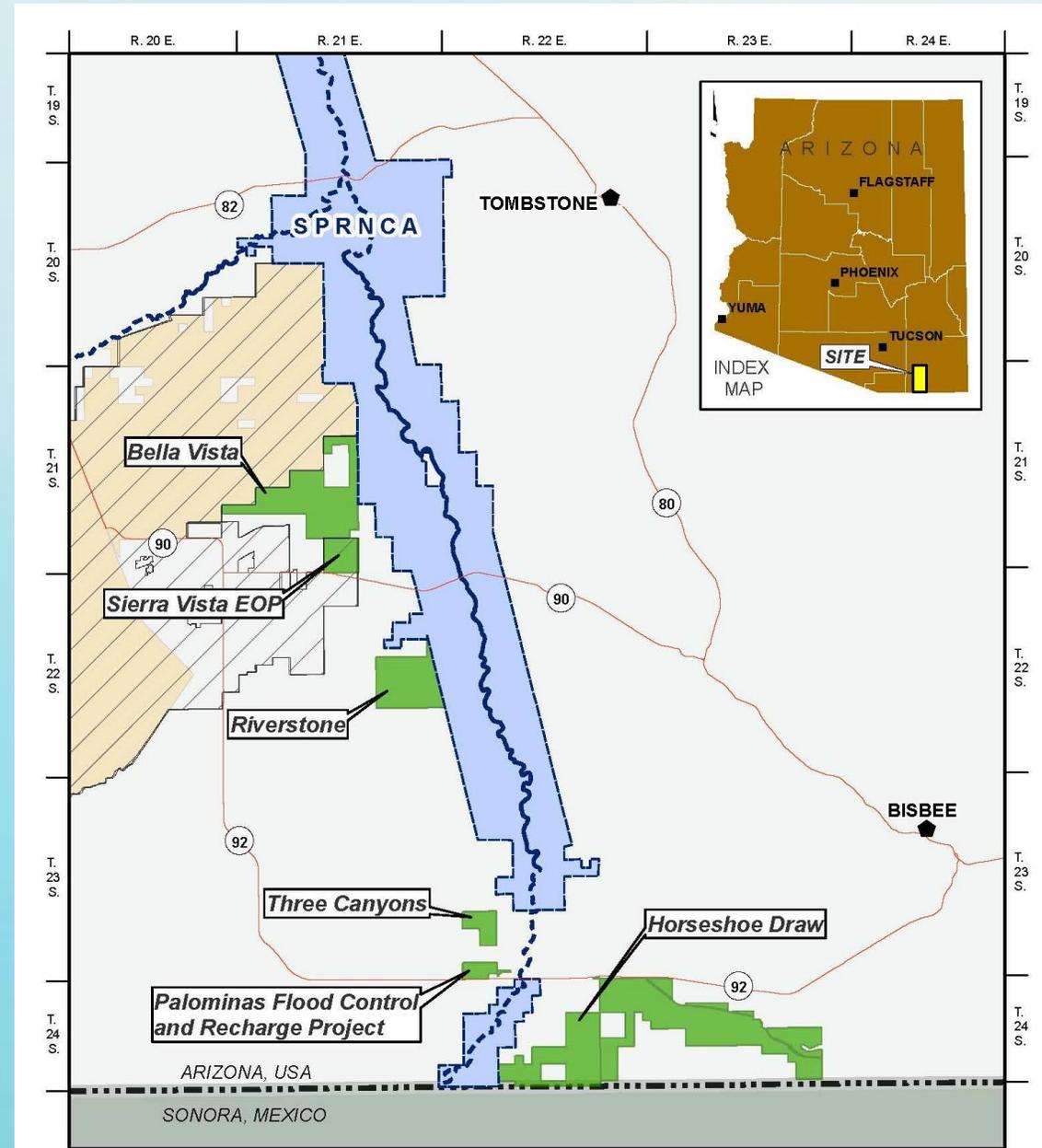


Stormwater Recharge to Benefit the San Pedro River near Sierra Vista, AZ

Presentation to: International Boundary and Water Commission Meeting
March 21 2019

by: Karen C. Riggs
Cochise County Special Projects Engineer

CCRN Project Locations



A Brief History of Cochise County Recharge Projects

- 2011 County awarded \$1.693 Million Walton Family Foundation grant for Palominas Recharge Pilot Project
- 2014 Palominas construction complete & monitoring started
- 2015, 2016, 2017 Preliminary design on Riverstone, Bella Vista and 3 Canyons recharge properties
- 2016 Ephemeral Streamflow & Groundwater monitoring started on other recharge properties
- 2017 County awarded \$550,000 Natural Resources Conservation Service grant for Bella Vista/Coyote Wash recharge project design

Five-Phase Approach to Project Development

- **Phase 1: Initial Investigations and Feasibility Study**
Surface Water Analyses
Near-surface studies to identify optimum recharge site locations
- **Phase 2: Detailed Investigations and Concept Development**
Deeper Subsurface Investigations (Boreholes, Electrical Resistivity)
Concept Site Design
- **Phase 3: Facility Design and Permitting**
Construction Plan Preparation
Permitting
- **Phase 4: Facility Construction**
- **Phase 5: Operations, Maintenance, Monitoring**



NOTE: Aquifer recharge is being prioritized for supporting river baseflows, so iterations with the groundwater model are essential

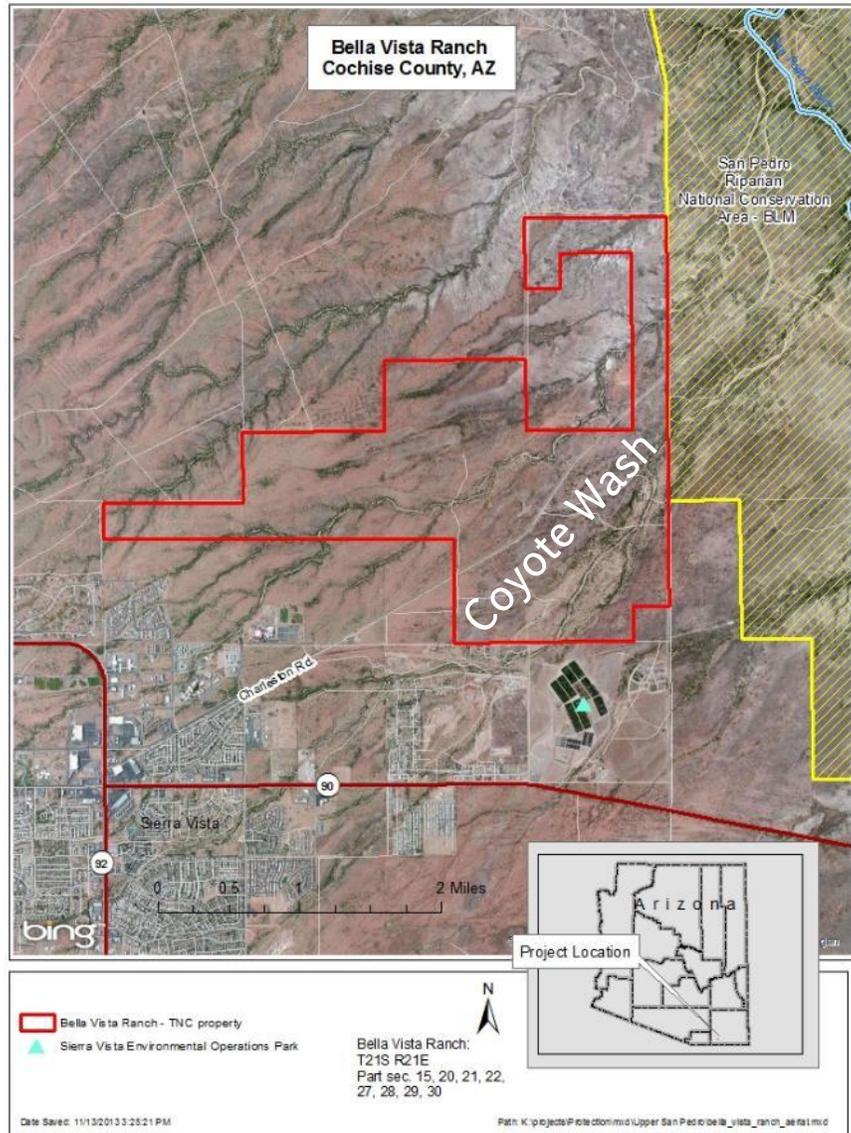
Bella Vista Recharge: Conceptual Design for Urban Enhanced Runoff (UER)

Sierra Vista, AZ

Cochise County owned property

TNC conservation easement

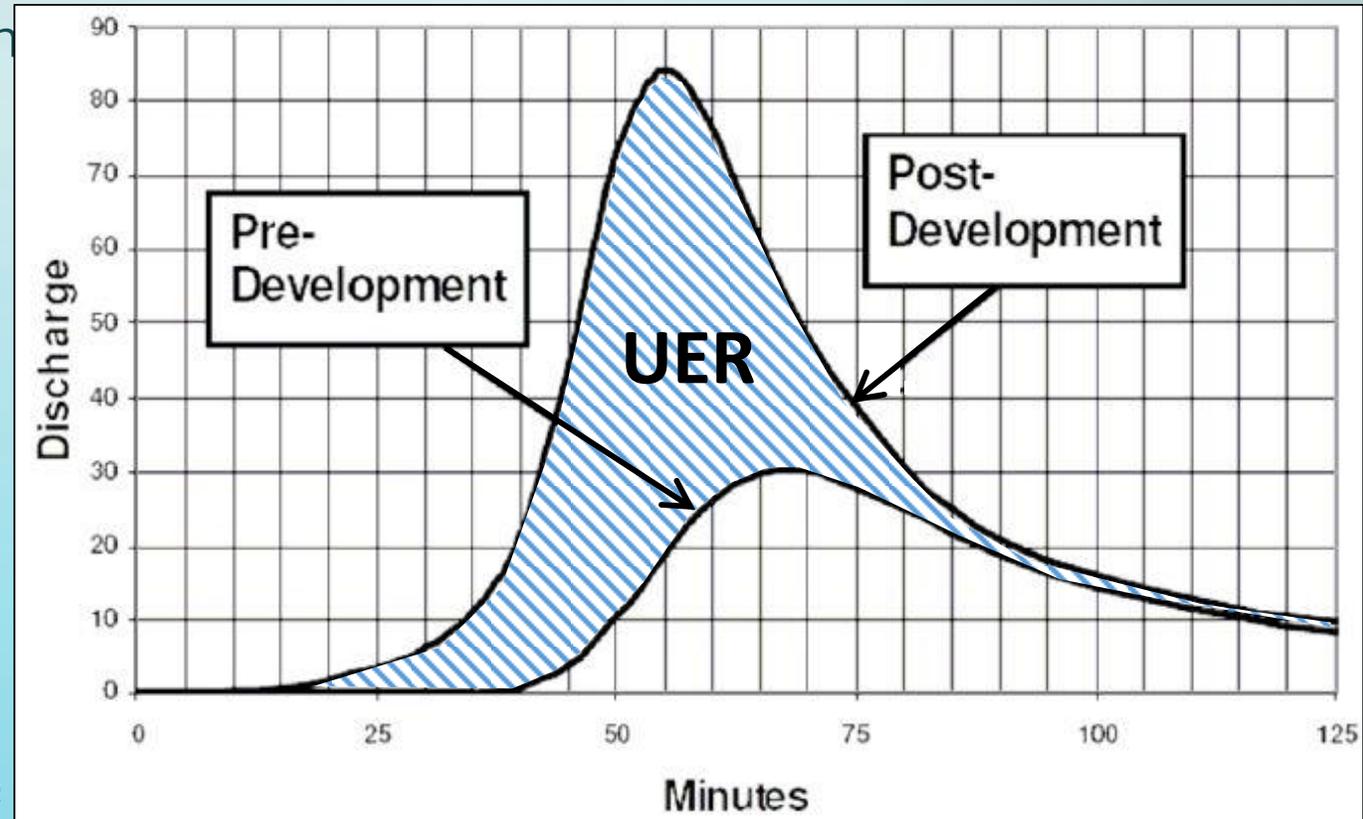
Bella Vista Coyote Wash Recharge Project



- Drains large portion of urbanized Sierra Vista
- Buffer between City and SPRNCA
- EOP groundwater mound lies beneath much of 2900 acre property
- Coyote Wash conveys the most runoff annually from urbanized areas of any drainage in the Sierra Vista Subwatershed
- Recharged UER of 150 acre feet per year is estimated to have a positive effect on the San Pedro River downstream

Key Questions: Bella Vista Coyote Wash UER Recharge

- What is UER?
- How much UER is generated in each
- Where and how can UER be captured?
- Where are sites amenable to groundwater recharge?
- How much UER capture will be/is recharged under a specific design?
- What is the effect on the groundwater aquifer supporting the San Pedro?
- How to leave pre-development flows?



Example of runoff hydrograph under pre-and post-development conditions in Bangalore, India (Adapted from Fig. 12-2 in Ramachandra and Mujumdar, 2009)

Bella Vista Recharge Project Status

- Preparing Watershed Plan and Environmental Assessment at optimal recharge location
- Evaluating preliminary design alternatives.
- Expect to choose a selected alternative this spring
- Then enter full design phase
- Design complete (with bid-ready construction plans) by March 1, 2020

Questions?



Laura Fawcett, 2015



Dennis Donovan, 2014



Laura Fawcett, 2015



Laura Fawcett, 2015