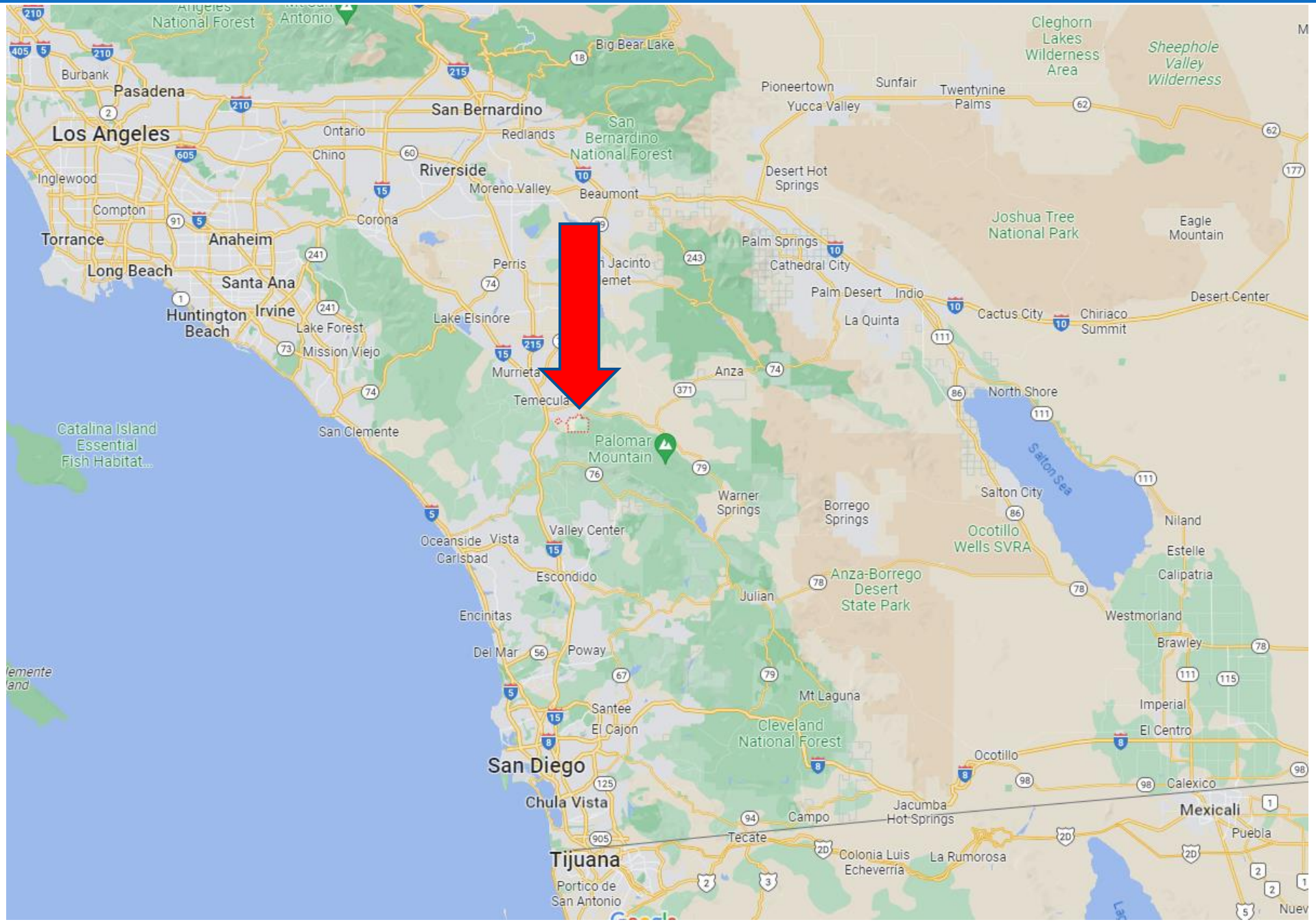
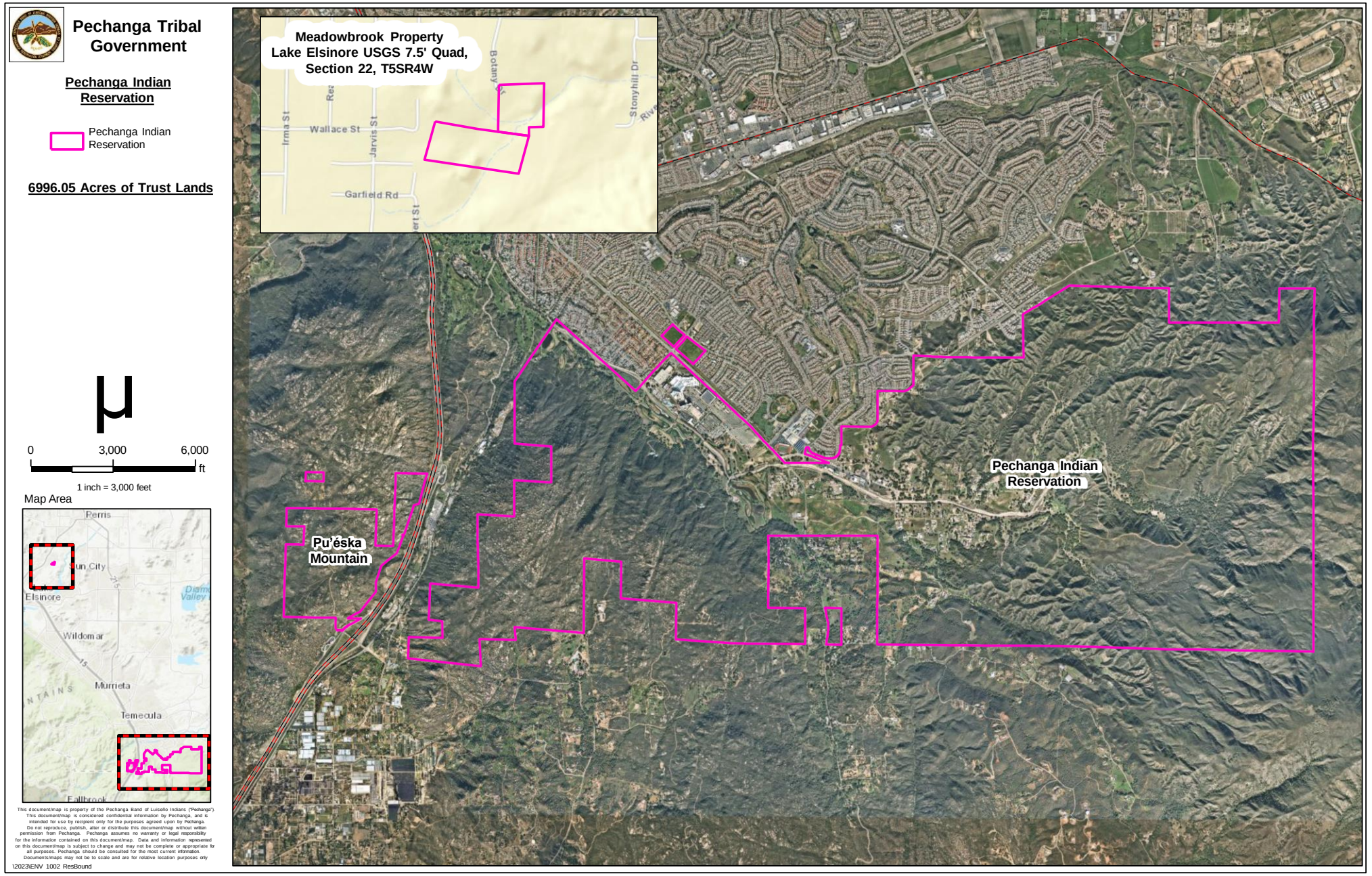
You Inherited a Monitoring Program. What now?

Perspectives of a New Hire


Los Angeles
Pasadena
Burbank
Inglewood
Compton
Torrance
Long Beach
Anaheim
Santa Ana
Huntington Beach
Irvine
Lake Forest
Mission Viejo
San Clemente
Catalina Island Essential Fish Habitat...
San Bernardino
Ontario
Chino
Riverside
Redlands
Big Bear Lake
San Bernardino National Forest
Moreno Valley
Beaumont
Corona
Perris
Lake Elsinore
Murrieta
Temecula
Anza
Palomar Mountain
Warner Springs
Borrego Springs
Valley Center
Oceanside
Carlsbad
Vista
Escondido
Encinitas
Del Mar
Poway
Julian
Anza-Borrego Desert State Park
Santee
El Cajon
Mt Laguna
Cleveland National Forest
San Diego
Chula Vista
Tijuana
Portico de San Antonio
Campo
Tecate
Jacumba Hot Springs
Colonia Luis Echeverría
La Rumorosa
Ocotillo
Ocotillo Wells SVRA
Salton Sea
Salton City
North Shore
Desert Hot Springs
Palm Springs
Cathedral City
Palm Desert
Indio
La Quinta
Cactus City
Chiriaco Summit
Desert Center
Joshua Tree National Park
Eagle Mountain
Pioneertown
Yucca Valley
Sunfair
Twentynine Palms
Cleghorn Lakes Wilderness Area
Sheephole Valley Wilderness
Niland
Estelle
Calipatria
Westmorland
Brawley
Imperial
El Centro
Calexico
Mexicali
Puebla


Pechanga Tribal Government
Pechanga Indian Reservation
Pechanga Indian Reservation
6996.05 Acres of Trust Lands
0
3,000
6,000
ft
1 inch = 3,000 feet
Map Area
Perris
Elsinore
Wildomar
Murrieta
Temecula
Fallbrook
Meadowbrook Property
Lake Elsinore USGS 7.5' Quad,
Section 22, T5SR4W
Wallace St
Garfield Rd
Stonyhill Dr
Pu'éska Mountain
Pechanga Indian Reservation
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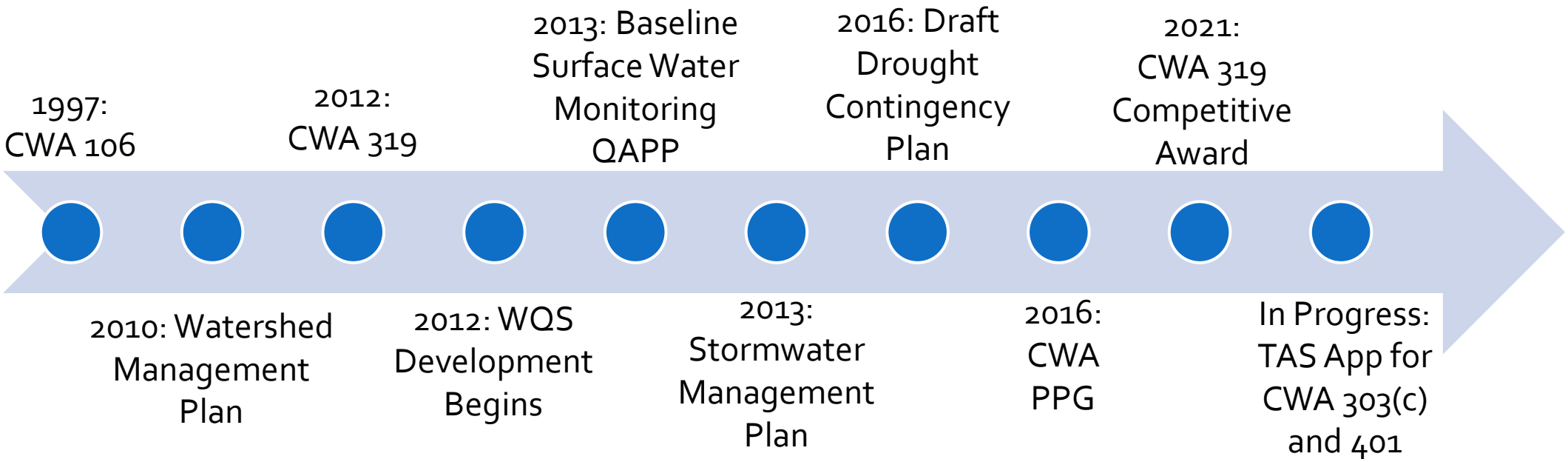
\2023\ENV 1002 ResBound

Pechanga Water Program Timeline



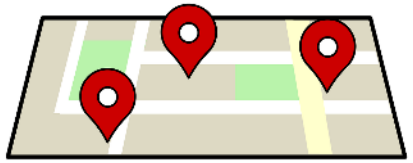
Funding

- Performance Partnership Grant (PPG)
  - CWA 106
  - CWA 319 Base
  - CWA 319 Competitive
- USEPA Wetlands Grant

Questions

- What is the history of the program? What are we doing now? What are goals for the future?
- What are we measuring and why? Are certain results indicative of something?
- What do we do if we get alarming results? Is there a response chain of command?
- What are our SOPs? Must our sampling be conducted in a particular way?
- What are Tribal goals for water quality standards?
- What capacity is available to run the program? Do changes need to be made for program development?

Surface Water Monitoring Snapshot



Monitoring Strategy – where, when, how, why

Sampling Schedule – monthly, quarterly, seasonal

QAPP – it's your rulebook… you **MUST** follow it.

Reporting – quarterly, semiannual, annually

SURFACE WATER MONITORING

Dipping a toe in the water…

Monitoring Devices

https://www.ysi.com/customer-support/software-firmware-downloads/software

Search

Kor Software - v1.2.18.0

KorEXO Software - v2.3.10.0

KorDSS Software - v1.7.4.0

KorDSS Software - v1.7.4.0
Includes ProDSS instrument firmware v1.2.10
Nov 2019

Desktop software and instrument firmware for the ProDSS.

Note: Versions of KorDSS older than 1.4.0.24 must be ***uninstalled*** before installing v1.7.4.0. Please see the Update Notice below for more information.

It is ***strongly recommended*** to update KorDSS to v1.7.4.0, as it features support for all released probe/cable assemblies. This version of KorDSS must be used when updating ProDSS instrument firmware to v1.2.10.

Update Notice & Instructions [PDF]

Download KorDSS [196 MB]

Sampling Supplies

- YSI Pro DSS handheld flow meter
- Kestrel
- Nitrile gloves
- Dip cup
- Sample containers
- Sample container labels
- Disinfectant
- Deionized Water
- Ice packs
- Cooler
- Field data sheets
- Pens
- Pencils
- Field book
- Emergency supplies (first aid, radio, etc.)

Pechanga Environmental Department off-road vehicle purchased with CWA funding.

Quarterly Monitoring

Left: Environmental Program Coordinator D. Newman pouring water from the dip cup into sampling container held by intern T. Orosco

Right: Environmental Technician M. Poffinbarger preparing YSI Pro DSS for deployment with specimen collection supplies in foreground on boulder

Constituents Measured via Probe

Physical Constituents	Method	Reporting Limit	Units
Turbidity	Probe/Meter	0 to 1,000	NTU
pH	Probe/Meter	0 to 14	pH units
Conductivity	Probe/Meter	0 to 100	mS/cm
Specific conductance	Probe/Meter	0 - 100	mS/cm
Temperature	Probe/Meter	-5° to + 50°	C
Oxygen reduction potential (ORP/Redox)	Probe/Meter	-999 to +999	mV
Flow	Probe/Meter		cfs

Constituents Measured via Sampling

Microbiological Constituents	Method	Reporting Limit	Units
Enterococci	SM 9230C	1.0	CFU/100 mL
Total Coliform	SM 9221B	2.0	MPN/100 mL
Escherichia coli (E.coli)	SM 9221E/F	2.0	MPN/100 mL

CFU: Colony Forming Unit
MPN: Most Probable Number

Constituents Measured via Sampling

Inorganic Nonmetallic, Metalloid Constituents	Method	Reporting Limit	Units
Dissolved Oxygen (DO)	Probe/Meter	0 to 50	mg/L
Total Kjedldehl Nitrogen (TKN)	EPA 351.2	0.1	mg/L
Nitrite (NO^-_2)	SM 4500NO_2B	0.2	mg/L
Nitrate (NO^-_3)	EPA 300.0	0.05	mg/L
Ammonia (NH_3)	SM 4500-NH_3H	0.1	mg/L
Phosphorous, total (P)	SM 4500-PBE	0.05	mg/L

Potential Constituents

Constituent
Physical
Alkalinity
Color
Turbidity
pH
Hardness
Conductivity
Specific conductance
Salinity
Temperature
Oxygen reduction potential (ORP/Redox)
Total dissolved solids (TDS)
Total suspended solids (TSS)
Flow

Constituent
Aggregate Organic
Biochemical oxygen demand (BOD)
Total organic carbon (TOC)
Methylene blue active substances (MBAS)
Microbiological
E.coli
Enterococci
Total Coliform
Inorganic Nonmetallic, Metalloids
Arsenic (As)
Boron (B)
Chloride (Cl^-)
Fluoride (F)

Constituent
Total Kjedldehl Nitrogen (TKN)
Nitrite (NO^-_2)
Nitrate (NO^-_3)
Ammonia (NH_3)
Dissolved Oxygen (DO)
Phosphorous, total (P)
Selenium (Se)
Sulfate (SO_4)
Silica (SiO_2)
Carbonate (CO_3^{-2})
Bicarbonate (HCO_3^-)
Metals
Aluminum (Al)
Cadmium (Cd)

Constituent
Chromium (Cr)
Calcium (Ca)
Copper (Cu)
Iron (Fe)
Lead (Pb)
Magnesium (Mg)
Manganese (Mn)
Potassium (K)
Sodium (Na)

Laboratory Analysis- In or Out?

Time?

Money?

Staff Hours?

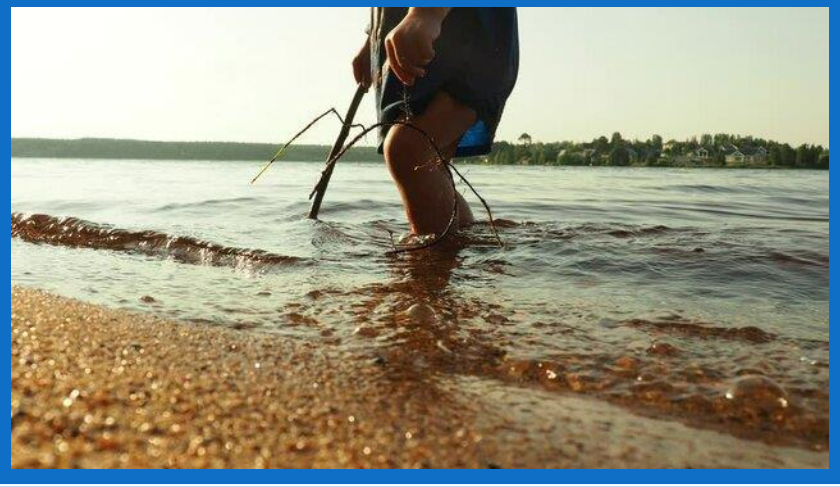
Lab Space?

Transportation?

Tribal Sovereignty?

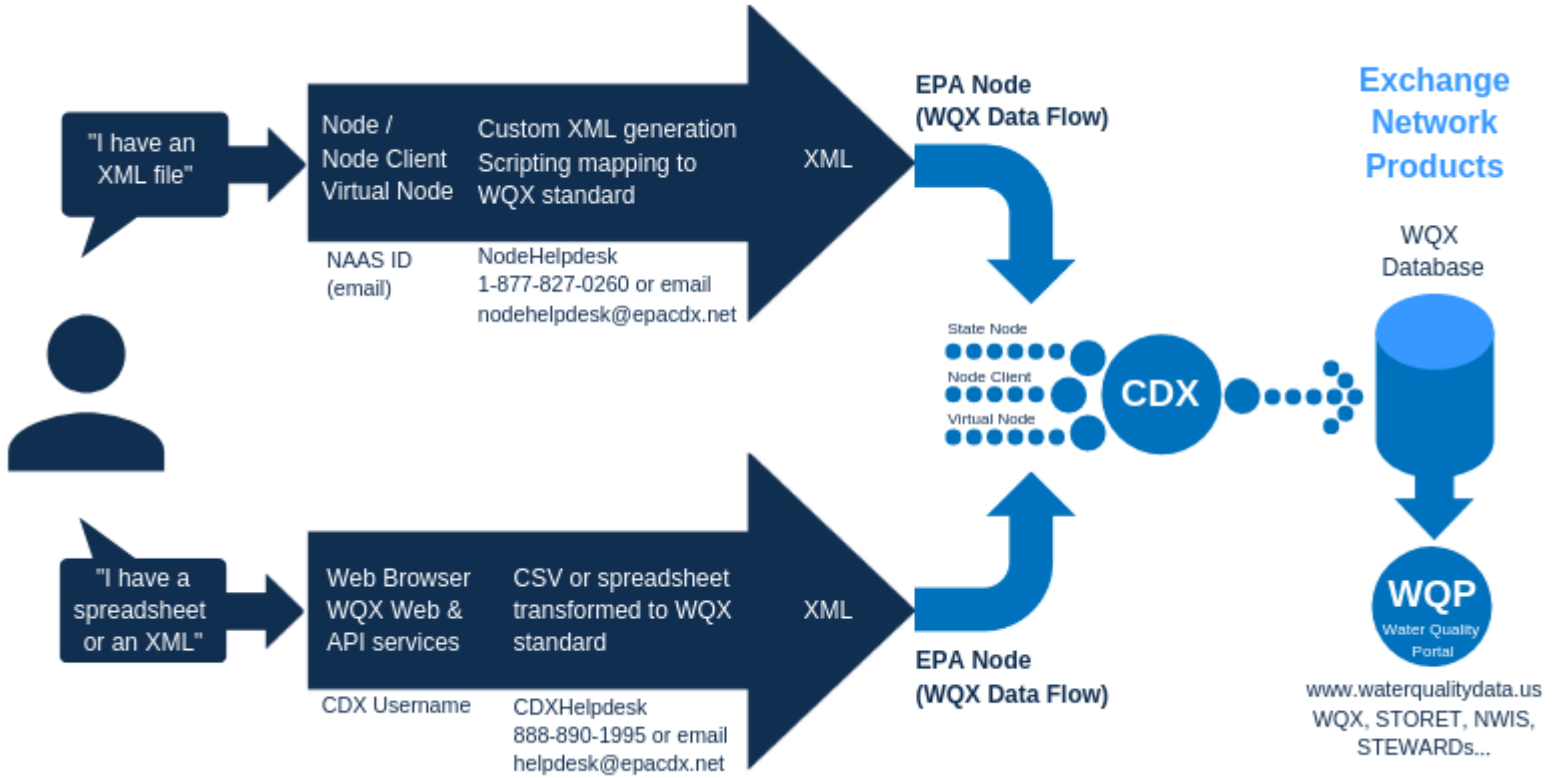
DATA & BMI SAMPLING

Ankle deep…



Data Reporting *in development

- Databases:
  - Central Data Exchange (CDX) https://cdx.epa.gov/
    - Water Quality Exchange (WQX)
- Submission Tools:
  - Water Quality Exchange (WQX) Web https://www.epa.gov/waterdata/wqx-web-account-registration
  - Ambient Water Quality Monitoring System (AWQMS)

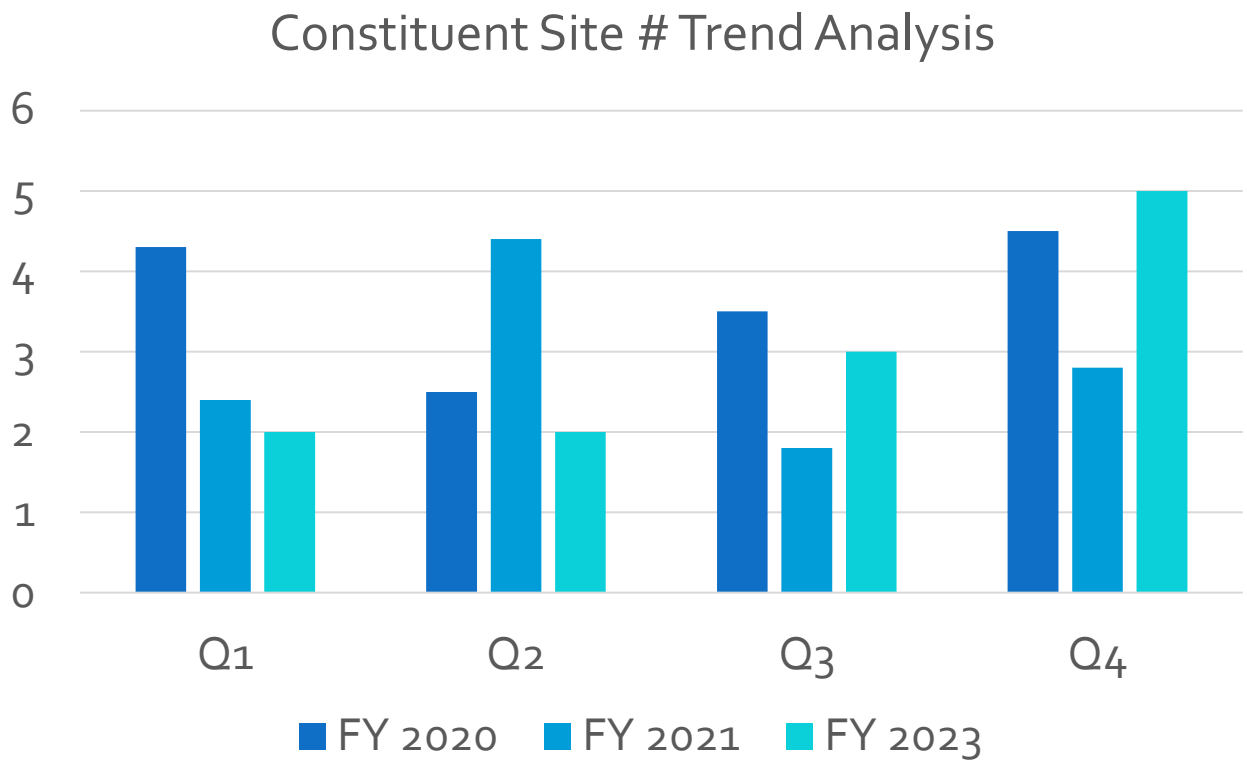


AWQMS

Ambient Water Quality Monitoring System

Data Analysis *in development

- Water quality constituent trends over time at particular monitoring sites



SWAMP

Bottom of the reach looking upstream.

Bottom of the reach looking downstream.

SWAMP

D. Newman examining streambed substrate

D. Newman measuring bankfull width of stream

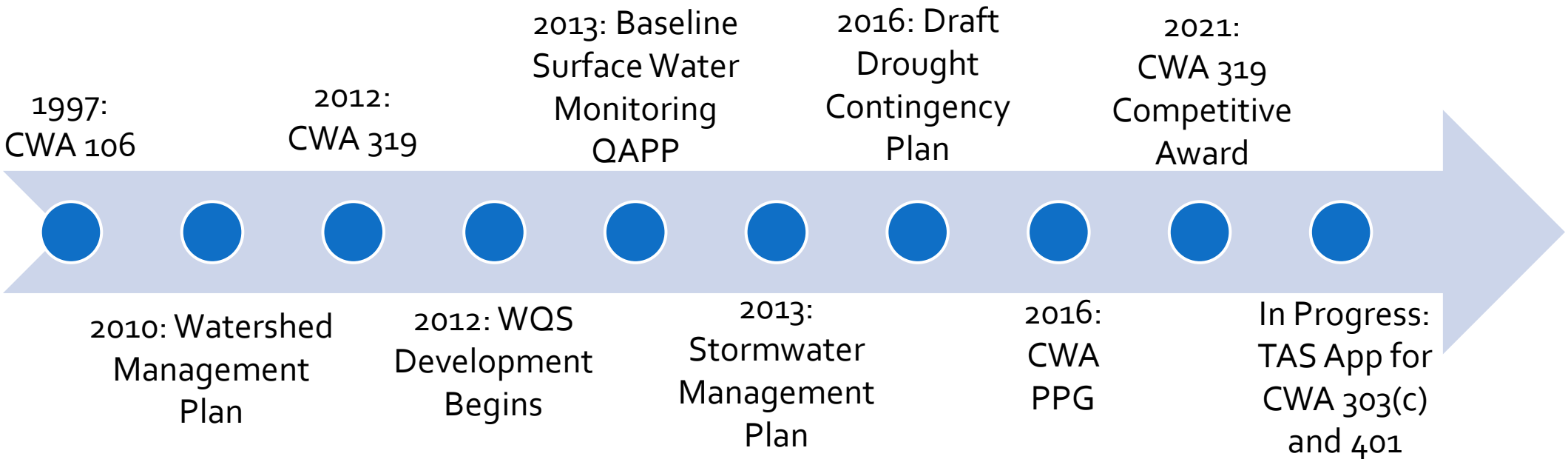
EVERYTHING ELSE

Diving all the way in…

Key Documents

- QAPP
- Work Plan
- Field Data Sheets
- Report Templates
- Wellhead Protection Program (WhPP)
- Non-Point Source Management Program under Section 319 of the CWA
- Pechanga Watershed Management Plan (PWMP) to support development of water quality standards

Pechanga Water Program Timeline



A Sample of Options for Program Expansion

- Establishing Treatment as a State (TAS)
  - Enforcement capacity?
- Defining Water Quality Standards (WQS)
  - Strength of standards?
- Stormwater monitoring
- Wetland monitoring and management

Stormwater Monitoring

Pechanga Creek post rain event.

Pechanga Creek flowing during rain event.

CASQA

The California Stormwater Quality Association (CASQA) is a professional member association that advances sustainable stormwater management protective of California water resources.

Environmental Technician M. Poffinbarger

Environmental Program Coordinator D. Newman

CRAM

CRAM

Students at the 3-day specialty Vernal Pool assessment course.

Vernal Pool at the San Diego Wildlife Refuge.

Conferences and Training

- Tribal:
  - Stream Team
  - TLEF (Tribal Lands and Environment Forum) by ITEP (Institute for Tribal Environmental Professionals)
  - AWQMS (by GS Elements and NAEPC (Native American Environmental Protection Coalition))
- State-specific:
  - SWAMP (Surface Water Ambient Monitoring Program by the California Water Boards)
  - CRAM Wetlands (California Rapid Assessment Method for Wetlands by the San Francisco Estuary Institute and Aquatic Science Center)
    - Tribal Program in the works
  - CASQA Annual Conference (California Stormwater Quality Association)
- Federal / national:
  - **USEPA Watershed Academy**
  - Storm Con

Contact Information

Megan Poffinbarger

Environmental Technician

mpoffinbarger@pechanga-nsn.gov

(951) 770-6152

Instagram: @Pechanga_environmental