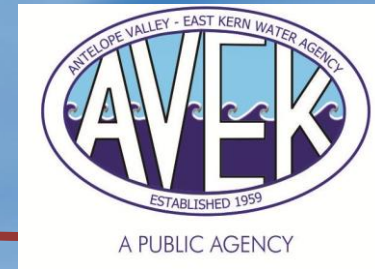


**Kennedy/Jenks Consultants**



**Grand Prize – Environmental Sustainability  
Kennedy Jenks Consultants and AECOM  
Antelope Valley-East Kern Water Agency  
(AVEK) – Westside Water Bank**

**Michael Flood, P.E.**

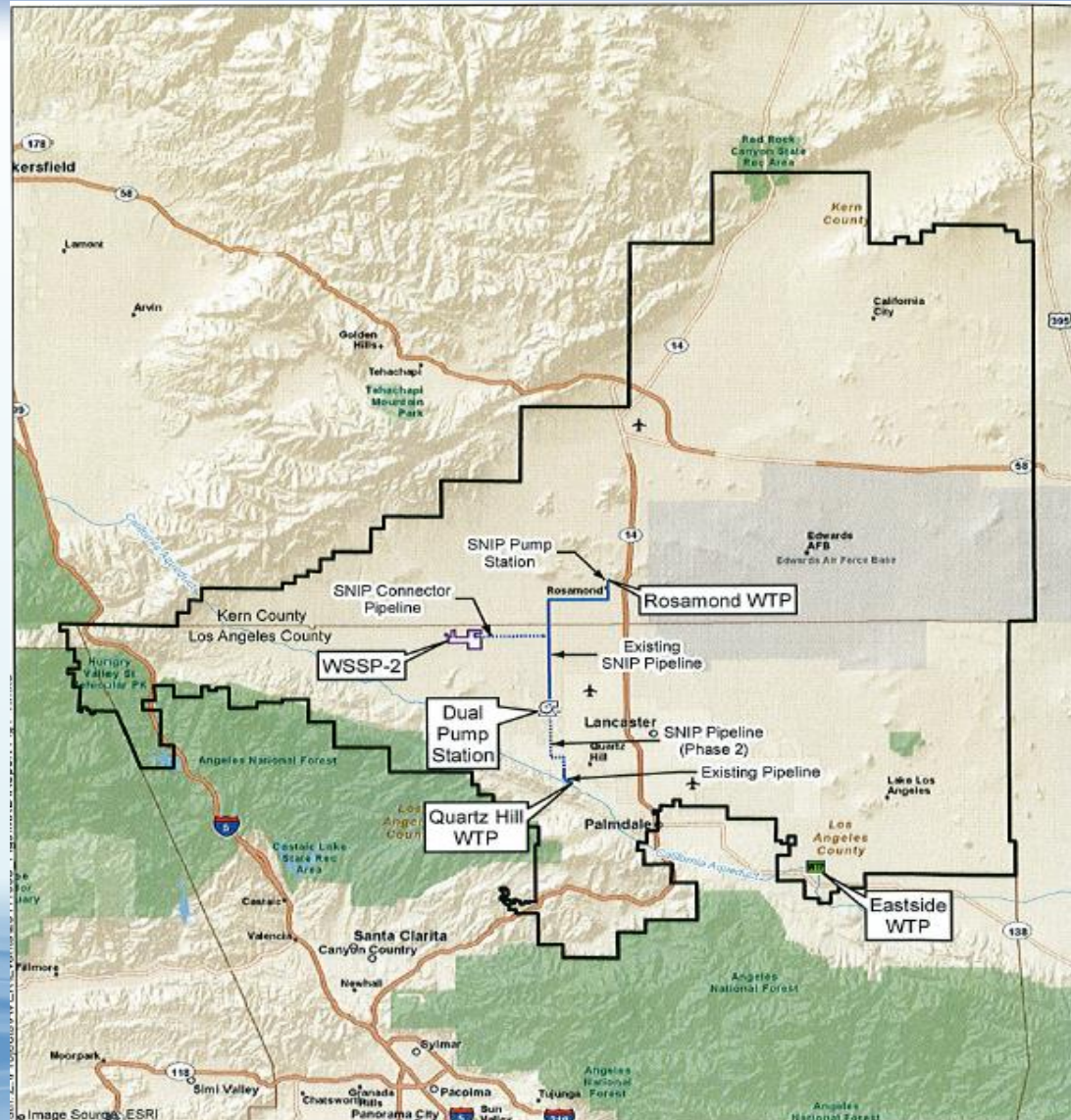
**David Ferguson, Ph.D., P.E., BCEE**

# Presentation Overview

- **AVEK Service Area**
- **Water Supply**
- **Water Banking Strategy**
  - **Water Supply Stabilization**
  - **THM Compliance**
- **Recharge Approach**
- **Extraction Wells and Conveyance**
- **2014 Results**

# AVEK Service Area

- Wholesale supplier
- 2,300 square miles
- Los Angeles and Kern Counties, CA
  - Mojave Desert area
  - Edwards Air Force Base
- 20+ municipal retailers, agricultural, and industrial users





# Water Supply

- **CA State Water Project Contractor**
  - 144,800 AFY Table A Allocation
  - 60,000 AFY average demand
- **SWP highly variable**
  - 5% to 80+% allocations
  - Average 58%
- **Groundwater basin is currently in an adjudication process**



# Water Bank Strategy

## ■ Water Supply Stabilization

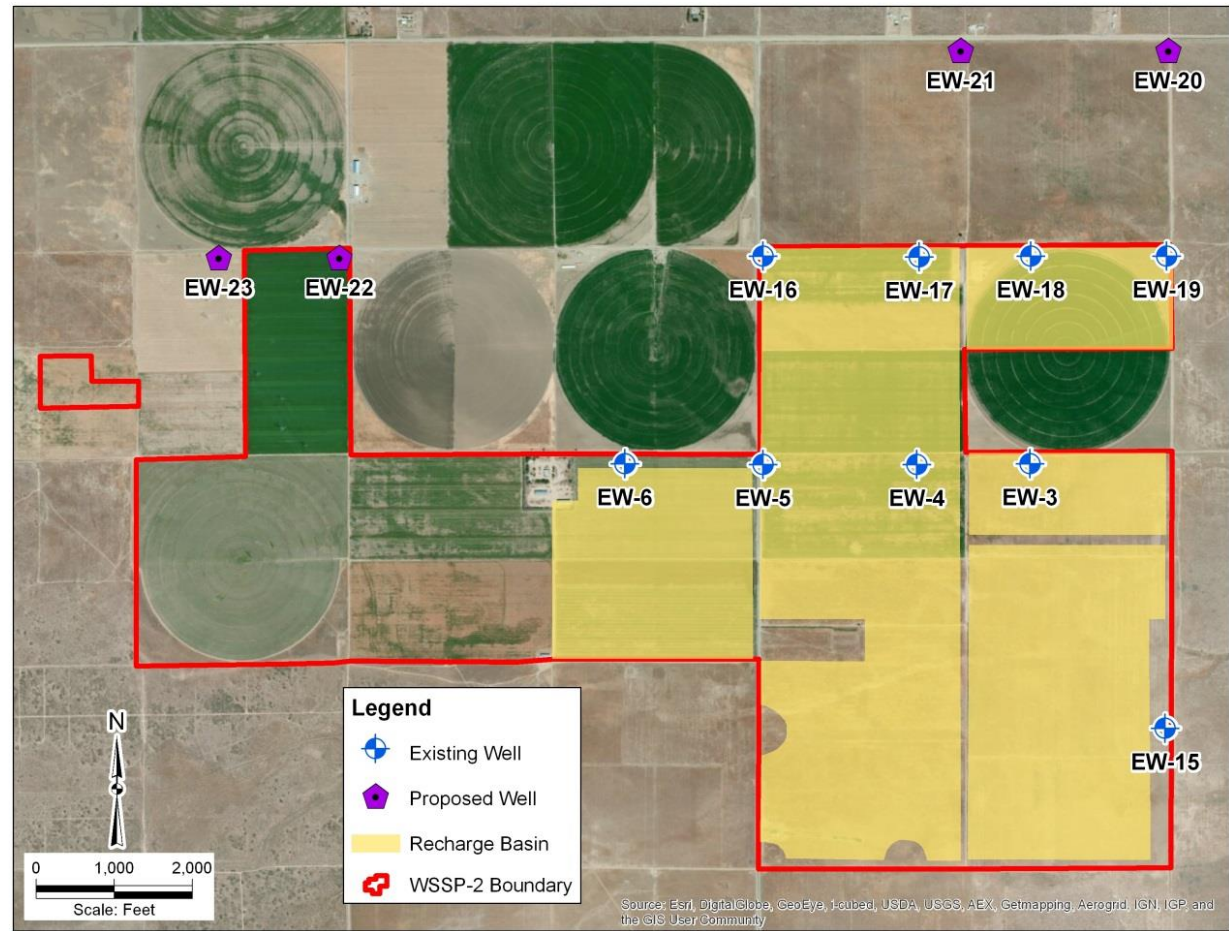
- Bank surplus SWP water during wet and normal years and extract the banked water during dry years

## ■ THM Compliance

- Substitute SWP treated water with extracted (low TOC) groundwater for one quarter out of the year
- Blend the SWP treated water with 50 to 70% groundwater for multiple quarters

# Water Bank Layout

- 1,500 ac property
- Recharge up to 50,000 Ac-Ft/year
- Extract 90% of recharged water:
  - Phase 1 – 20,000 Ac-Ft/year
  - Phase 2 – 40,000 Ac-Ft/year





# Turnouts with Above-Ground Piping



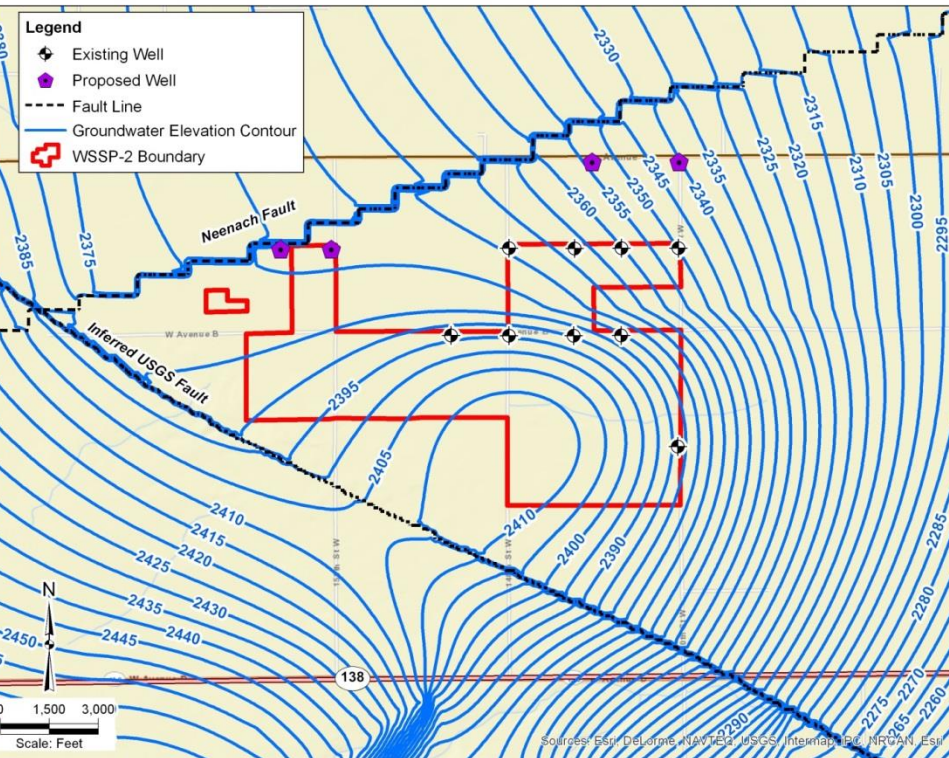
# Low-berm Flooding of Agricultural Fields



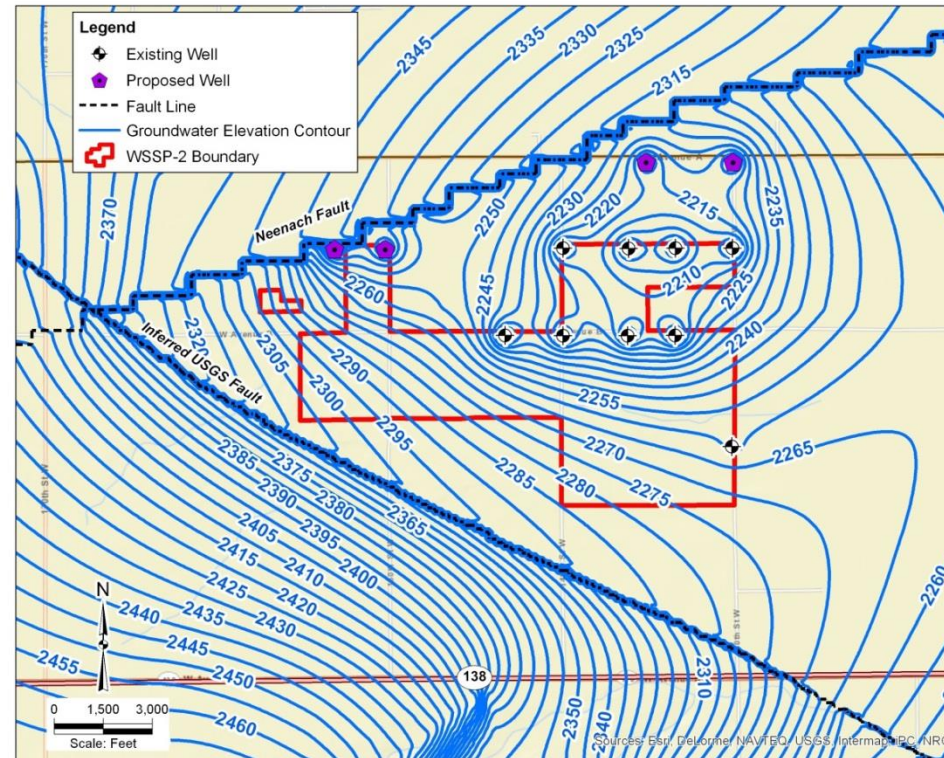


# Sub-regional Groundwater Model

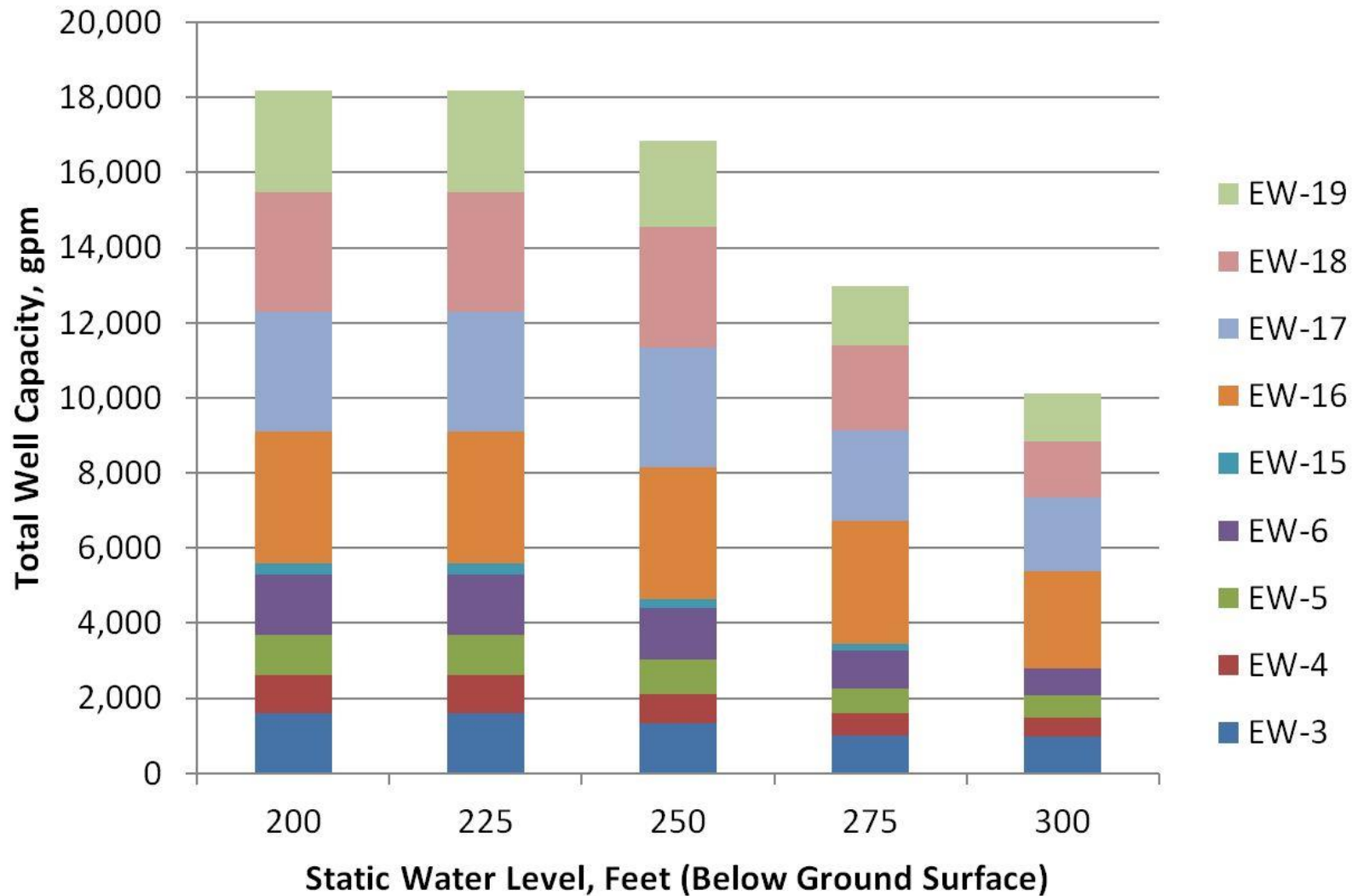
## Maximum Mounding



## Maximum Drawdown



# Well Capacity – Varies with Static Water Level





# Well Drilling





# Extraction Wells: 50 to 400 HP





# Construction in 2013



On-line January 2014



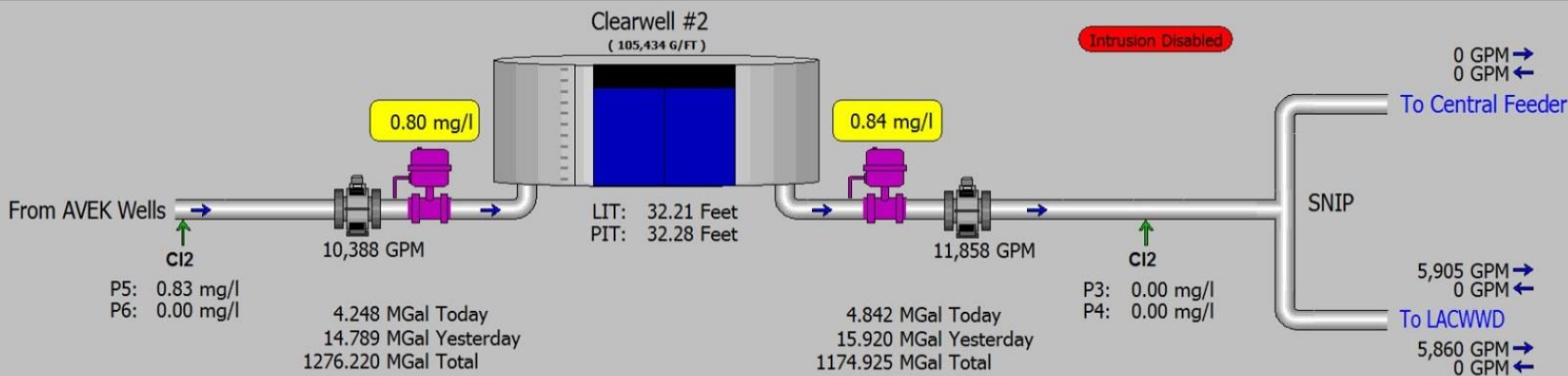
11/19/2014 13:11



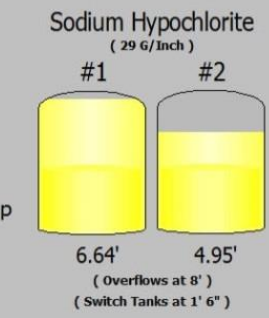
# Chlorination System: Sized for 50 mgd



# Control and Automation



	Well #3	Well #4	Well #5	Well #6	Well #15	Well #16	Well #17	Well #18	Well #19	Well Total
MGal Total	51.03	25.65	24.62	49.99	0.00	360.63	275.73	50.97	176.01	11,211 GPM
Flow (GPM)	988	607	619	727	0	2605	2117	1998	1561	
Speed (Hz)	55.0	54.0	52.5	53.1	0.0	59.4	59.1	57.4	55.3	
Pressure (PSI)	15.7	12.4	12.6	10.6	0.0	10.6	13.2	15.8	19.3	
Well Level (Ft)	22	25	14	40	-350	50	20	37	23	
Inline Valve	●	●	●	●	Not Auto	●	●	●	●	
Waste Valve	●	●	●	●	Not Auto	●	●	●	Not Auto	



Date	Time	Name	Comment	State	Value	Limit
06/15	06:59:48	W15COMM	Well 16 Comm Fail	UNACK_RTN	OK	FAIL
06/13	06:45:11	W15COMM	ACK All	ACK	FAIL	FAIL

**ACK Selected** **Alarm Summary**

# 2014 Results

- **Saved the Day during 2014 Drought!**
  - Produced 15,000 Ac-Ft
  - Nearly 50% of 2014 supply
- **Excellent water quality**
  - Low distribution system THMs



# Q & A

