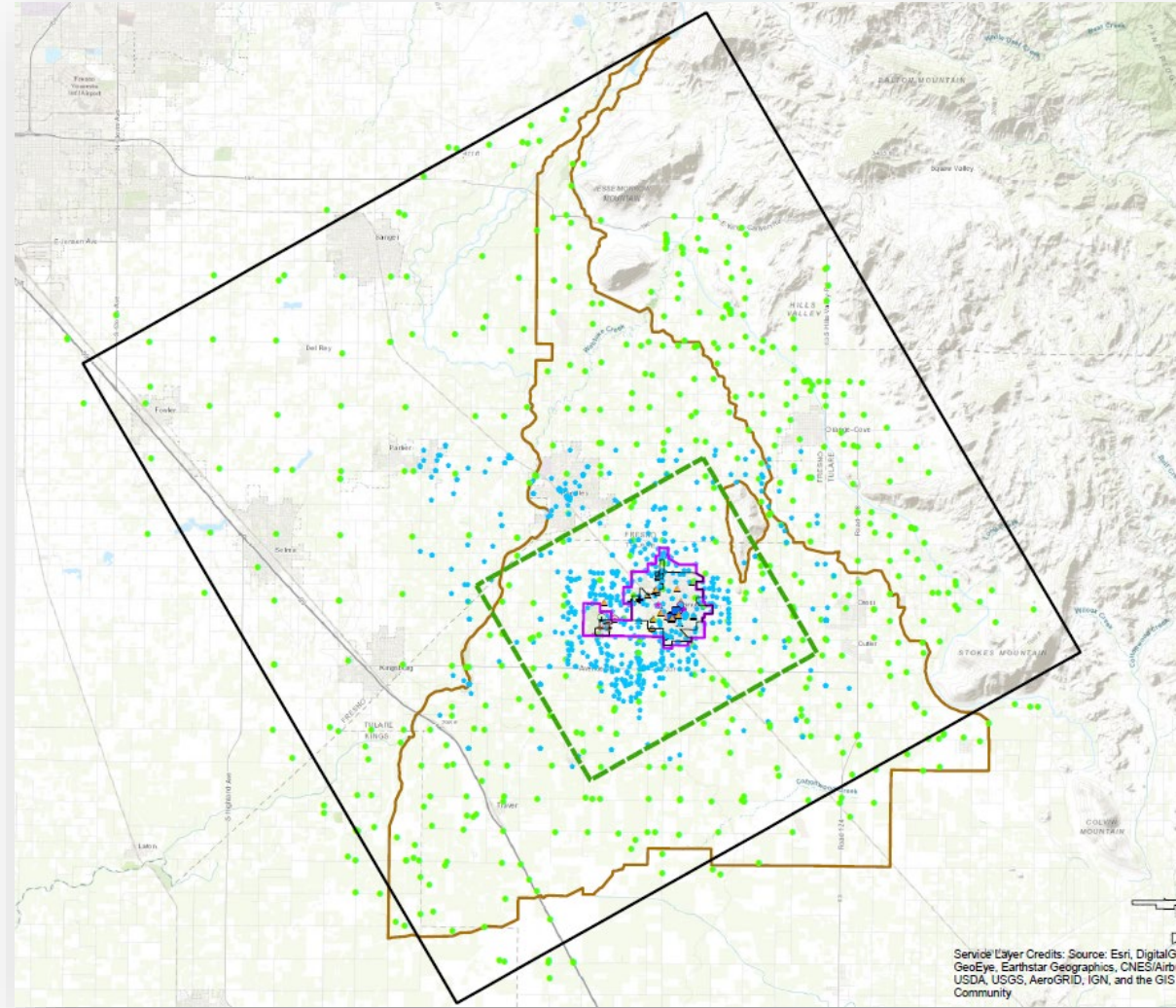


Stakeholder Advisory Group (SAG) Quarterly Meeting:

Dinuba Wellfield RI/FS Project

March 8, 2021

6 – 7 p.m. via Microsoft Teams



Funding Disclosure

Funding for this project has been provided in full or in part by Proposition 1 – the Water Quality, Supply, and Infrastructure Improvement Act of 2014 through an agreement with the State Water Resources Control Board. The contents of this presentation do not necessarily reflect the views and policies of the foregoing, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

Grant Agreement No. SWRCB D1912528



Agenda

1. Project Review
2. Field Sampling
3. Supply Well Profiling
4. Refinement of Subsurface Stratigraphy
5. Groundwater Flow Modeling
6. Major Project Deliverables
7. Schedule & Upcoming Milestones
8. Questions & General Commentary



Project Review: Goals & Benefits

Project Overview

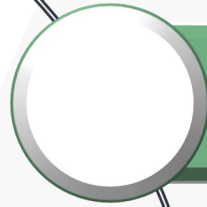
- City of Dinuba received a \$1.75 million Proposition 1 Groundwater Grant from the SWRCB for the Dinuba Wellfield RI/FS Project.
- Study to develop potential implementation options to clean up or prevent the spread of non-point source pollutants in its municipal wellfield.
- Identify effective means to address nitrate, DBCP and 1,2,3-TCP, which are widespread in the shallow aquifers in the region and identify projects which can be funded under future implementation grants to help assure a more secure and higher quality water supply for the City.

Examples of Potential Implementation Options

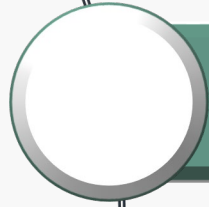
- Modify wellfield operations
- Change the wellfield configuration (modification, construction and/or destruction of wells)
- Construct recharge projects that flush the aquifer system
- Combine groundwater extraction for non-potable use, recharge to flush the aquifer system, and source reduction and construction of new wells west of the City

Benefits

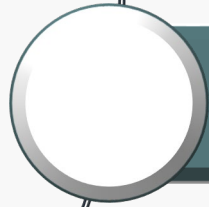
Prioritized
Projects



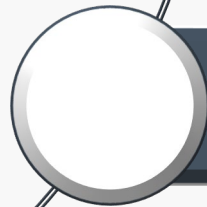
Improved groundwater quality and supply resilience



Decreased treatment costs



Recharge to increase groundwater storage

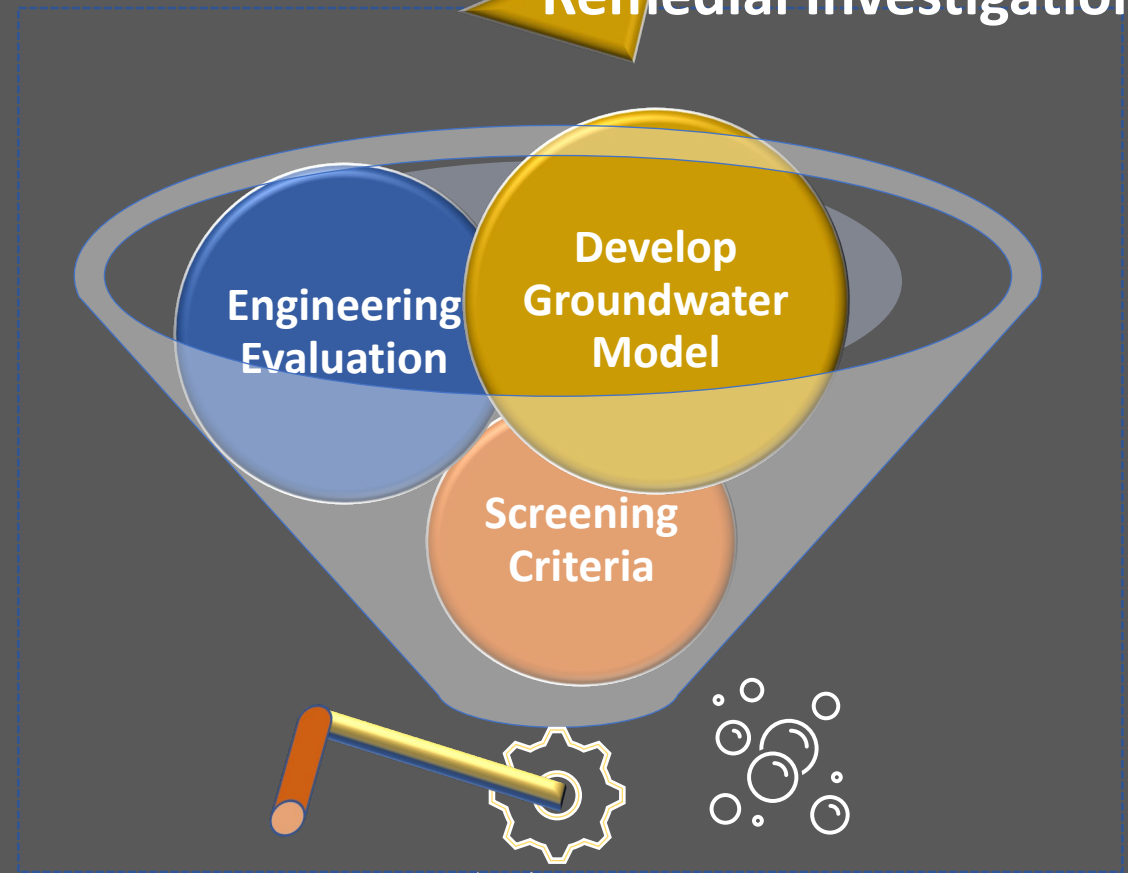


Demonstrate regional management strategies

Project Approach

Compile/Collect Data

Remedial Investigation

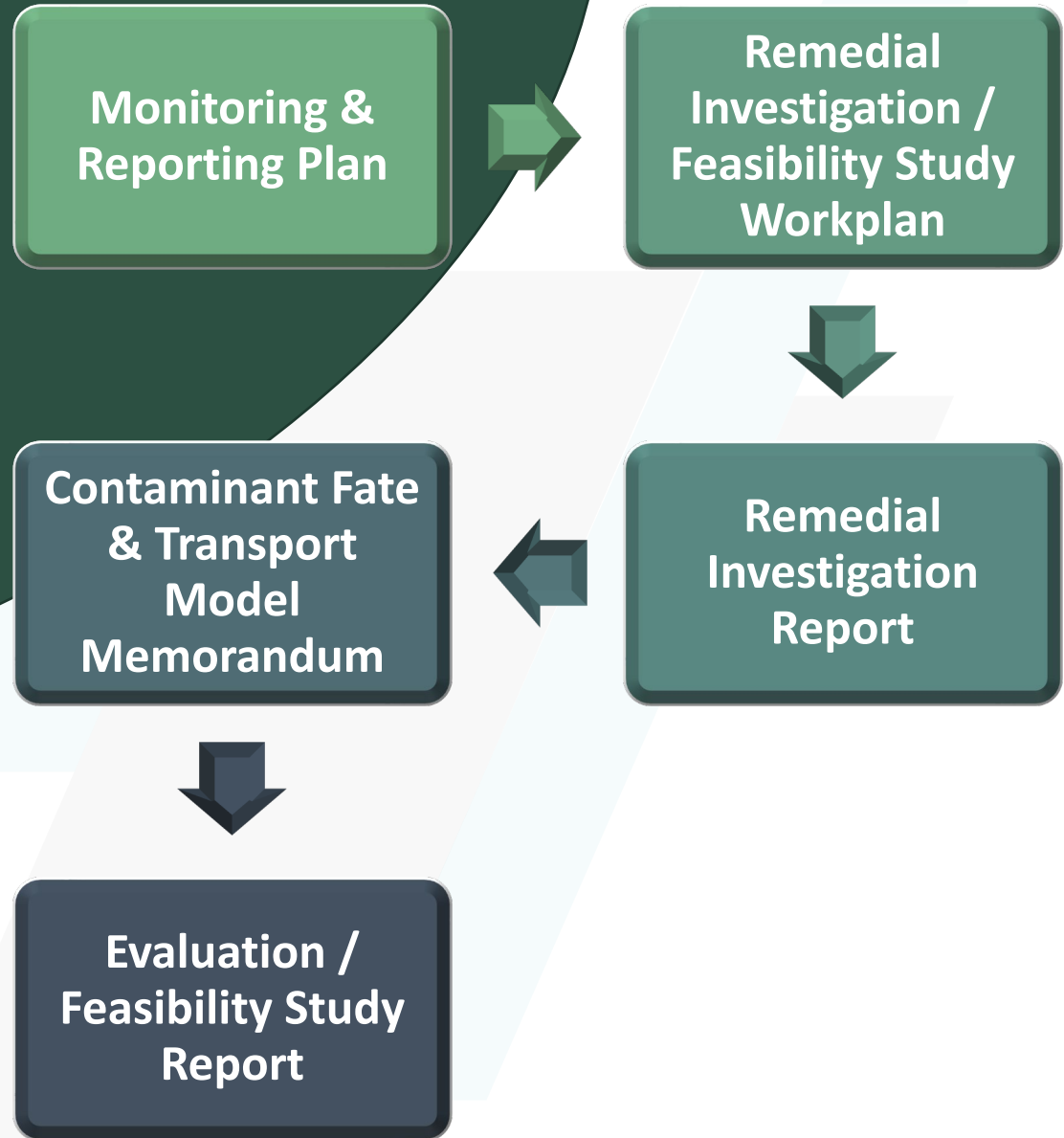


Feasibility Study



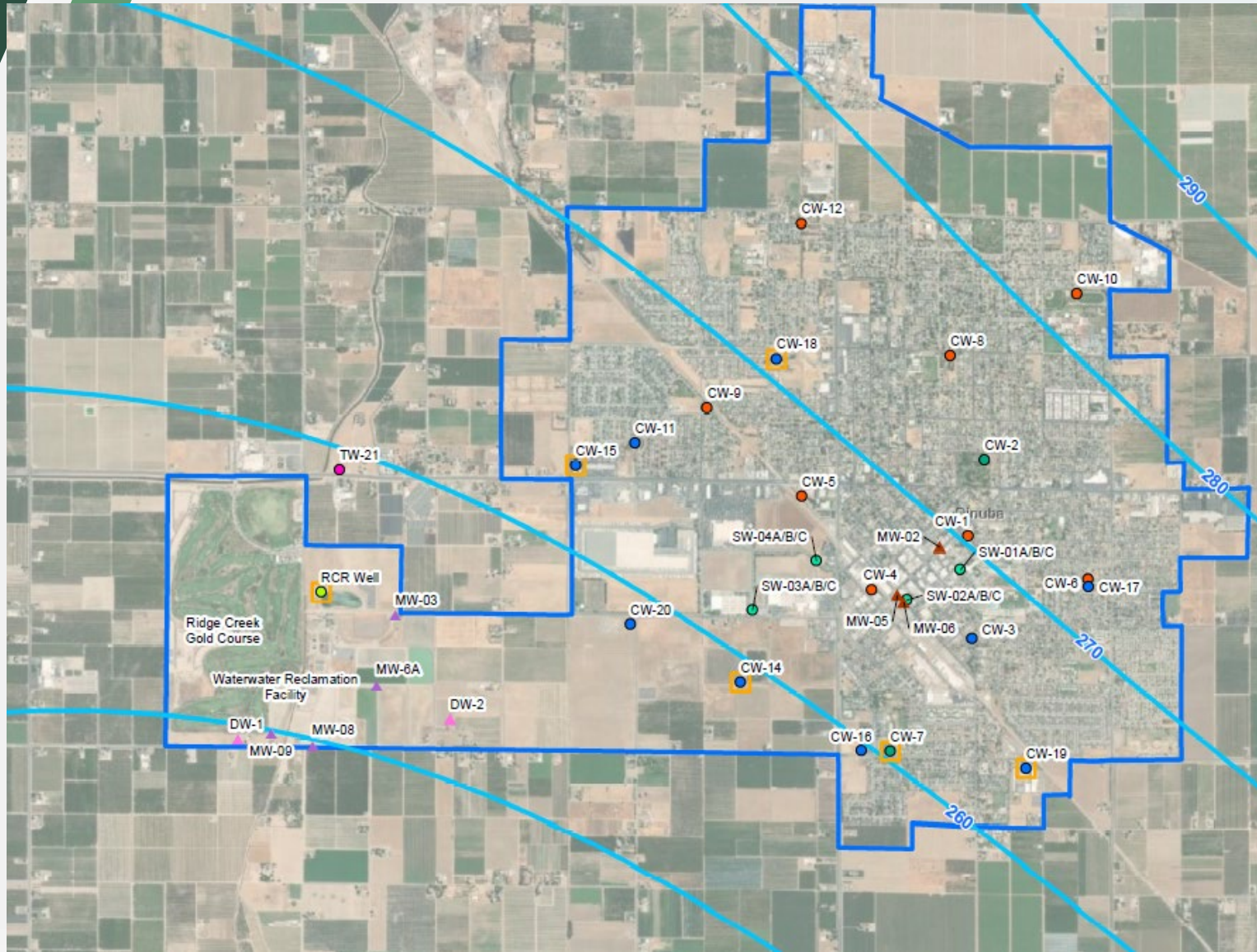
Preferred Implementation Project

Major Project Deliverables












***Field
Sampling
Status Update***



Legend

 City of Dinuba Water Service Area

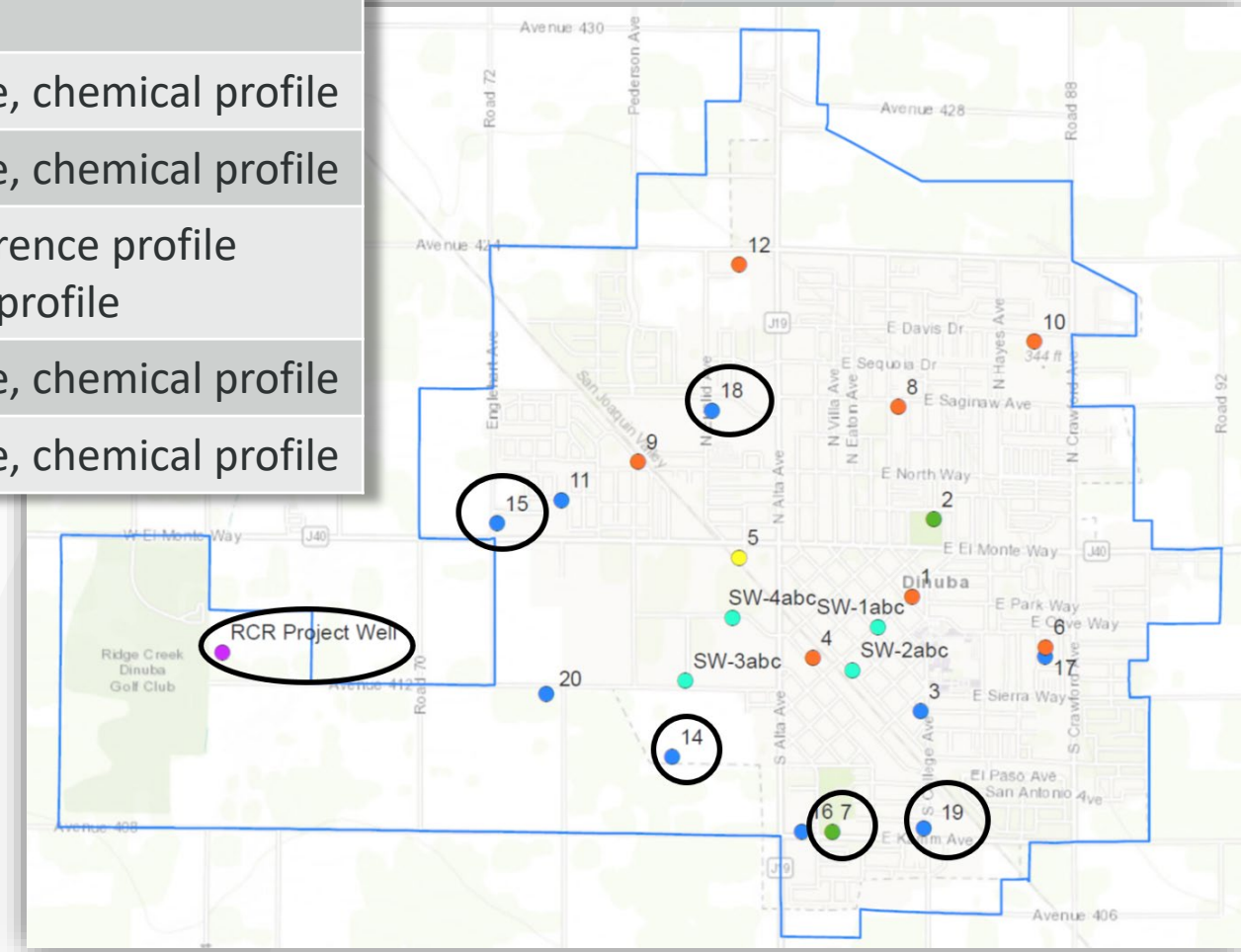
Well Type

-  Active Well
-  Destroyed Well
-  Irrigation Well
-  Monitoring Well
-  RCR Project Well
-  Standby Well

Well Type (# of wells)	Date Sampled	Screen Intervals (ft bgs)	Sample Type	Data Use Objective	Analytical
Public Water Supply Wells (6)	Oct 2020 – Nov 2020	80 - 620	Wellhead & Profiling	Assess well hydraulics, intra-borehole flow and vertical COC distribution. Groundwater model calibration.	Hydraulics, COCs, General Minerals, Field Parameters
Dinuba Dry Cleaner Site (5)	Apr 2020 & Oct 2020	79 - 100	Wellhead	Assess lateral distribution of COCs, general water quality and GW levels in shallow aquifer system. Provide understanding of seasonal variability in COC concentrations.	GW levels, COCs, General Minerals, Field Parameters
Sentinel Wells (12)	Sep 2020 (two dry)	68 - 318	Wellhead	Assess lateral and vertical distribution of COCs, general water quality and GW levels in shallow aquifer system. GW model calibration.	GW levels, COCs, General Minerals, Field Parameters
WWRF Monitoring Wells (4)	Nov 2020	80 - 160	Wellhead	Assess lateral distribution of COCs, general water quality and GW levels in shallow aquifer system near the RCR well.	GW levels, COCs, General Minerals, Field Parameters
Test Well #21	Jul 2020	Multiple depths 207 - 700	Grab Sampling	Assess vertical distribution of COCs near the RCR well.	COCs
Domestic Wells (2)	Feb 2021	TD 250 and 300 Screens Unknown	Wellhead	Assess lateral and vertical distribution of COCs downgradient of Dinuba WWRF. (Second domestic well added in place of City Well #2.)	COCs

Supply Well Profiling

Well No.	Screen Interval	Profile Type
RCR Well	100-250	Video survey, ambient and dynamic profile, chemical profile
7	87 - 190	Video survey, ambient and dynamic profile, chemical profile
14	225-620	Video survey, ambient and dynamic profile, chemical profile
15	370-595	Video survey, ambient profile, well interference profile (with Well 11 pump on and off), chemical profile
18	260-610	Video survey, ambient and dynamic profile, chemical profile
19	233-563	Video survey, ambient and dynamic profile, chemical profile



Application of Ambient Well Profile Data (Pump Off)

*Determine groundwater flow within the well
with the pump off*

*Evaluate vertical contaminant migration
within the well*

Validate the groundwater model

Assess well how wells interact in the wellfield

Application of Dynamic Well Profiles (Pump On)

Determine depth-specific contaminant concentrations and inflow into the well

Estimate wellhead concentrations for wells with long screen intervals

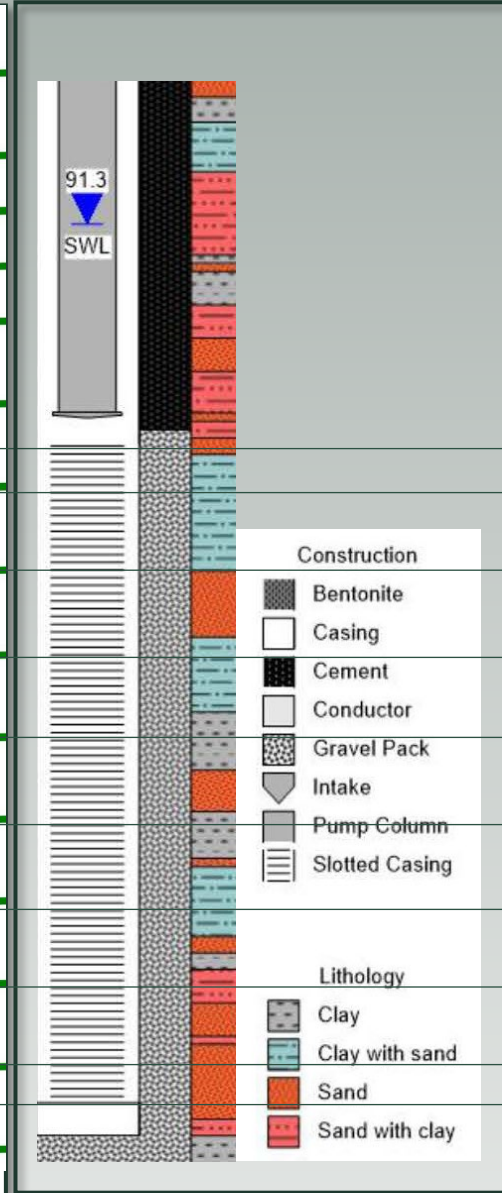
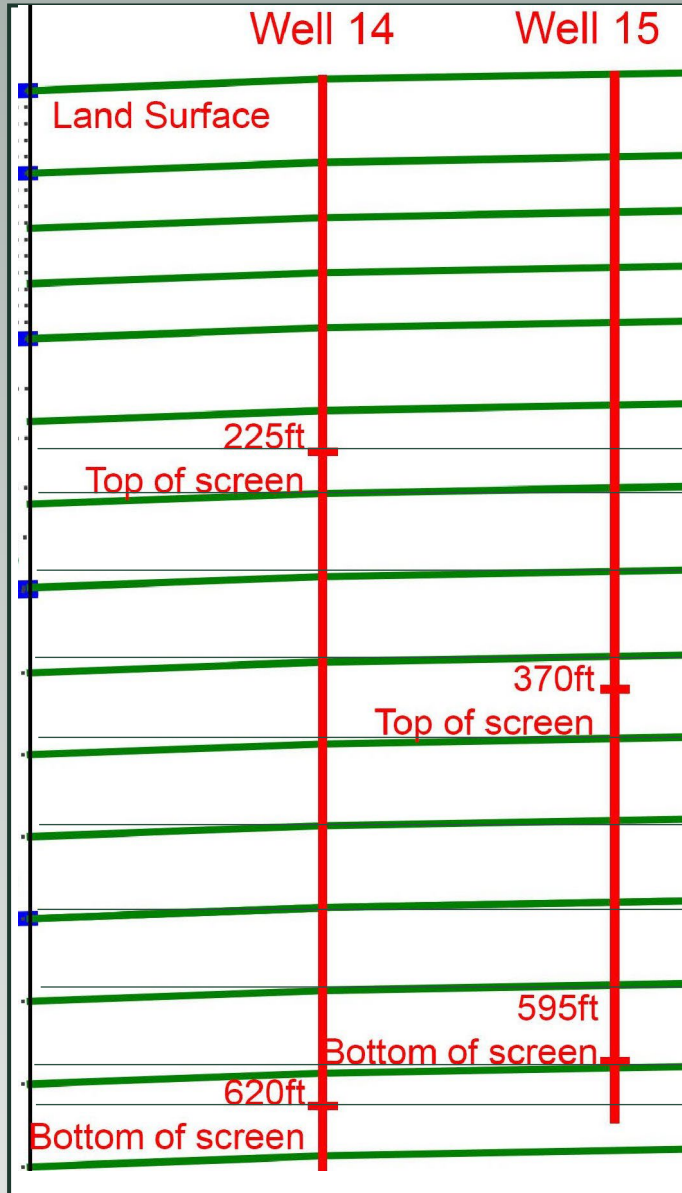
Evaluate vertical distribution of flow along well screens

Validate the groundwater model

Well 14 Hydraulic and TCP Chemical Profiles

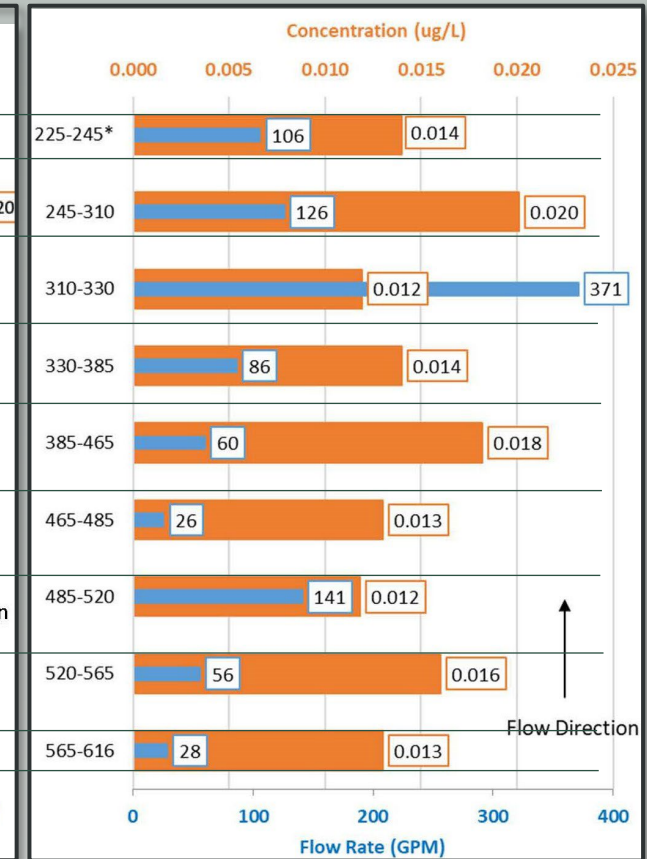
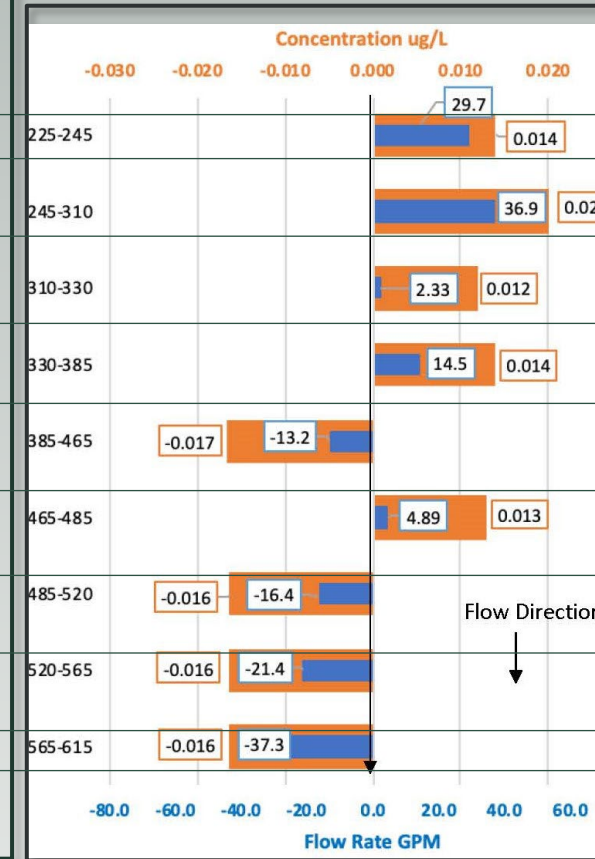
DRM Model Layering

Well Log



Ambient Profiles

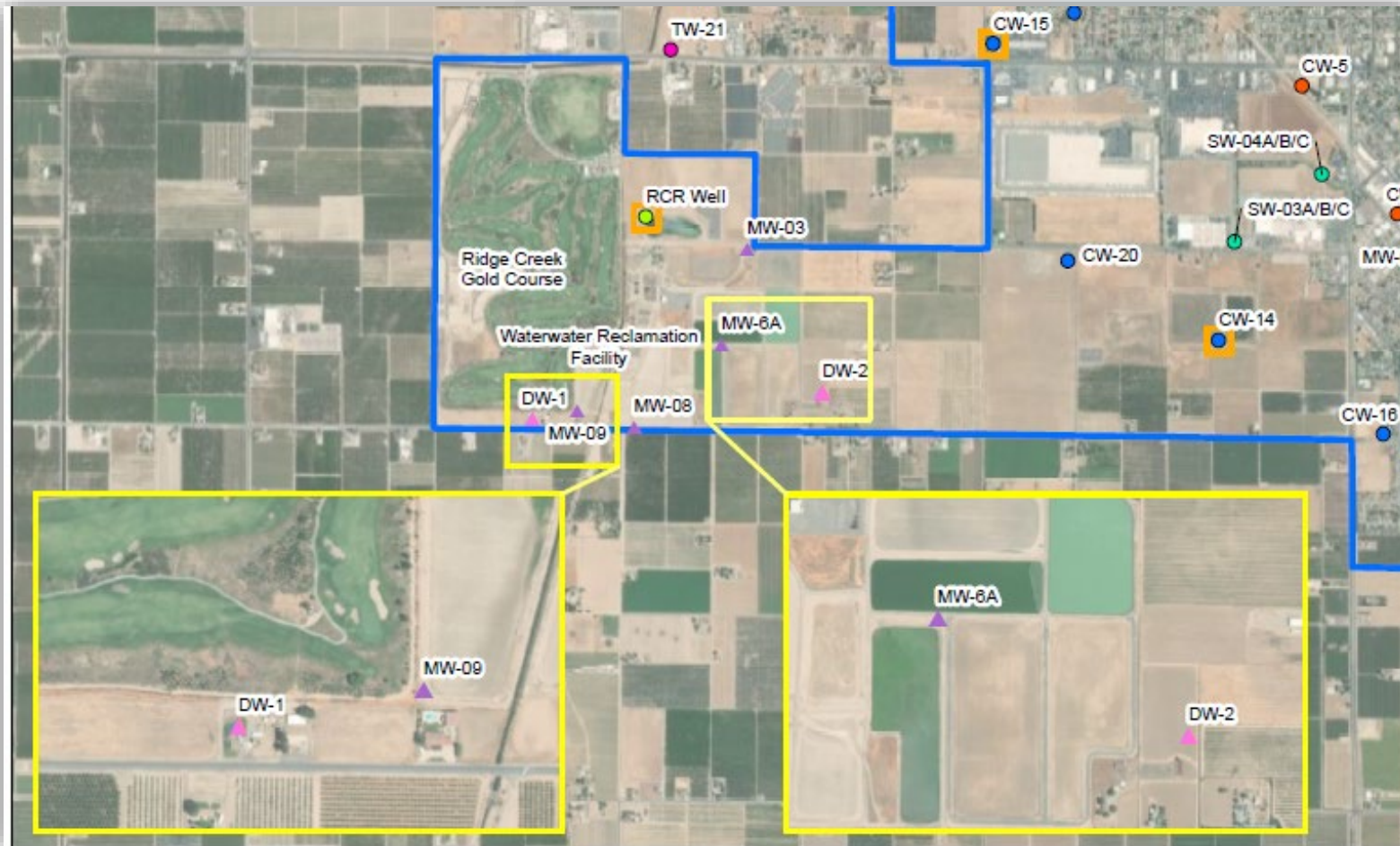
Dynamic Profiles

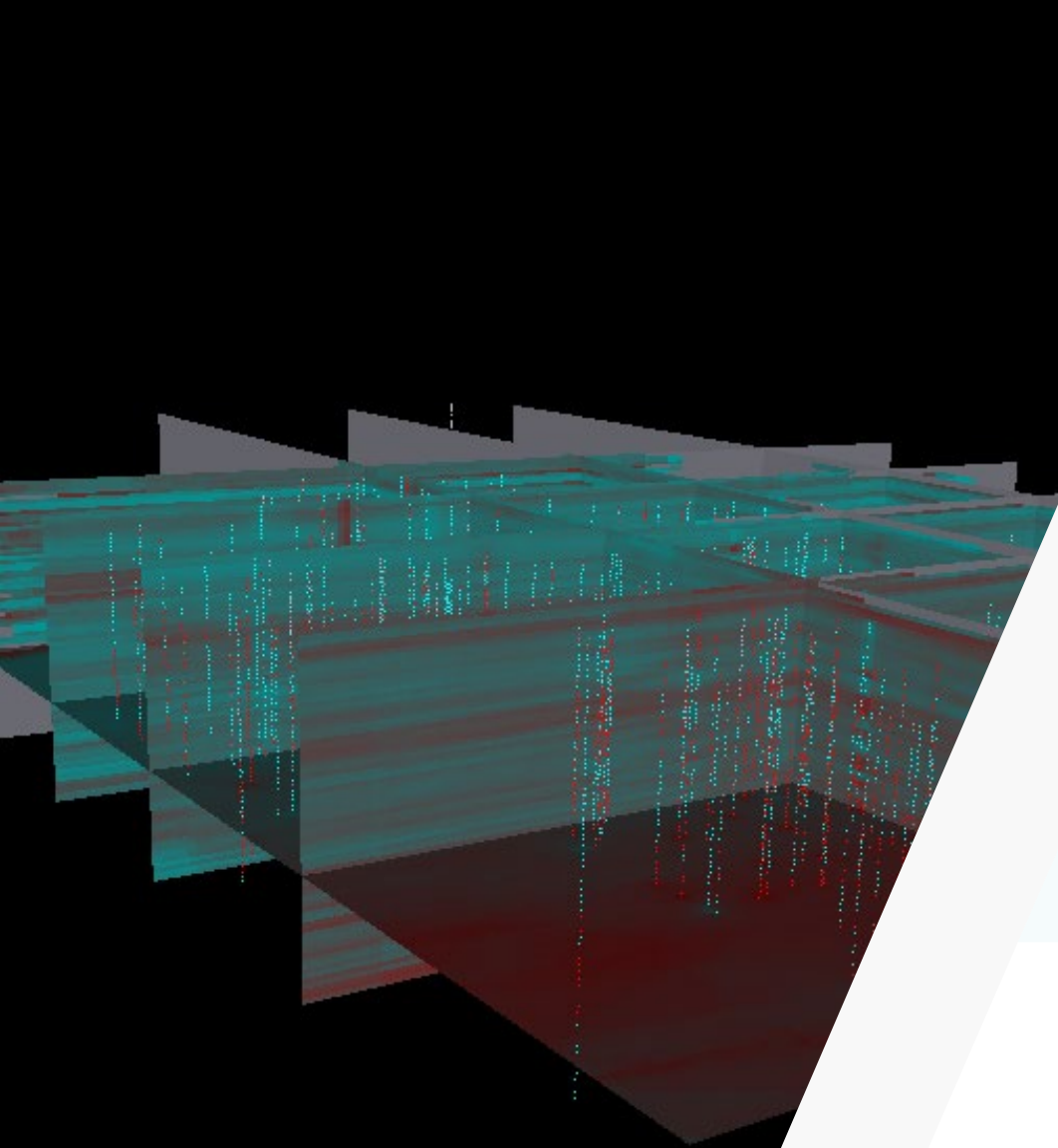


Domestic Well Sampling

Groundwater Sampling Virtual Site Tour video available at:

<http://www.dinuba.org/dinuba-wellfield-remedial-investigation-and-feasibility-study-project>

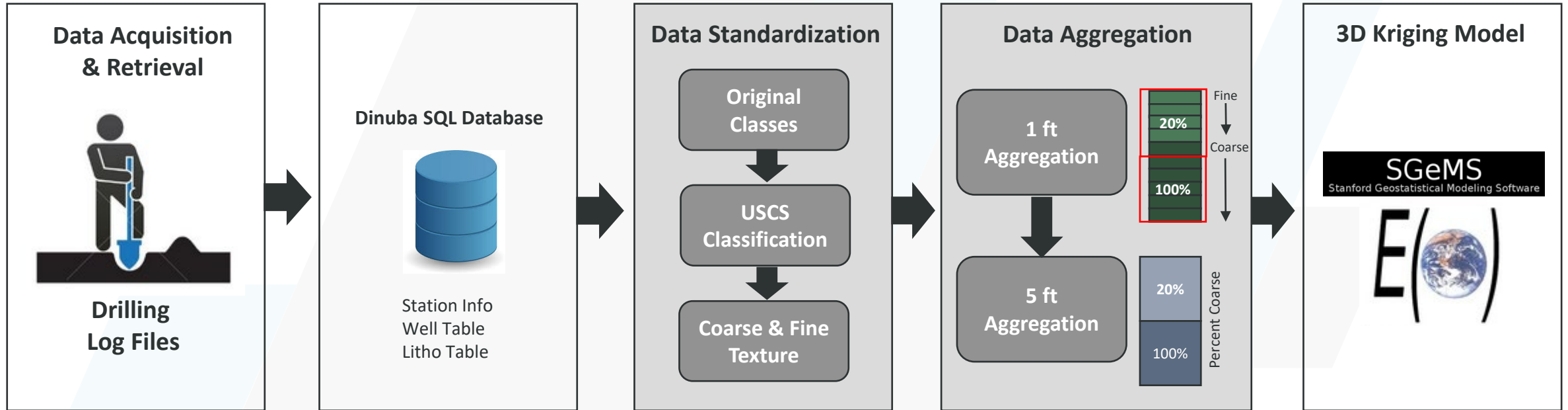




Refinement of Subsurface Stratigraphy

Lithologic Data Analysis

General workflow



ORIGINAL
File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
WATER WELL DRILLERS REPORT

Do not fill in
No. 25048
State Well No. 16/23-25
Other Well No.

(12) WELL LOG: Total depth 182 ft. Depth of completed well 182 ft.
from ft. to ft. Remarks (Describe by color, character, size or material)

0	6	Sand
6	12	Hard pan
12	36	Sand
36	40	Soft clay
40	96	Sand
96	103	Soft clay
103	108	Shale
108	110	Soft clay
113	135	Sand
135	138	Soft clay
138	157	Sand
157	163	Red clay
163	180	Sand
180	182	Soft clay

(2) LOCATION OF WELL (See instructions):
County Tulare
Well address if different from above
Township 16S Range 23E Section 25
Distance from cities, roads, railroads, fences, etc. 370' N. of Ave. 396;
1/4 mi. E. of Rd. 68

(3) TYPE OF WORK:
New Well Deepening
Reconstruction
Reconditioning
Horizontal Well
Destruction (Describe destructive materials and procedures in item 12)

(4) PROPOSED USE:
Domestic
Agriculture
Industrial
Test Well
Municipal
Other

WELL LOCATION SKETCH

Adapting methodology used by USGS:

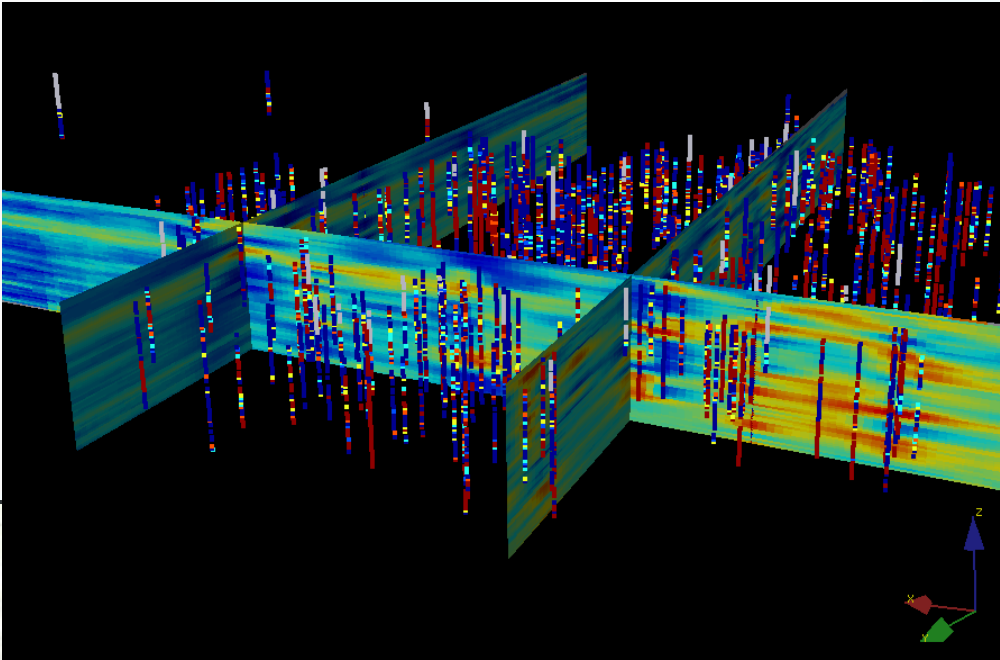
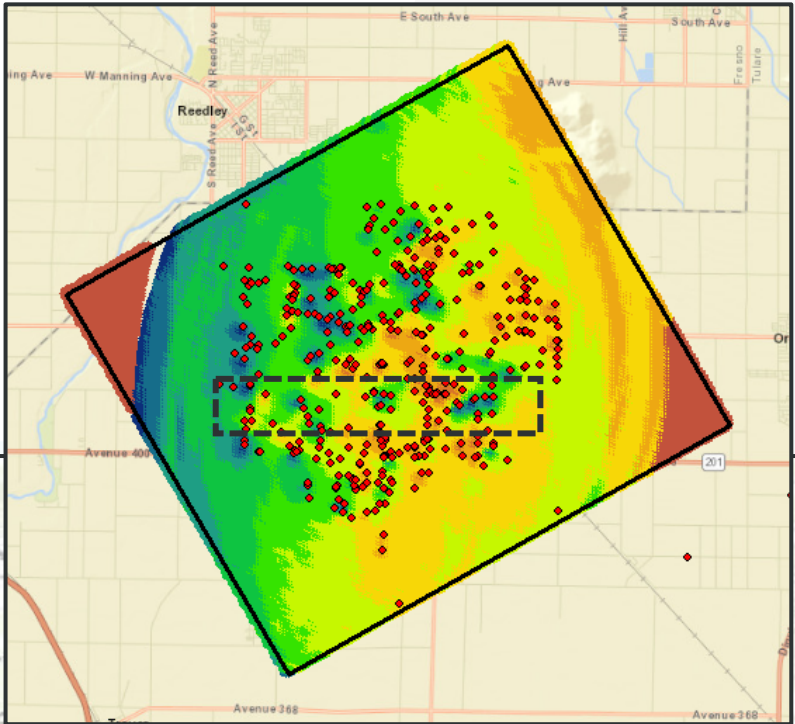
Development of a three-dimensional model of sedimentary texture in valley-fill deposits of Central Valley, California, USA

C. C. Faunt (✉) · K. Belitz · R. T. Hanson
US Geological Survey,
California Water Science Center, San Diego Projects Office,
4165 Spruance Road, Suite 200, San Diego, CA 92024, USA

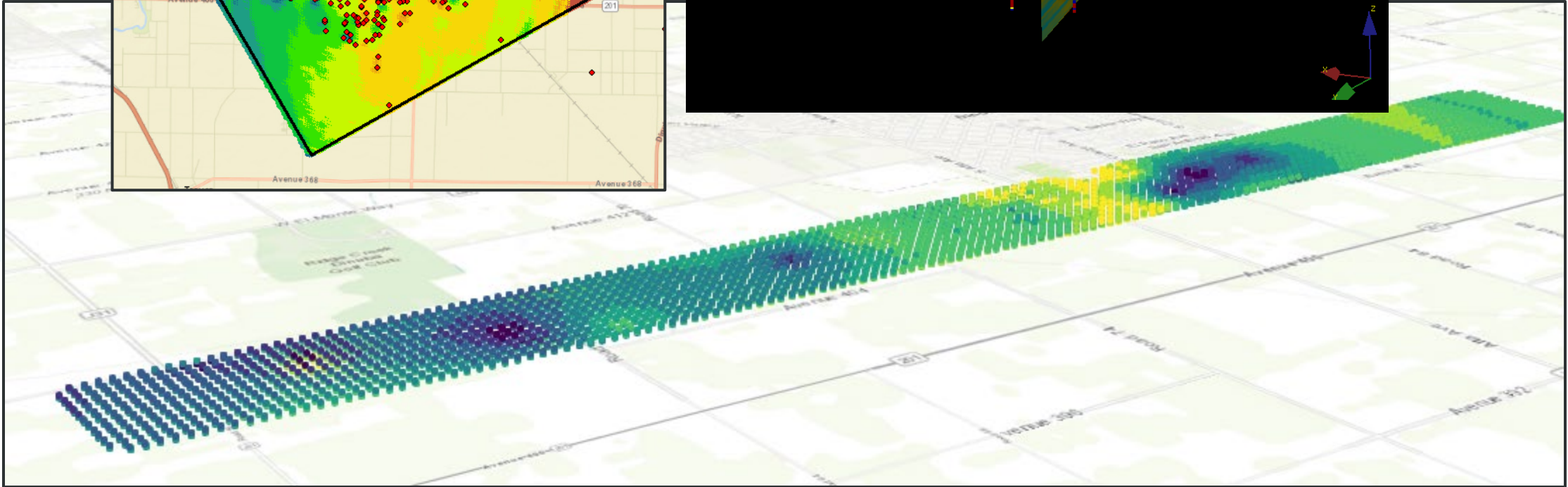
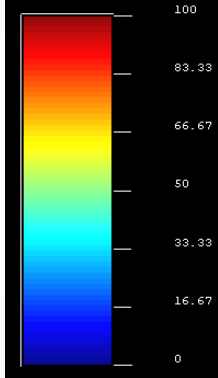
Snapshot of Refined Subsurface Model

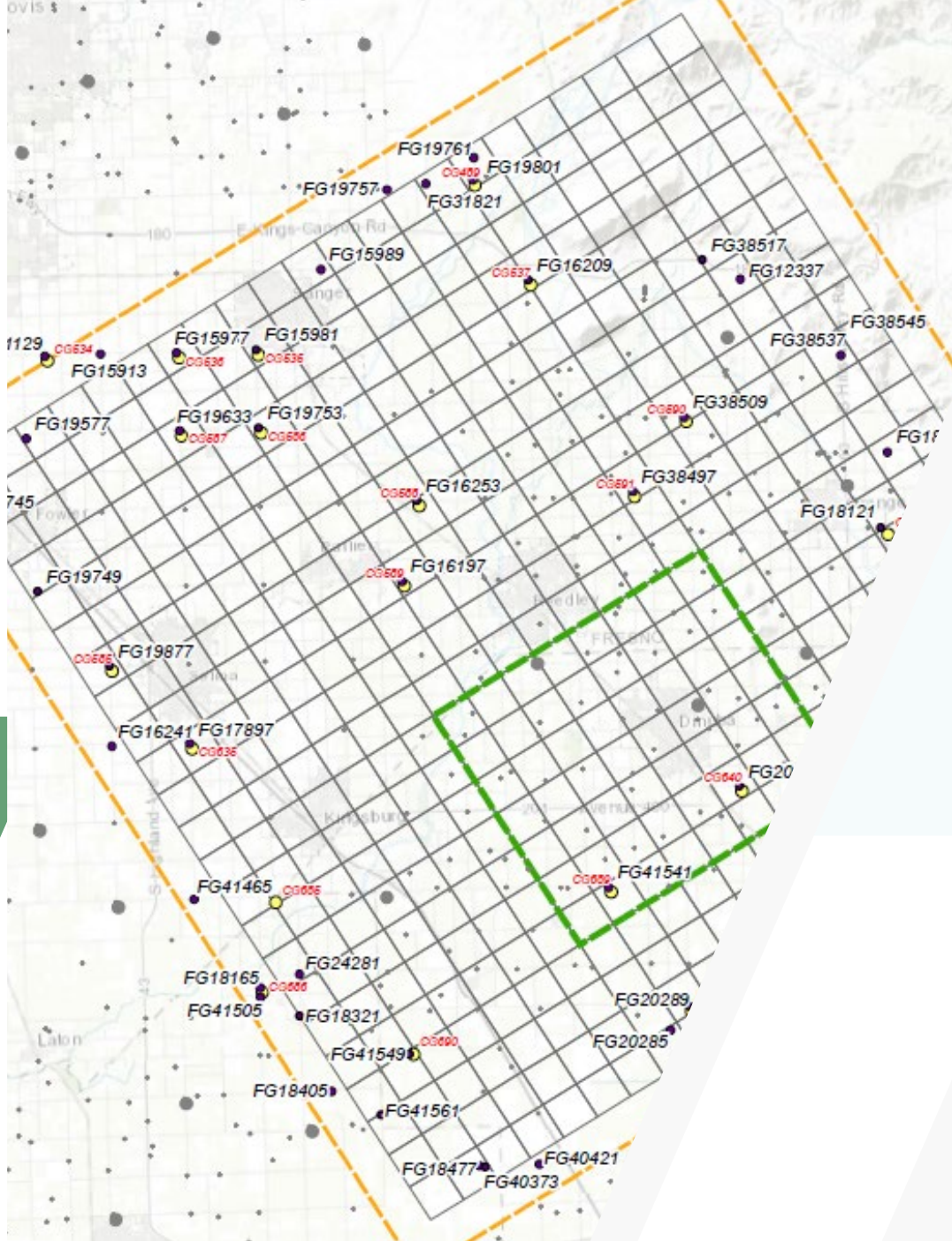
% Coarse

- 1 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 60
- 61 - 68
- 69 - 80
- 81 - 90

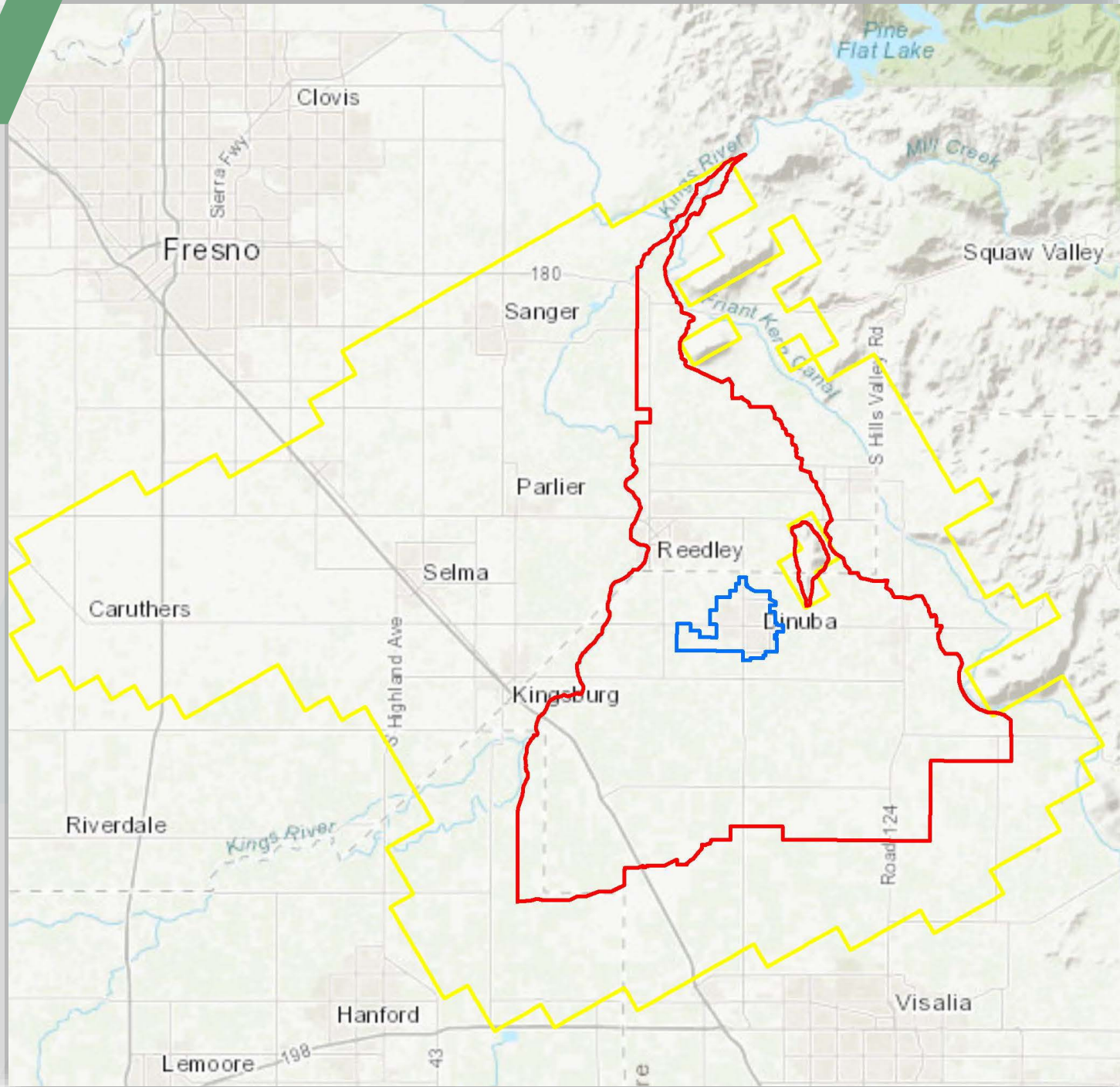


% Coarse








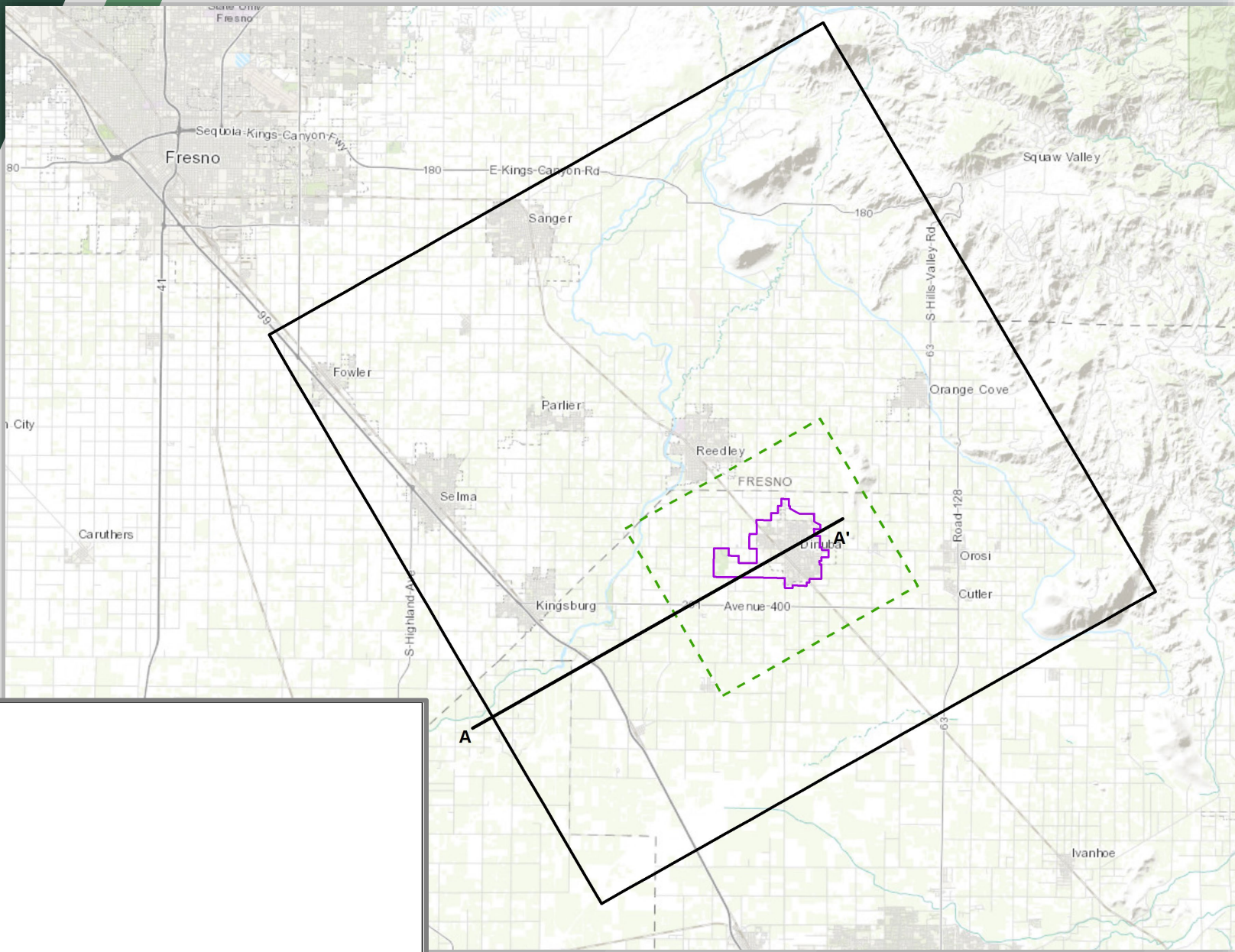
Groundwater Flow Model Development



Legend

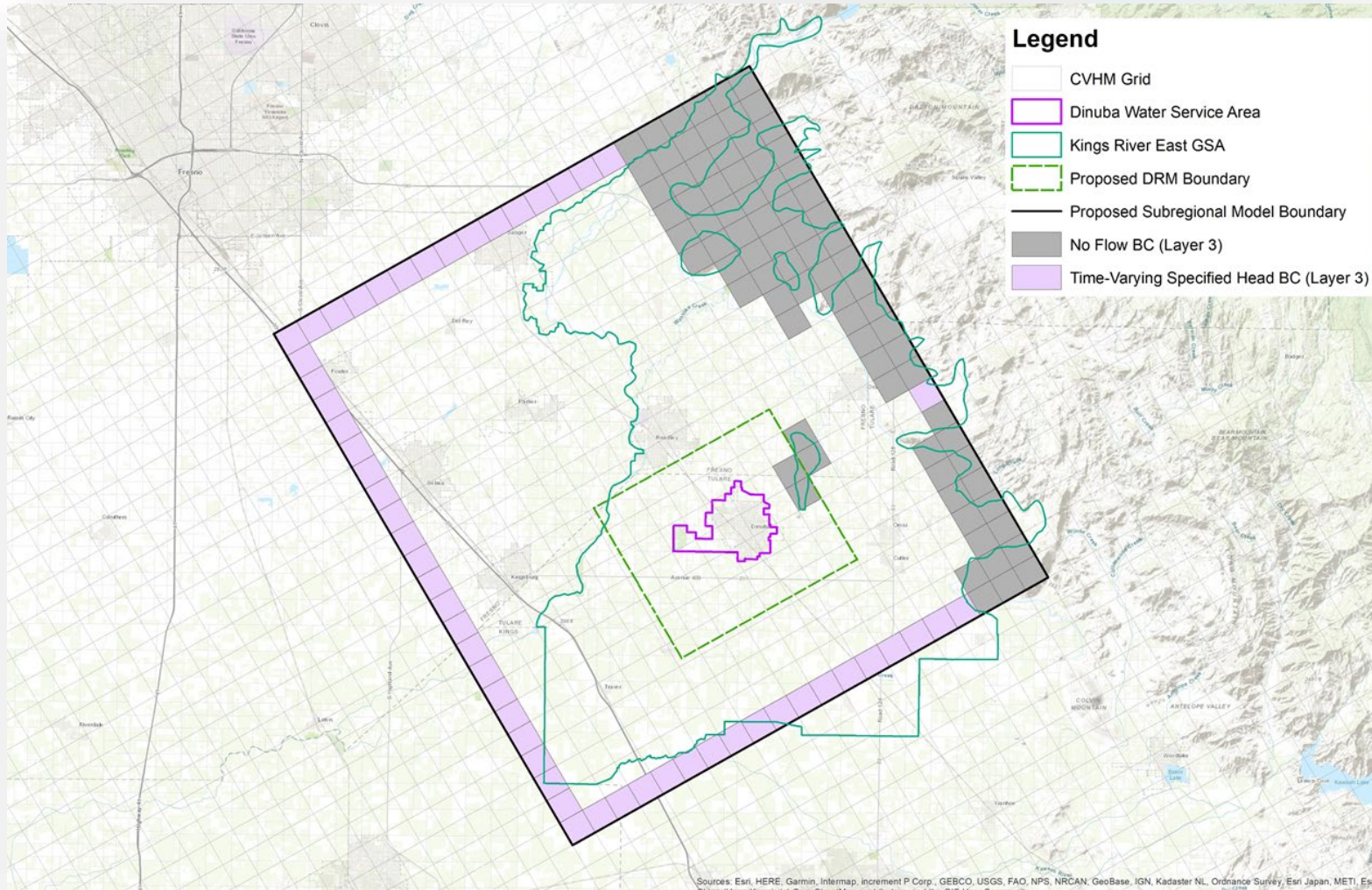
-  Alta Irrigation District
-  AID Model Boundary
-  City of Dinuba Water Service Area

Dinuba Subregional Model (DSRM) and Dinuba Refined Model (DRM) Domain

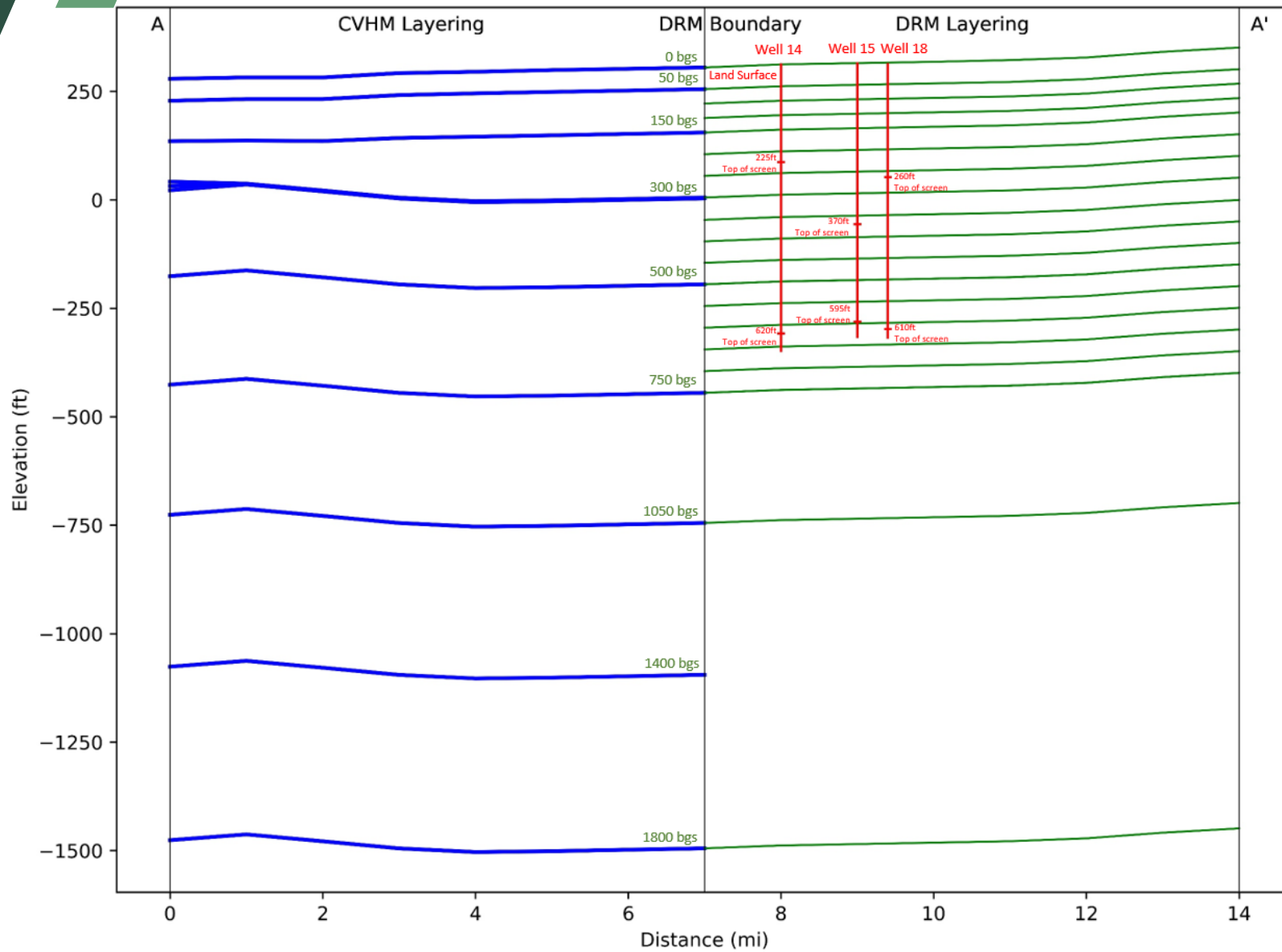


Dinuba Subregional Model Development

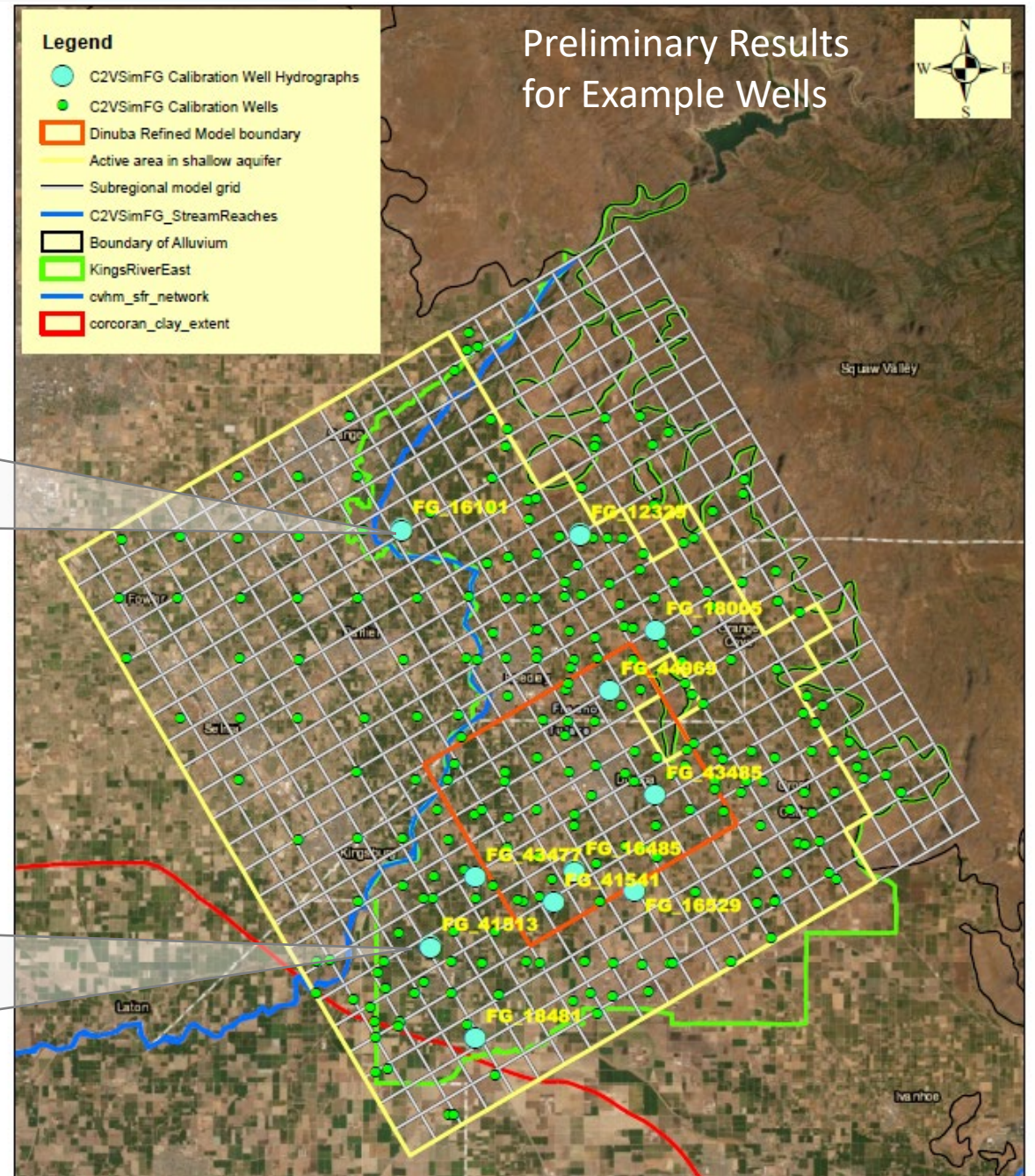
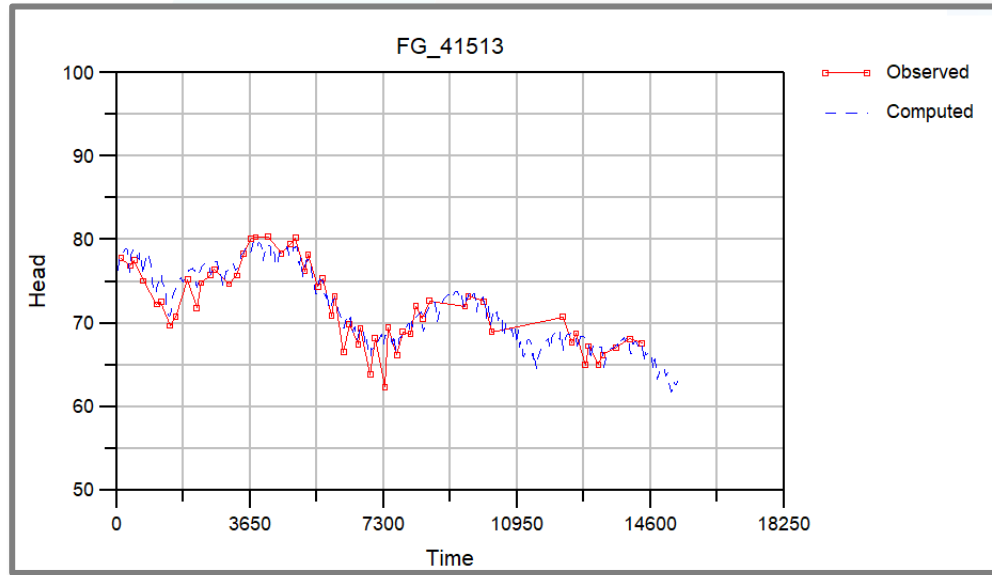
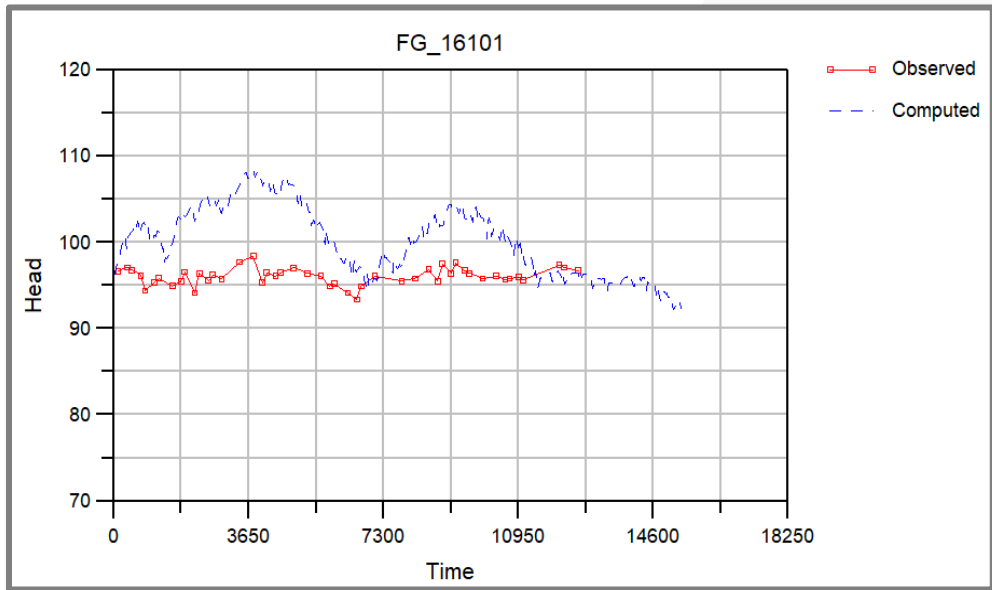
- ✓ **Model Selection.** New subregional model extracted from USGS CVHM, which was also the basis of the AID model (Hydrology through 2003)
- ✓ **Boundary Conditions.** Subregional model domain covers most of KREGSA; hydrogeologic boundaries informed from CVHM
- ✓ **Performance Validation.** Subregional model performance compared to CVHM simulated groundwater levels, groundwater flow patterns, and water budget. Produced virtually identical results
- ✓ **Regional Updating and Refinement.** Update hydrology and boundary conditions through 2015 using data from DWR C2VSIM-FG, test, adjust as needed
- ✓ **Local Updating and Refinement.** Update DRM hydrology and layer properties and run within DSRM, refine as needed around DRM boundary



Dinuba Subregional Model (DSRM) and Dinuba Refined Model (DRM)



DSRM and DRM Model Layering



DSRM Performance



Next Steps
Opportunities for Involvement
Questions & Comments

Next Steps & Upcoming Project Milestones

- Draft RI Report – March/April 2021
- Groundwater Modeling Technical Memorandum – 2nd Quarter 2021
- Draft FS Report – 2nd Quarter 2021
- Grant Agreement Schedule Requested Extension from July 2021 to October 2021
- Proposition 1 Grant Program Solicitation for Concept Proposals Late Summer 2021

	Data Sourcing & Analytics	Geodatabase & Data Management	Data Visualization & Analysis	Conceptual Site Model	Groundwater Transport Model	Remedial Investigation	Feasibility Study
3rd Quarter 2020							
4th Quarter 2020							
1st Quarter 2021							
2nd Quarter 2021							
3rd Quarter 2021							
		Complete		In Progress	Not Started		

Next Steps

- ✓ Questions?
- ✓ Review/comment on draft reports
- ✓ Next meeting June 2021
- ✓ Thank you for participating

Project Website:

<http://www.dinuba.org/departments/122-public-works/598-dinuba-rifs>

For more information please contact:

Ismael Hernandez at ihernandez@dinuba.ca.gov

Trilby Barton at tbarton@ppeng.com

Mike Tietze at mtietze@formationenv.com

Sarah Raker at sraker@formationenv.com