Integrated One Water Framework for Water Master Plan – Unincorporated Solano County

Eastside Agricultural Areas Challenges and Potential Actions

June 10, 2024

Kennedy Jenks

Meeting Agenda

1

INTRODUCTIONS

Purpose of the Solano One Water Framework

2

MEETING PURPOSE AND OUTCOMES

Solano One Water Recap

Meeting Purpose and Outcomes

3

EXISTING CHALLENGES AND ACTIONS

Overview of Eastside Area:

- Challenges/Needs
- Completed, Ongoing, and Potential Future Actions

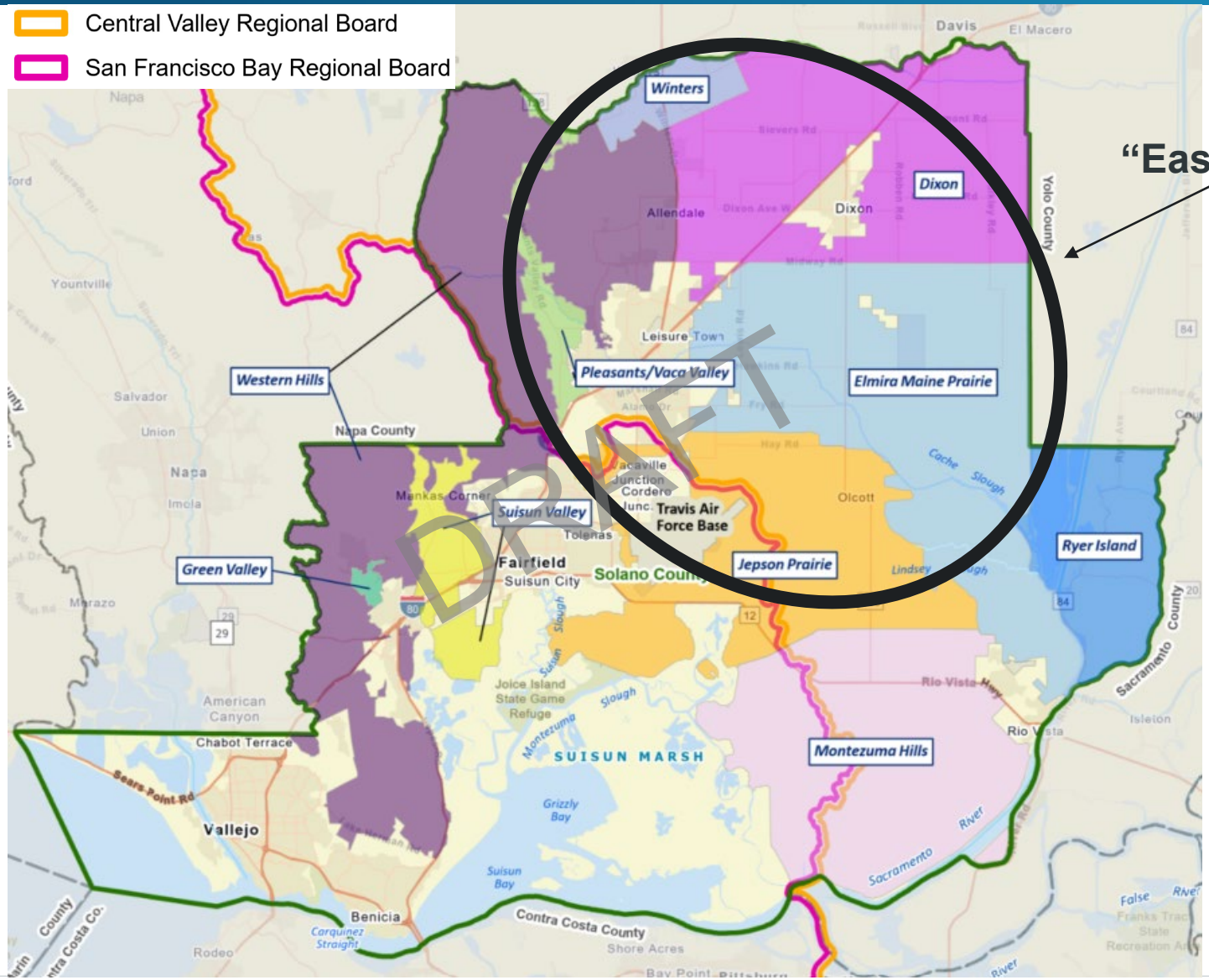
4

POTENTIAL FUTURE MASTER PLAN ACTIONS

Potential Case Study Ideas

Next Steps

“Eastside Area” Definition



Purpose of the Solano One Water Framework

- One Water Framework Objective
  - Focus on water resources in unincorporated County
  - Support and align with implementation of Solano County General Plan
  - Identify water-related challenges and opportunities through a stakeholder process
  - Develop One Water concepts and guiding principles collaboratively with goals, objectives, and strategies to support Ag-related economic development in unincorporated Solano County
  - Establish a process to develop regional, multi-benefit projects that leverage regional cooperation and coordination
- One Water Framework Outcome:
  - Vision, goals, and strategies as a roadmap to future Solano County Utilities Master Plan
- Website: https://www.solanocounty.com/depts/rm/delta_and_water_programs/one_water_framework/

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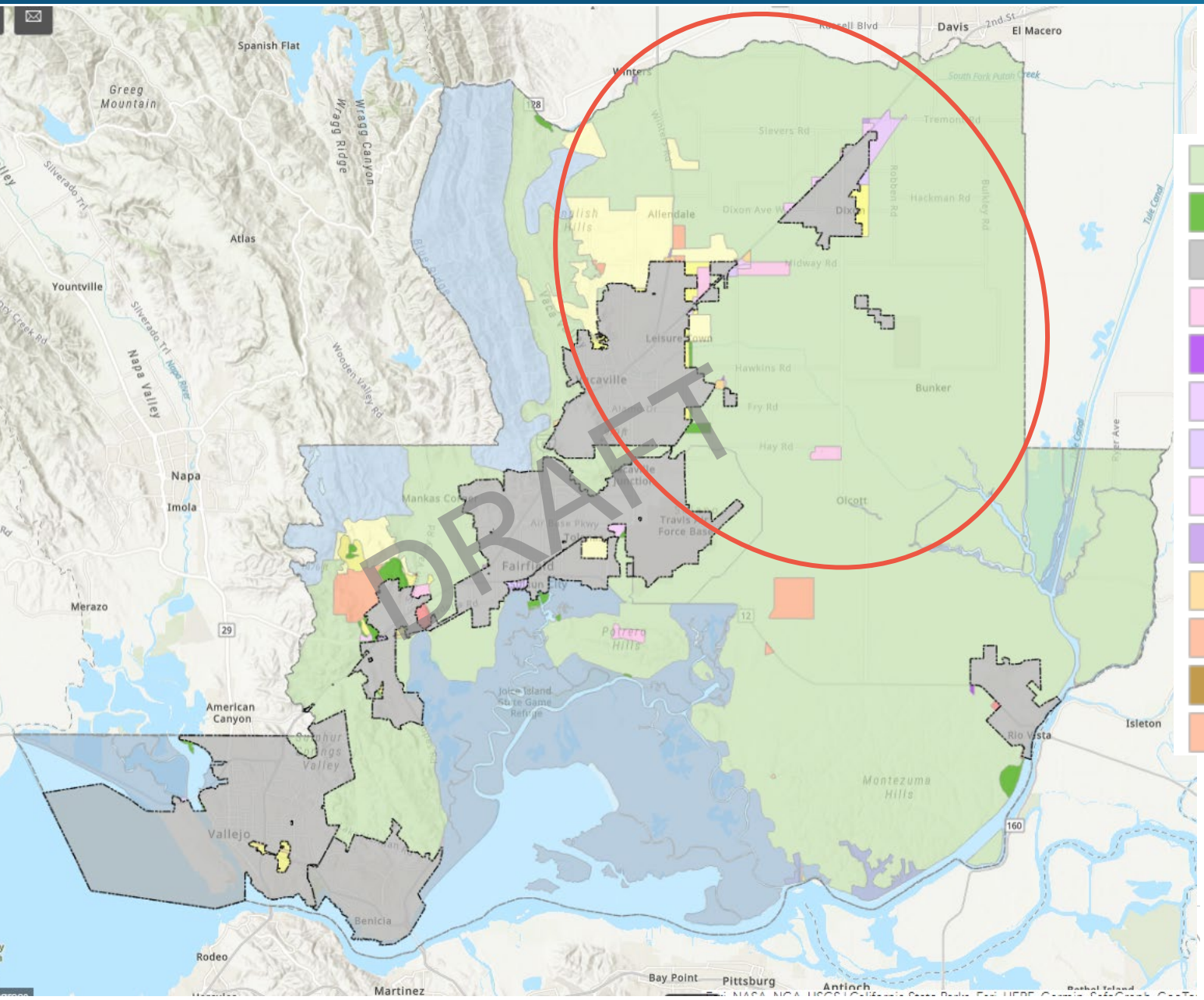
Solano One Water – Supporting General Plan Implementation



GENERAL PLAN LAND USE DESIGNATIONS – UNINCORPORATED COUNTY

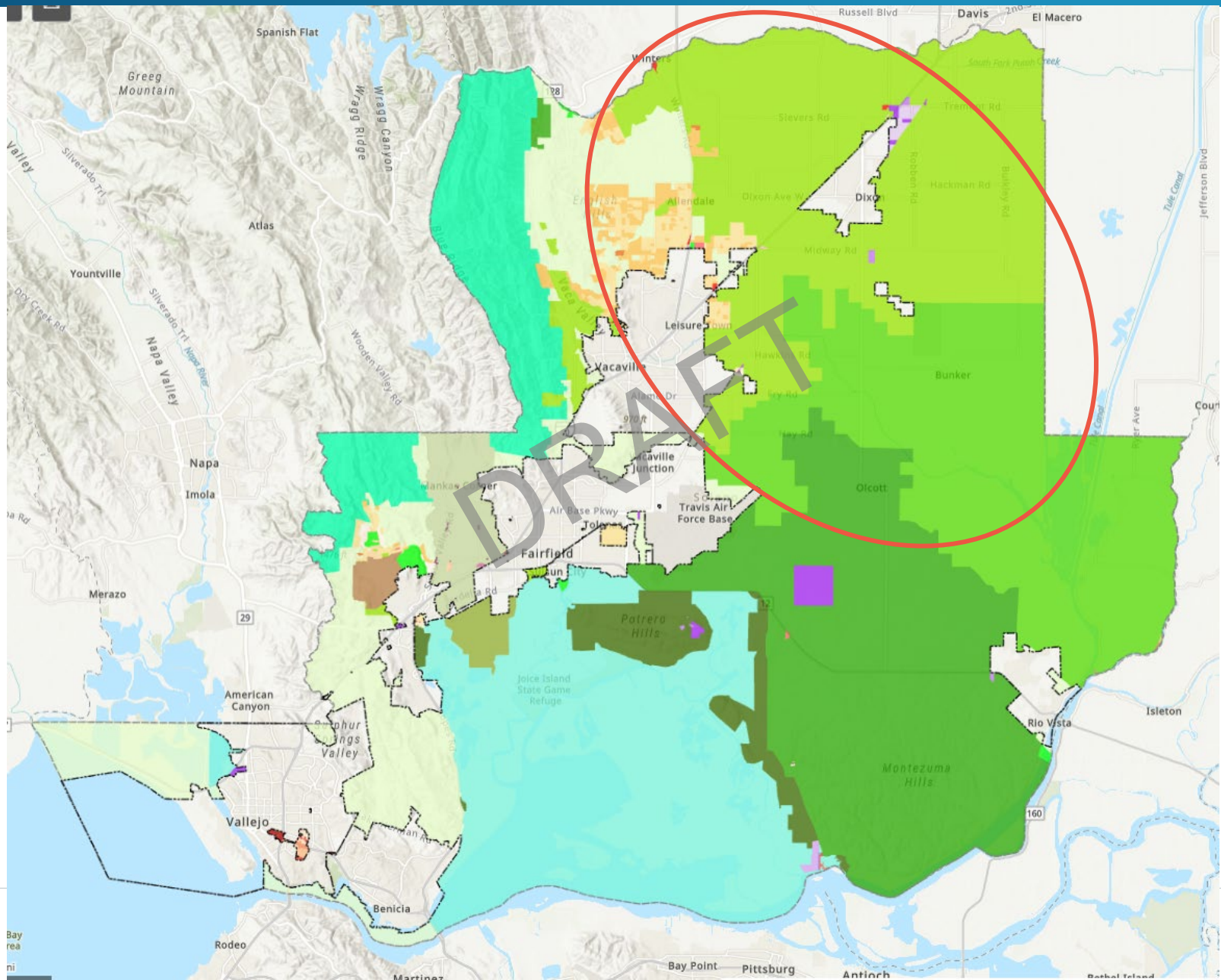
- Agriculture
- Park and Recreation
- Incorporated Area
- Public/Quasi-Public
- General Industrial
- Limited Industrial
- Urban Industrial
- Urban Commercial
- Service Commercial
- Highway Commercial
- Commercial Recreation
- Neighborhood Commercial
- Specific Project Area
- Urban Project Area
- Urban Residential
- Rural Residential
- Traditional Community - Residential
- Traditional Community - Mixed Use
- Marsh
- Water Bodies and Courses
- Water Dependent Industrial
- Watershed

Source: Solano County Resource Management Viewer.
"Solano_County_Unincorporated_General_Plan_2008_Updated"

Unincorporated County Zoning in the Eastside Area

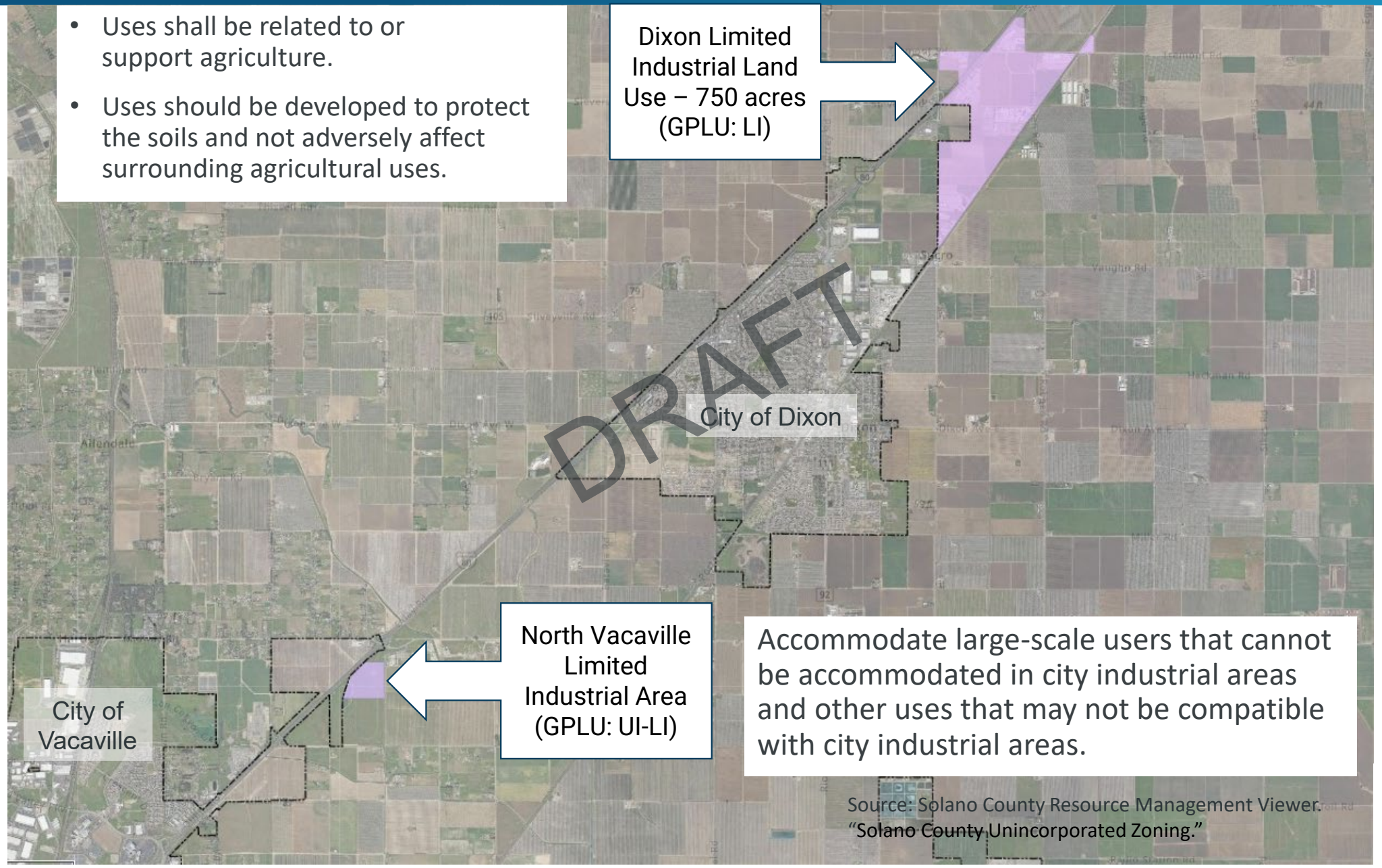
UNINCORPORATED COUNTY ZONING

A-20	RTC-20	CS
A-40	RTC-15	I-AS
A-80	RTC-10	IWD
A-160	RTC-6	MG-1/2
ASM-80	RTC-4	MG-3
ASM-160	RTC-D6	MP
ASV-20	RTC-D4	W-160
ATC	RTC-MF	P
ATC-NC	RTC-MU	MGV-SP
RR-2.5	CH	
RR-5	CN	
RR-10	CR	
RTC-1AC	CRL	



Source: Solano County Resource Management Viewer. "Solano County Unincorporated Zoning."

Limited Industrial Land Use Areas for Ag Support



Source: Solano County Resource Management Viewer. "Solano County Unincorporated Zoning."

PURPOSE AND OUTCOMES OF TODAY'S MEETING

Present an overview of existing systems, challenges, and complete/in-progress activities for

- Water
- Wastewater
- Drainage/Flood

in the Eastside agricultural areas

Discuss and refine potential Master Plan actions in addressing challenges for

- Water
- Wastewater
- Drainage/Flood

and Discuss Case Study Ideas

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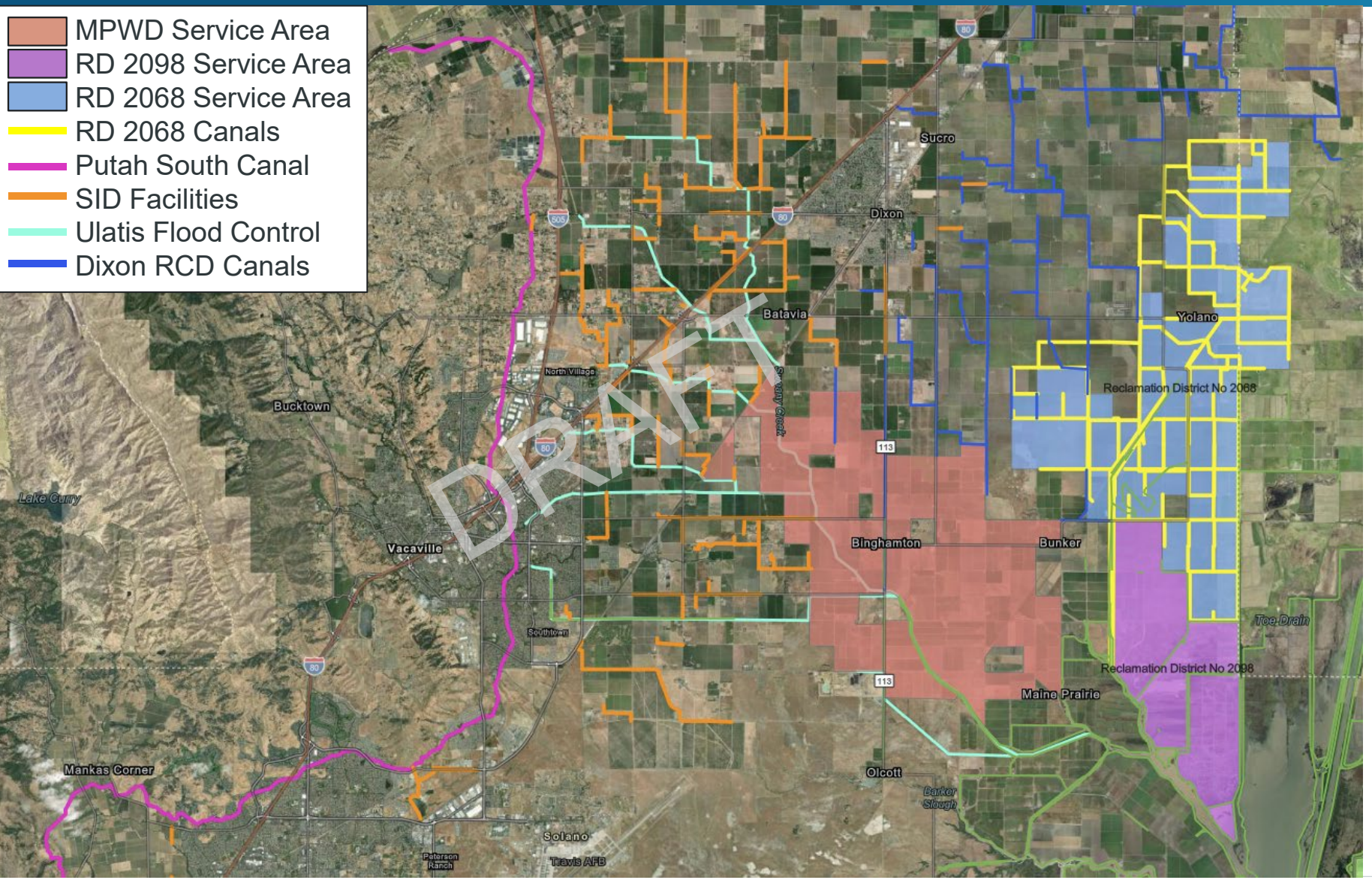
Overview of Eastside Area

Water Supply & Conveyance

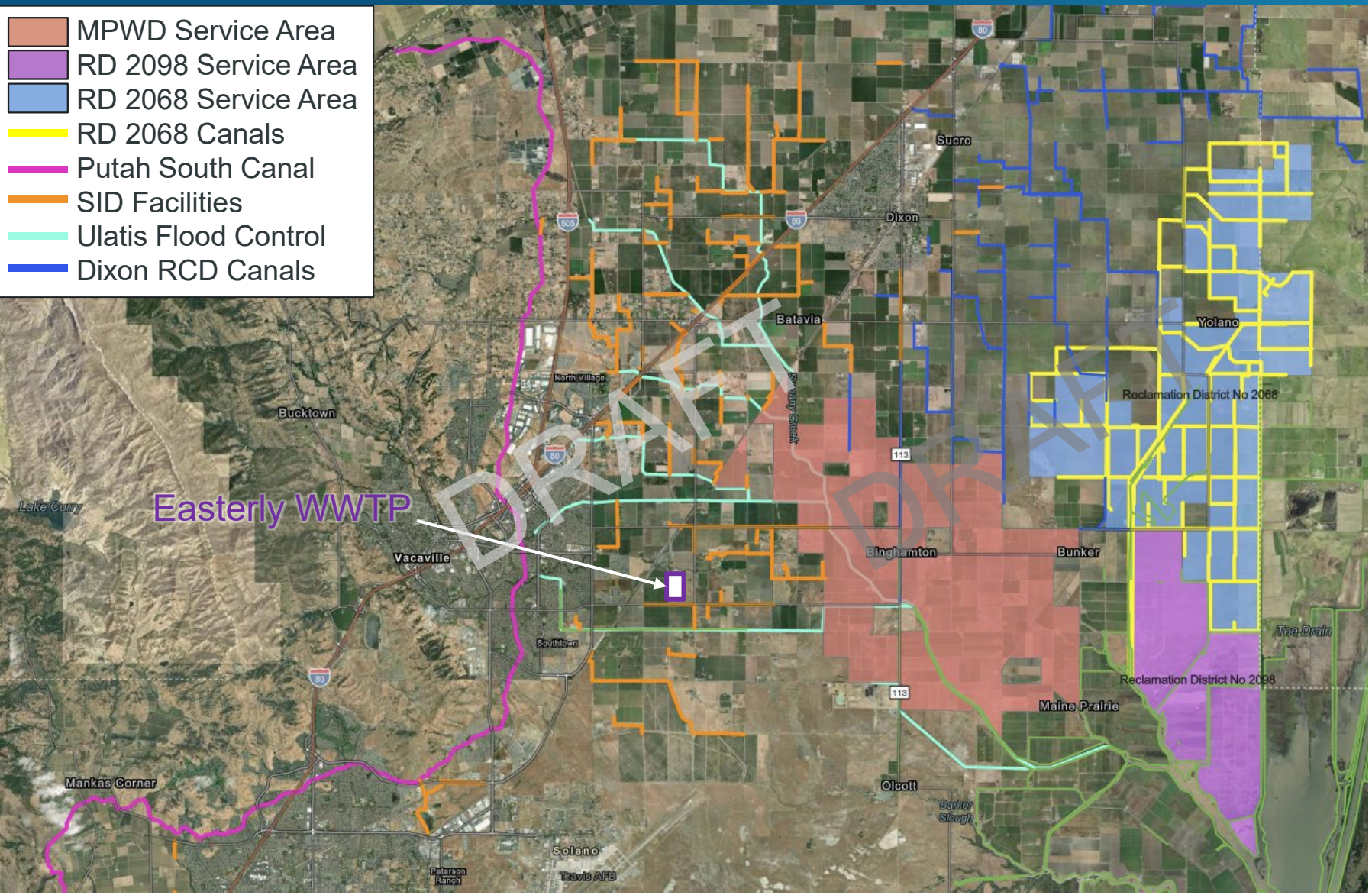
Flood Control & Drainage

Regional Water Conveyance – Putah South Canal



- **Delivery of Solano Project Water**
- Proximity to Putah South Canal does not guarantee access to Solano Project Water
- Solano Project place of use determined by those who bought in to access the water during project development in the 1950s
  - Existing SID Service Area
- Expanding place of use for Solano Project highly unlikely

Water Supply/Flood Control & Drainage Facilities: Ulatis Flood Control Project

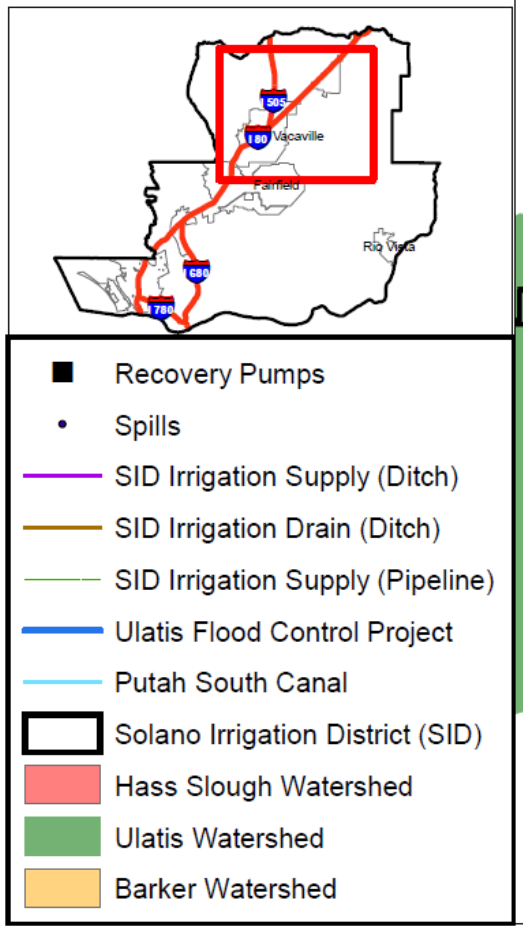


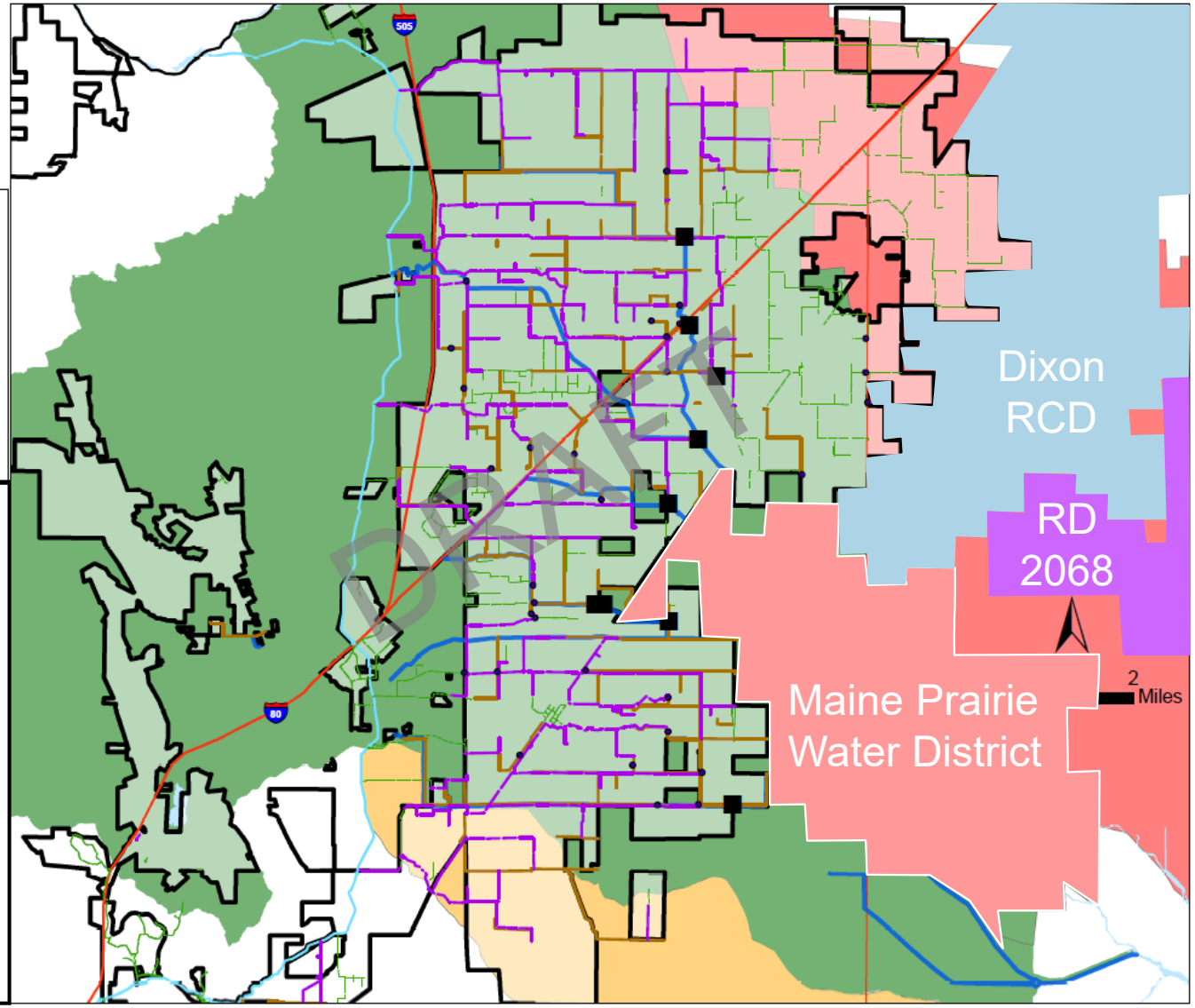
- Primary purpose for flood control – designed for 10-year event
  - SCWA responsible for O&M
  - Some portions upgraded to provide Vacaville 100-year flood protection
- Unlined w/ some vegetation to maintain slope integrity
  - Clearing of trees/woody vegetation and dredging required to maintain capacity
- Some channels used by SID for irrigation conveyance to MPWD?
- Some segments used to convey treated effluent from Vacaville's Easterly WWTP to Cache Slough via the New Alamo Channel

Water Supply/Flood Control & Drainage Facilities: Solano Irrigation District

Figure 5 - SID Facilities (North County)

Source: Dixon Regional Watershed JPA





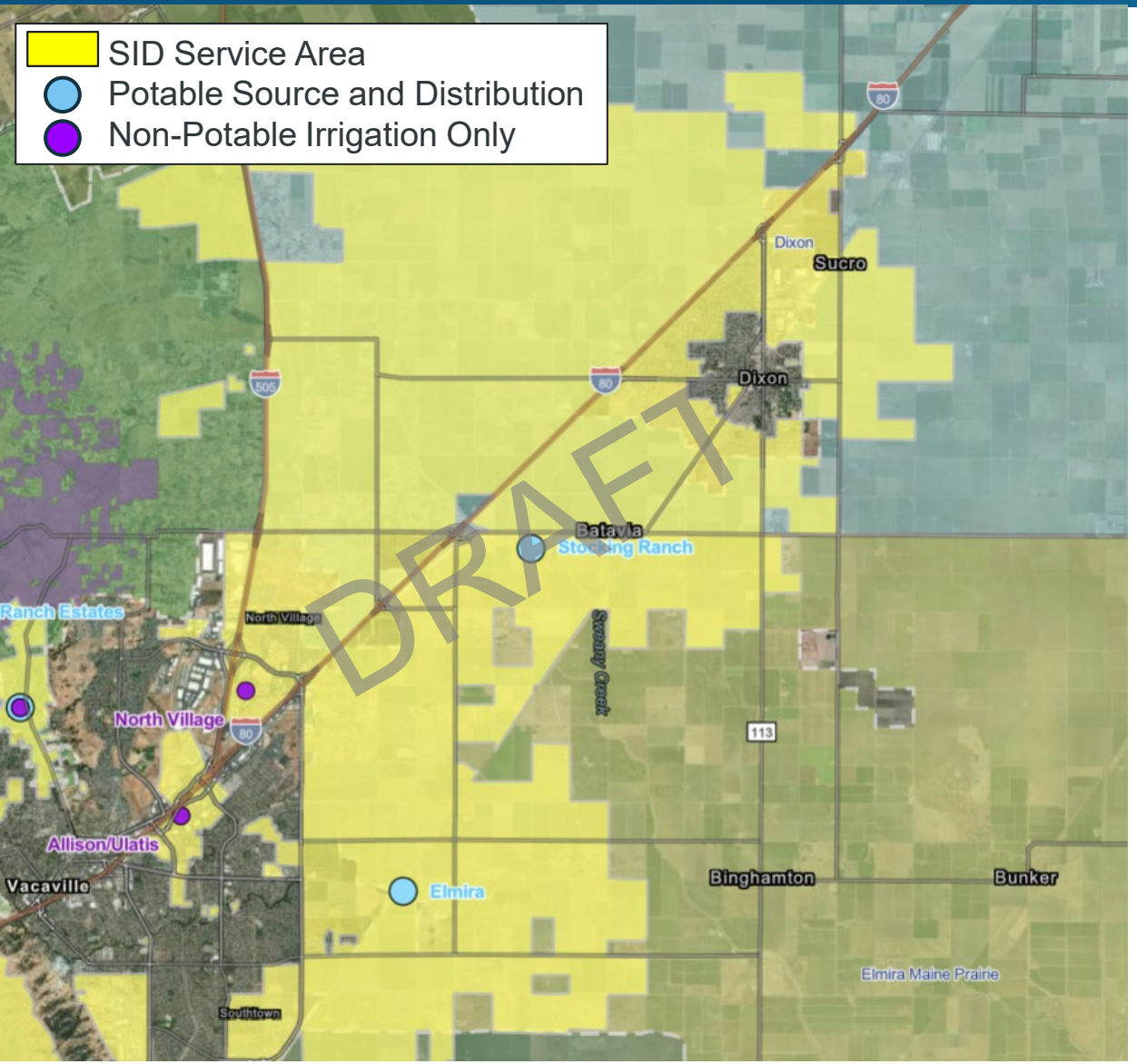
Water Supply

- Convey Solano Project Water from Putah South Canal
- Connect to Dixon RCD irrigation canals
- Not sized for winter drainage

Flood Control & Drainage

- Drainage facilities designed and intended to convey summertime loads
  - Law does not allow for imported water to be drained across adjacent property owners
  - Wintertime loads are incidental and dams in place to prevent drainage to Ulatis

Solano Irrigation District: Service Area and Water Systems



SID Small Systems in Elmira Maine Prairie Ag Area:

- **Elmira**
  - Public, potable source/distribution
  - 88 potable connections
  - Need back-up to well; SID has agreement with Vacaville for back-up supply
- **Stocking Ranch**
  - Public, potable source/distribution
  - 6 potable connections
  - Need new well, existing is near failure; small rate base
- **Agricultural service to individual parcels**

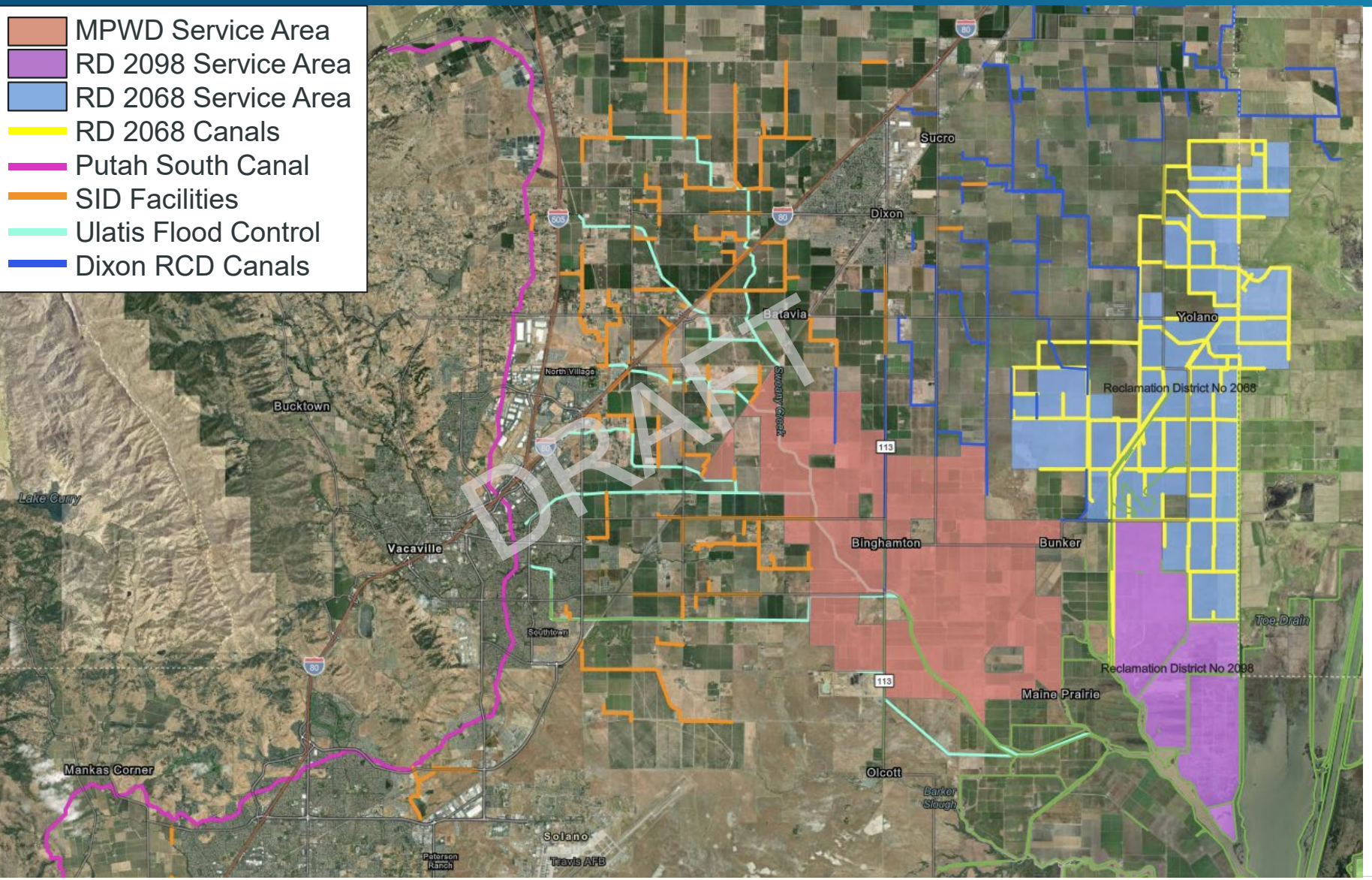
SID Small Systems in Dixon Ag Area:

- **Agricultural service to individual parcels**

SID Small Systems in Vacaville:

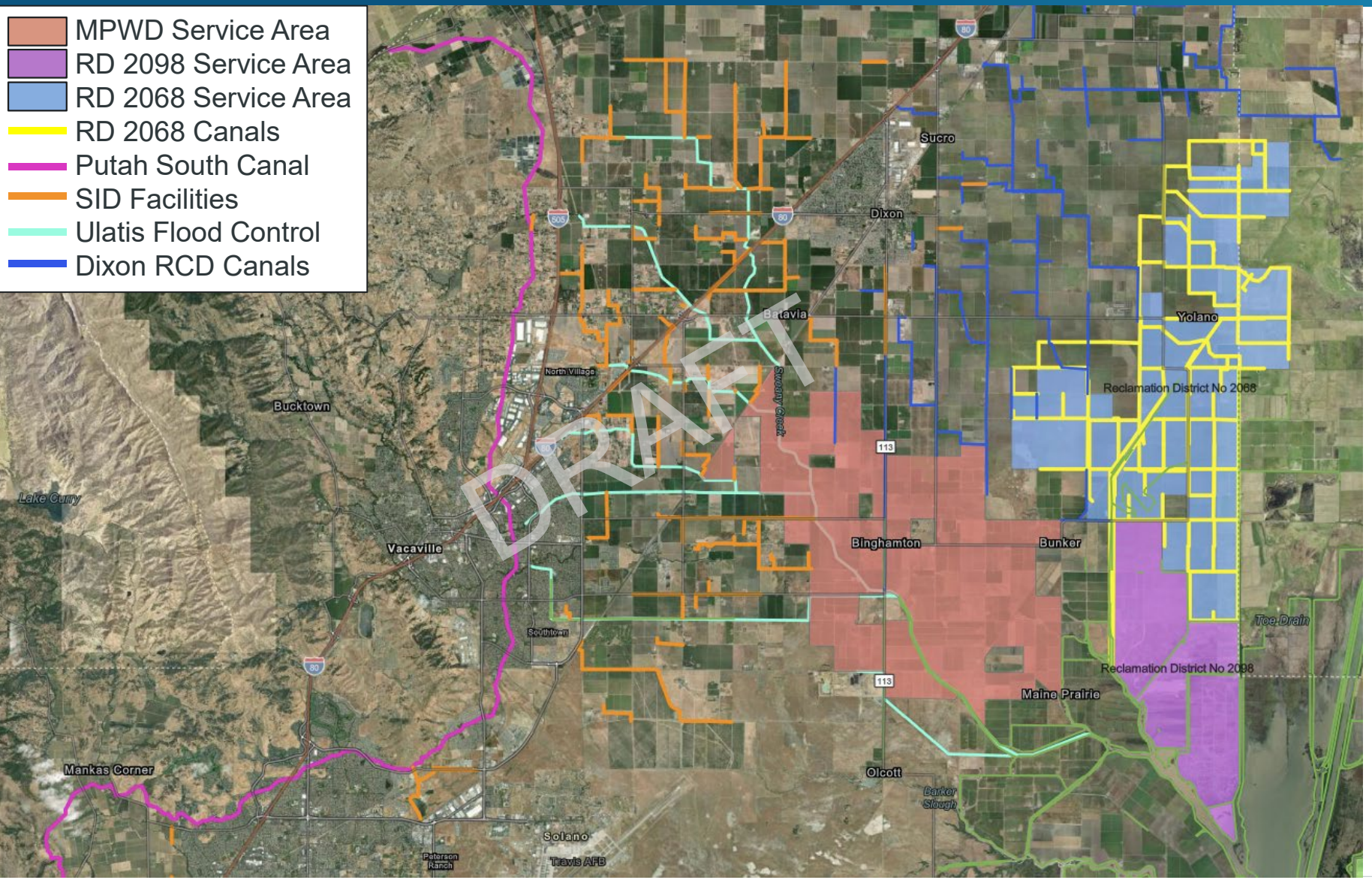
- **North Village**
  - Non-public, non-potable irrigation (31 connections)
  - Vacaville provides potable source/distribution
- **Allison/Ulatis**
  - Non-public, non-potable irrigation (41 connections, all commercial)
  - Vacaville provides potable source/distribution

Water Supply/Drainage Facilities: Maine Prairie Water District



- Provides agricultural irrigation water from Solano Project and incidental drainage water from Ulatis and SID channels
- 25+ miles of unlined canal/ditch systems (not mapped), which capture/convey tailwater from agricultural customers' fields to other customers.
  - Owned by landowners but maintained by MPWD
- Post-1914 appropriative water rights for Delta supply not currently being used

Water Supply/Drainage Facilities: Reclamation District 2068

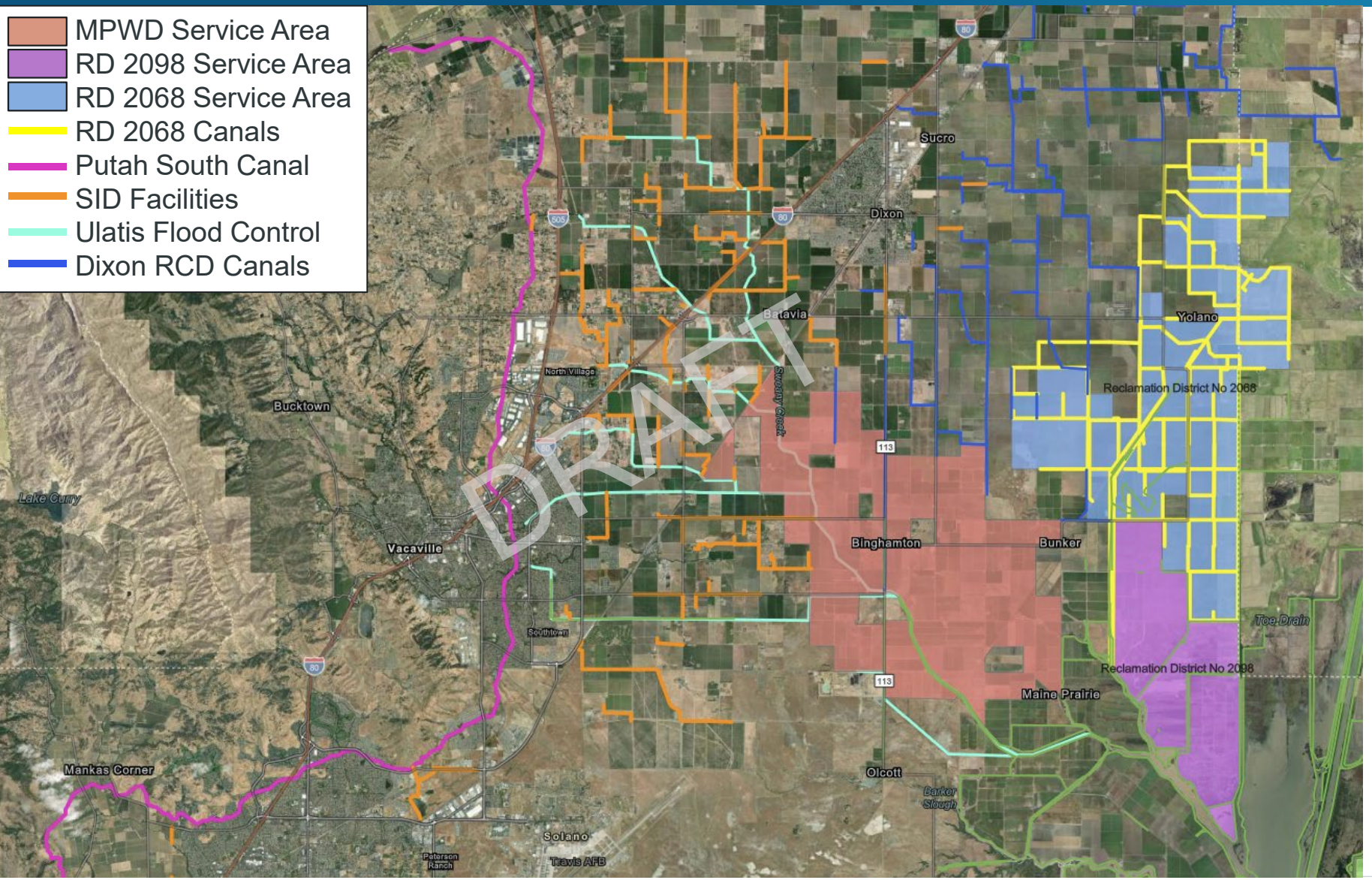


~100 miles of irrigation and drainage canals for agricultural purposes

Water Supply

- Water supply system for agricultural uses that consists of four pumps that supply an open canal gravity-feed distribution system
- Appropriative water rights principally from the Sacramento River
- 1 groundwater well that can be used to supplement water supplies.

Water Supply/Flood Control & Drainage Facilities: Reclamation District 2068

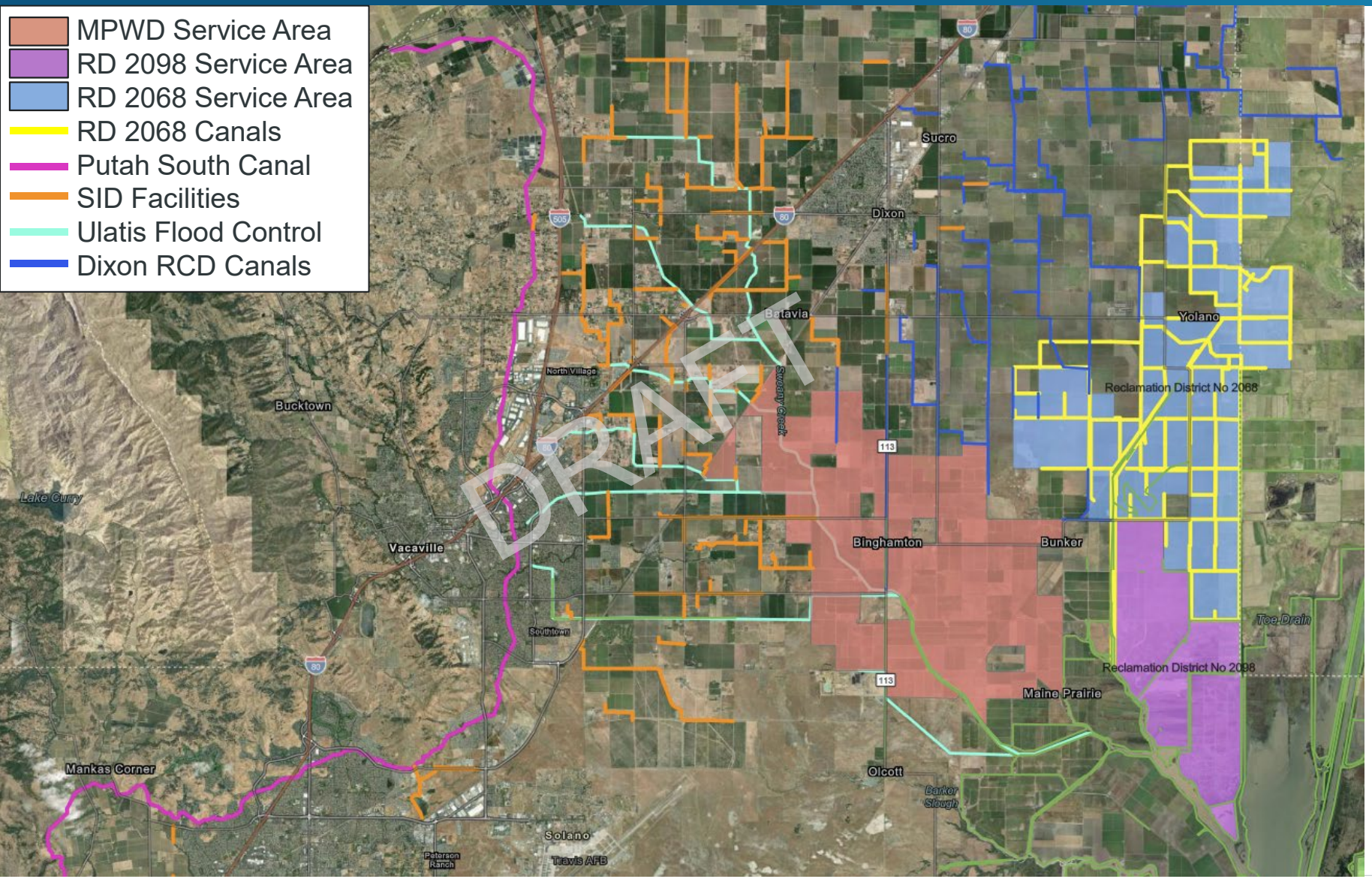


~100 miles of irrigation and drainage canals for agricultural purposes

Flood Control & Drainage

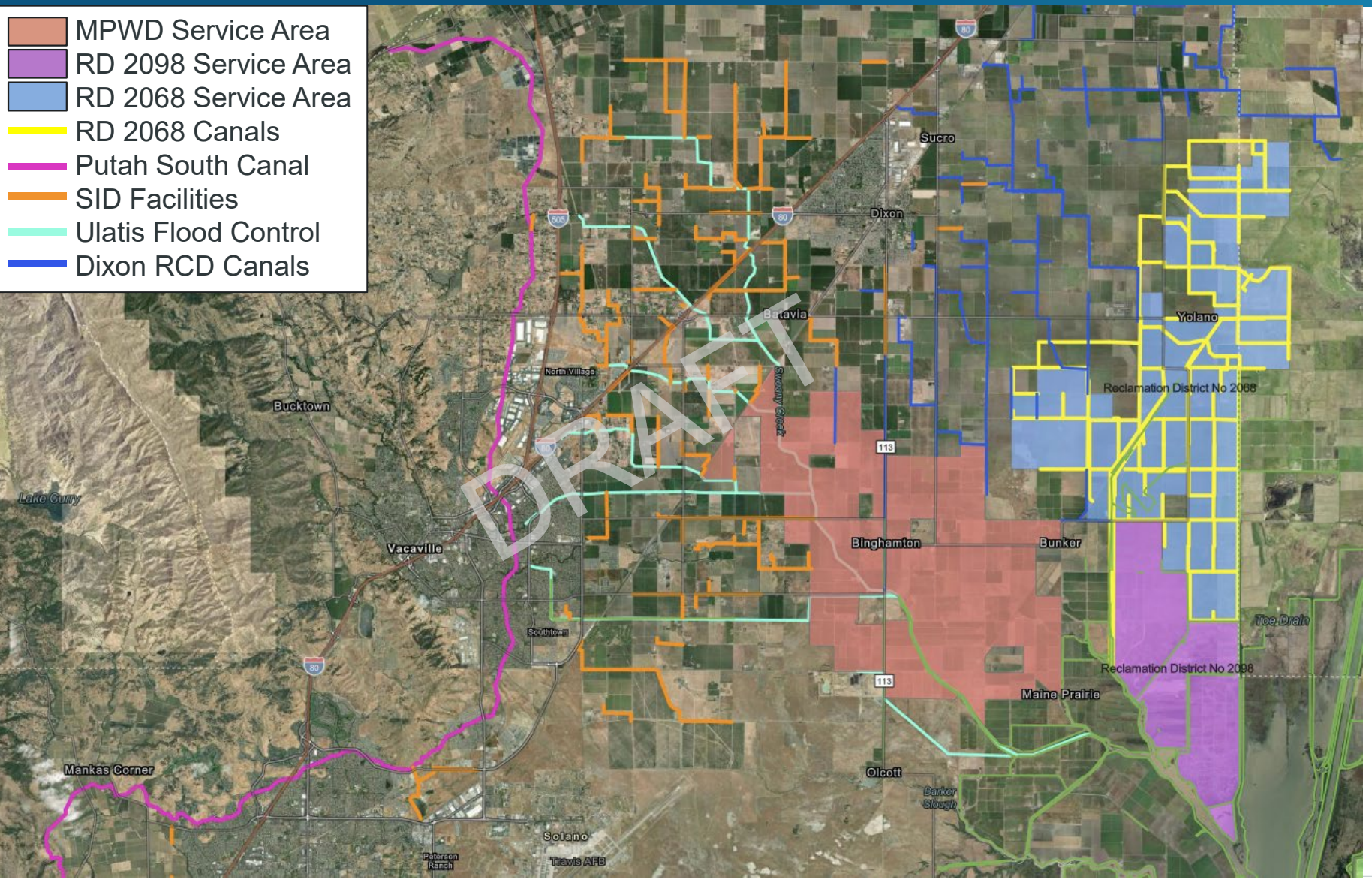
- Not designed for specified level of flood protection; intended to facilitate irrigation and storm drainage
- Maintains the federal Sacramento River Flood Control Project Levees
- Operate and maintain other drainage facilities that drain into the Cache Slough/Lower Yolo Bypass area.

Flood Control & Drainage Facilities: Reclamation District 2098



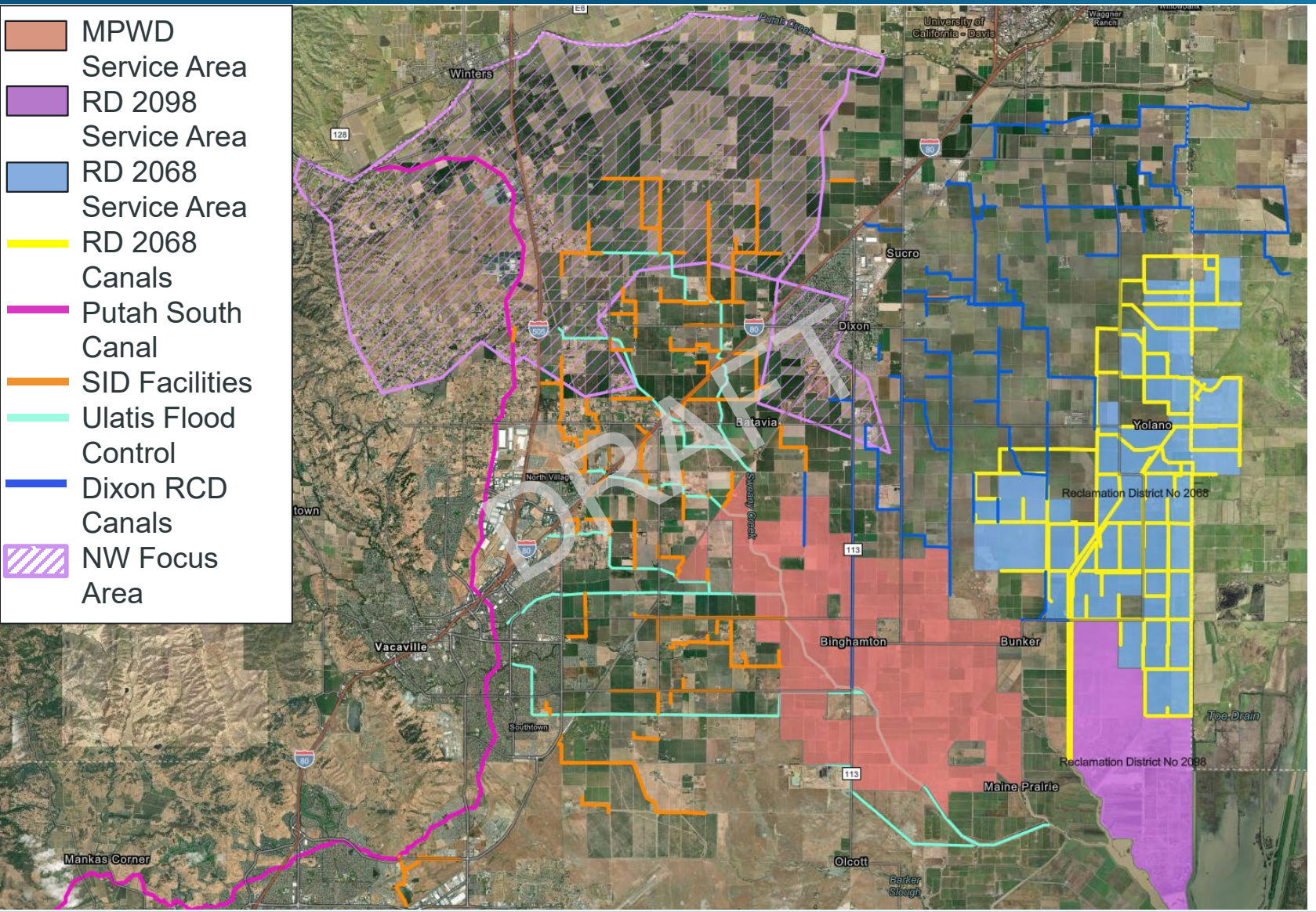
- Provides flood protection and drainage management
- Maintains the federal Sacramento River Flood Control Project Levees
  - Does not own any drainage facilities, canals, pumps, etc. not directly associated with Project Levees
- Contract administration by RD 2068

Water Supply/Flood Control & Drainage Facilities: Dixon RCD



- Connected to SID facilities
- Formed to construct, operate, and maintain the Dixon Drain and a network of 70 miles of ditches to prevent flooding on agricultural lands
  - Dixon Drain originally design to remove only winter water but also collect irrigation tailwater in spring and summer
- Leads, facilitates, and provides technical assistance to flood planning projects
- Participates in the Dixon Regional Watershed Management Plan and MOU w/RD 2068, MPWD, and City of Dixon (Dixon Regional Watershed JPA)

Groundwater Conditions – Northwest Focus Area



Identified in the Solano Subbasin GSP as a localized area of the Subbasin in which **groundwater levels remain depressed.**

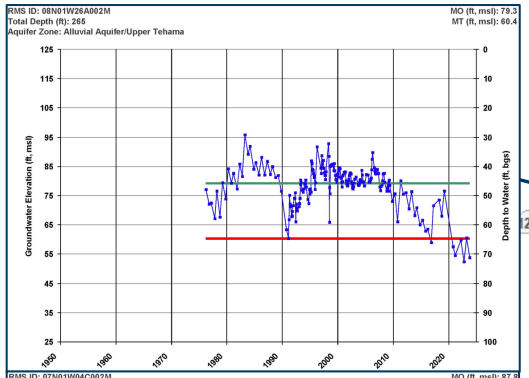
- Primarily used to meet agricultural demands.
- Only a portion of the NW Focus Area is within SID or City of Dixon service areas.
- Solano Subbasin GSP Collaborative has agreed to prioritize activities to help restore GW levels in the NW Focus Area and maintain sustainable pumping to meet agricultural demands.

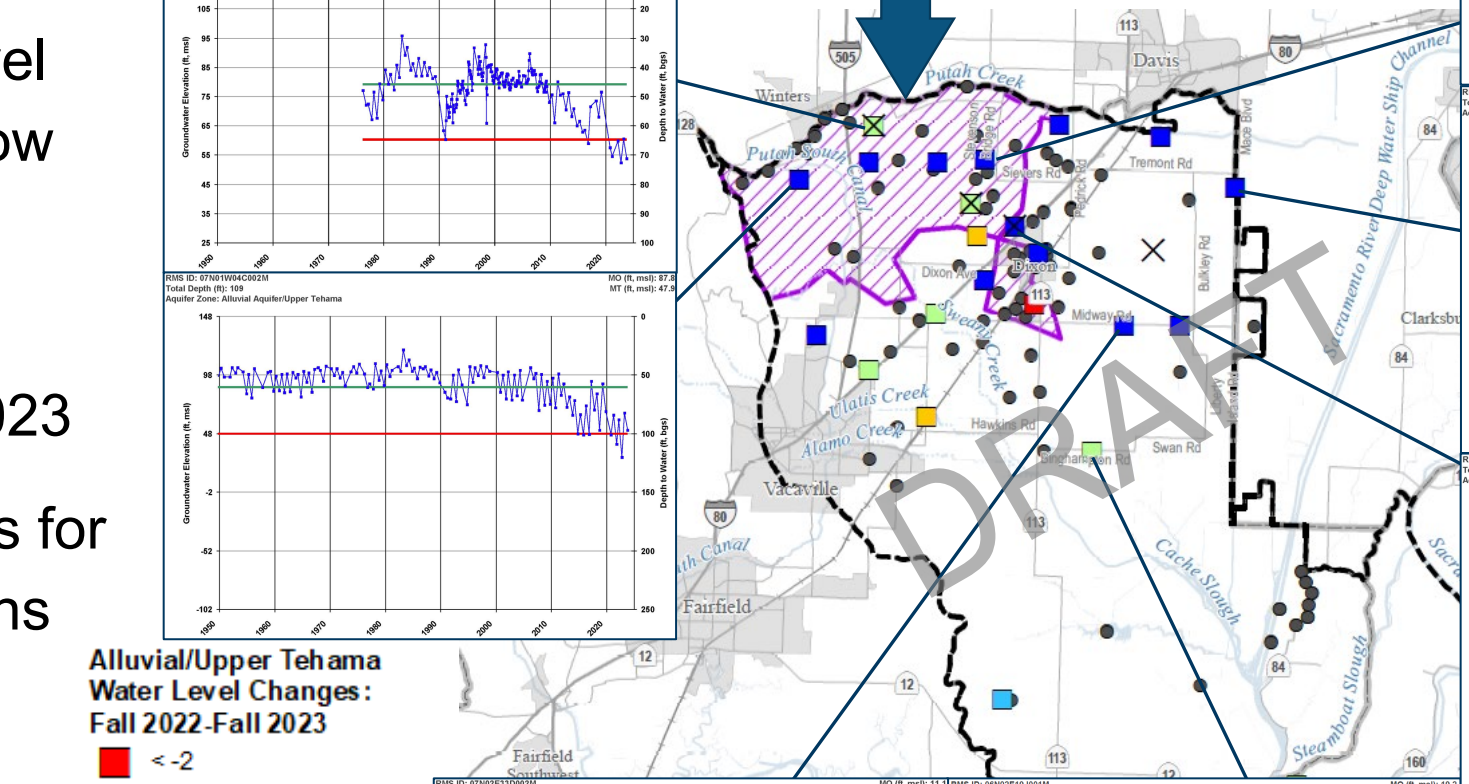
Northwest Focus Area boundaries are approximate based on generalized trends and conditions.

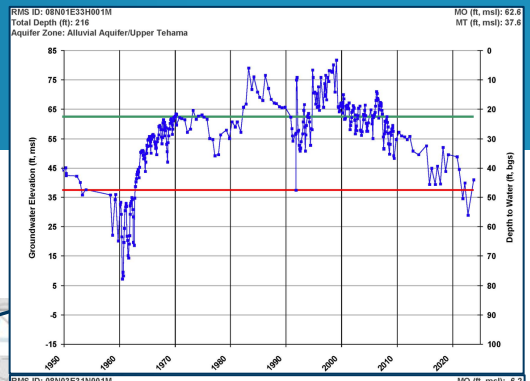
Fall 2023 Water Level Update

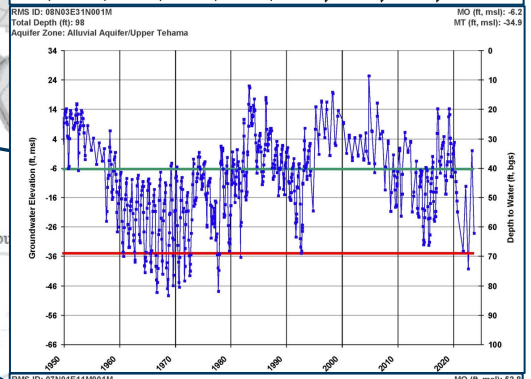
- NW Focus Area delineated because of recent GW level declines in shallow zone
- Some recovery evident in WY 2023
- Area of emphasis for tracking conditions and enhancing groundwater recharge

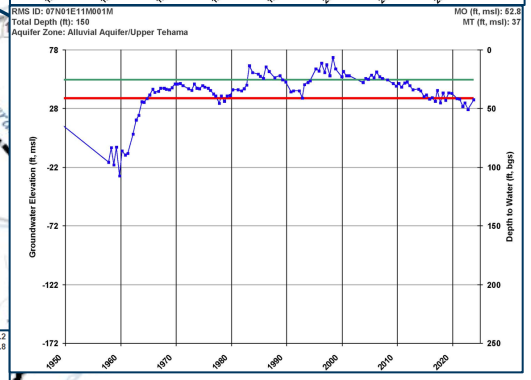
Northwest Focus Area (2022 Solano GSP)





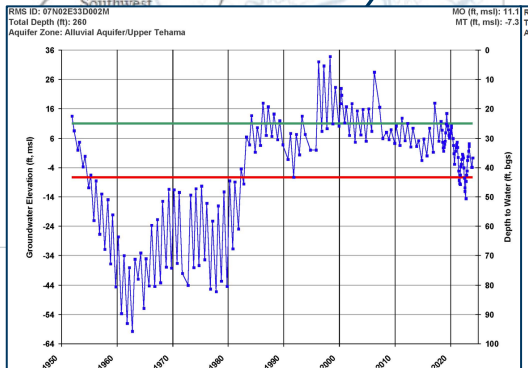


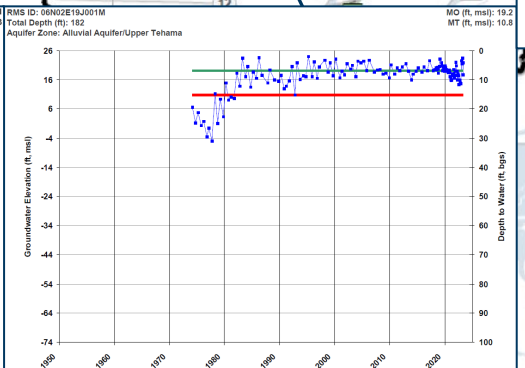




Alluvial/Upper Tehama Water Level Changes: Fall 2022-Fall 2023

- < -2
- -2 - 0
- 0 - 2
- 2 - 5
- >5
- RMS with 2023 MT Exceedance
- Supplemental Monitoring
- NW Focus Area
- Solano Subbasin

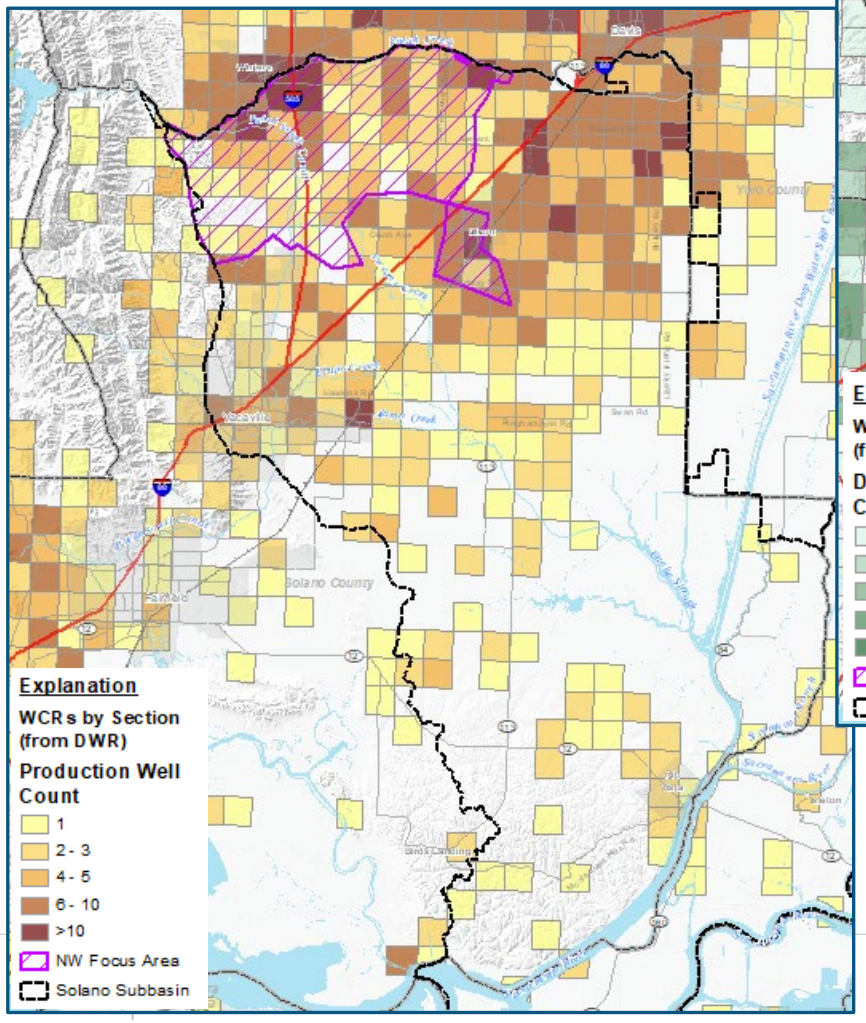




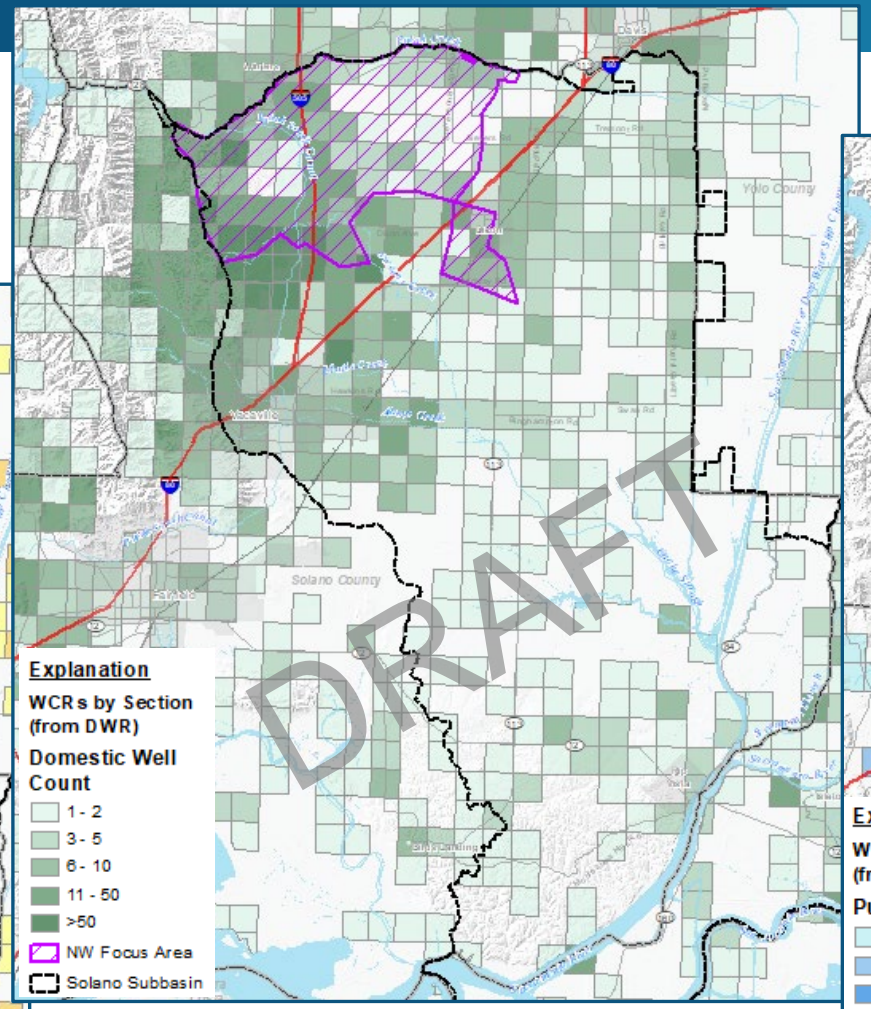
Measurable Objective (ft, msl)
Minimum Threshold (ft, msl)

Groundwater Use

Ag and production wells

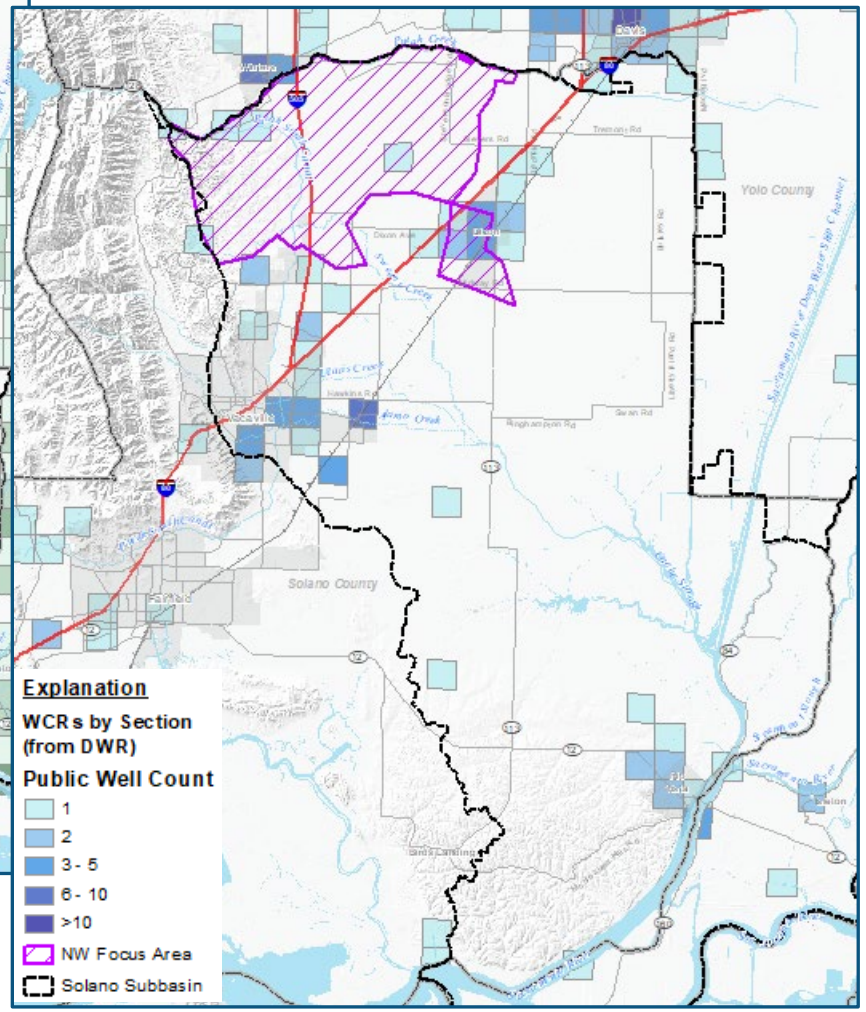


Domestic wells



- Higher ag and domestic well density in northern Subbasin

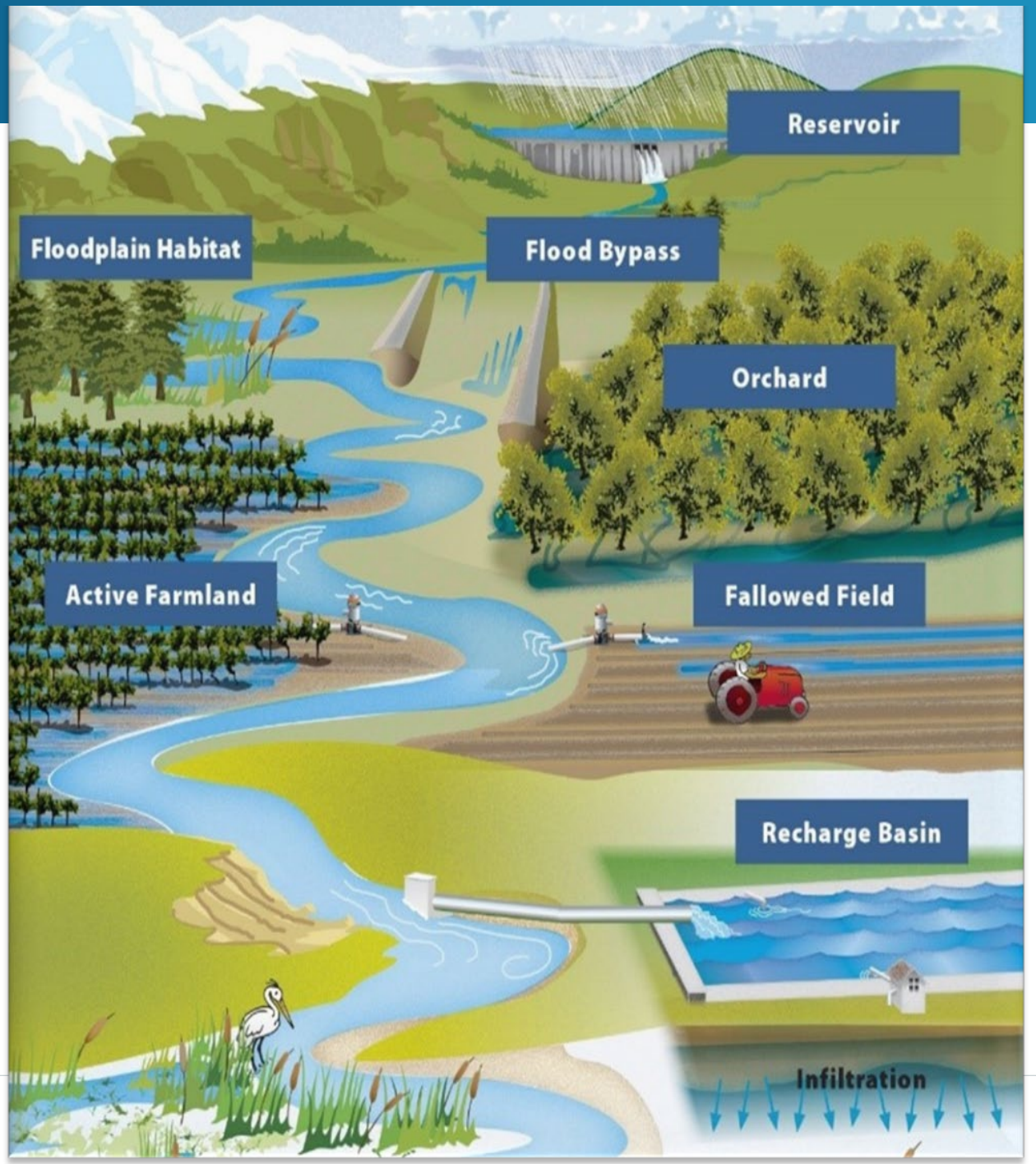
Public supply wells



- Localized areas of higher public water system well density around urban areas

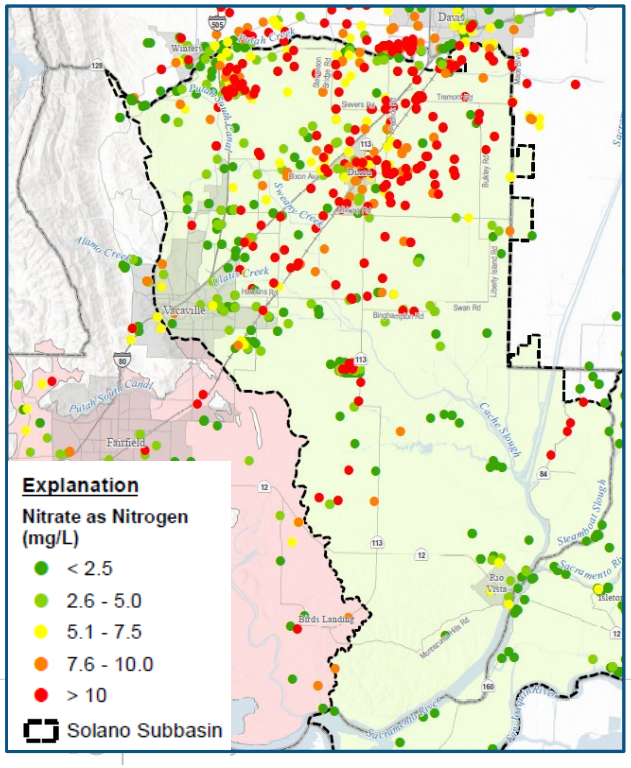
Northwest Focus Area Activities

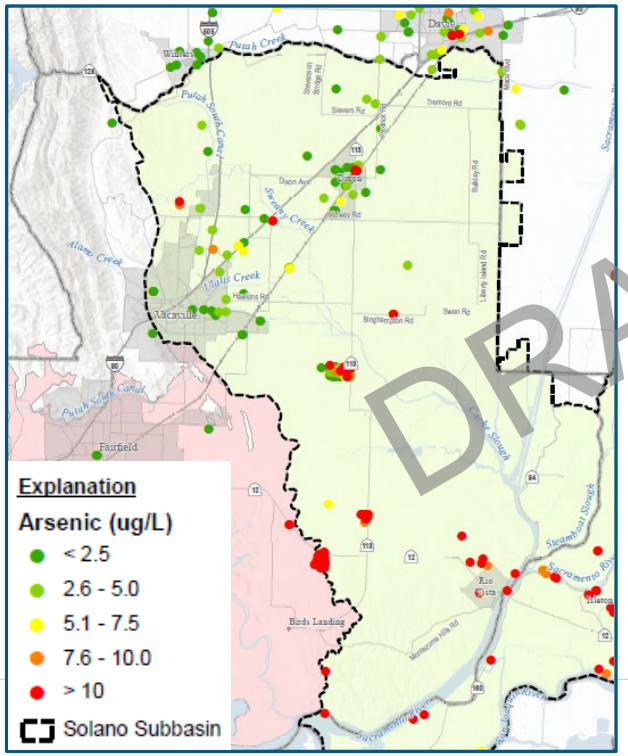
<u>Focus on multi-benefit projects and management actions:</u> groundwater recharge and stormwater management

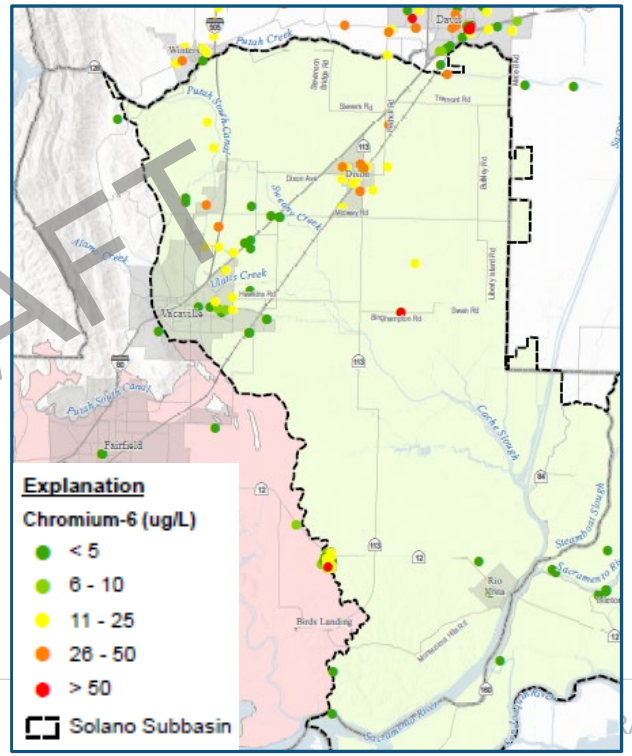


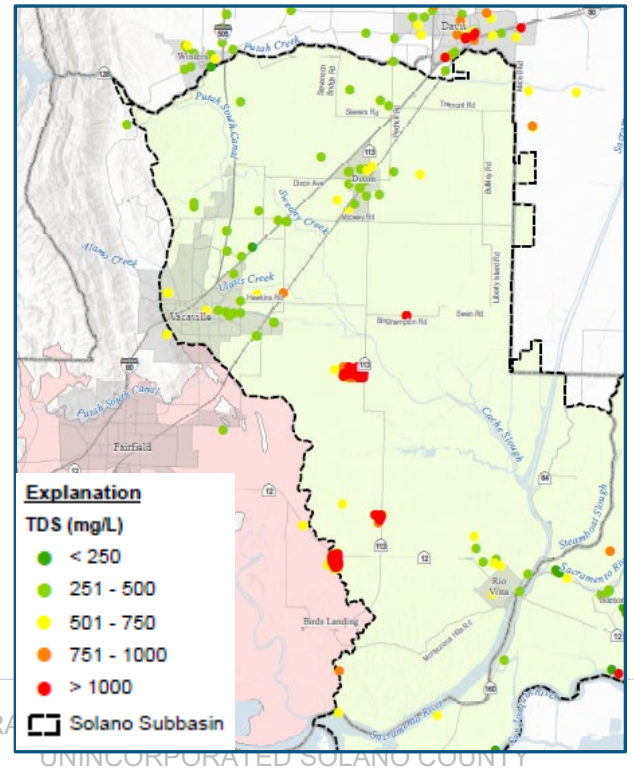
Groundwater Quality Conditions

- Five identified constituents of interest in the GSP
  - Nitrate: areas of high concentrations, primarily in northern Subbasin; sources include fertilizers, septic/wastewater, local contamination
  - Arsenic: naturally occurring, more common in southern Subbasin
  - Chromium-6: naturally occurring, new MCL of 10 µg/L
  - TDS: indicator of salinity, locally high in some areas; Chloride: for tracking saline intrusion

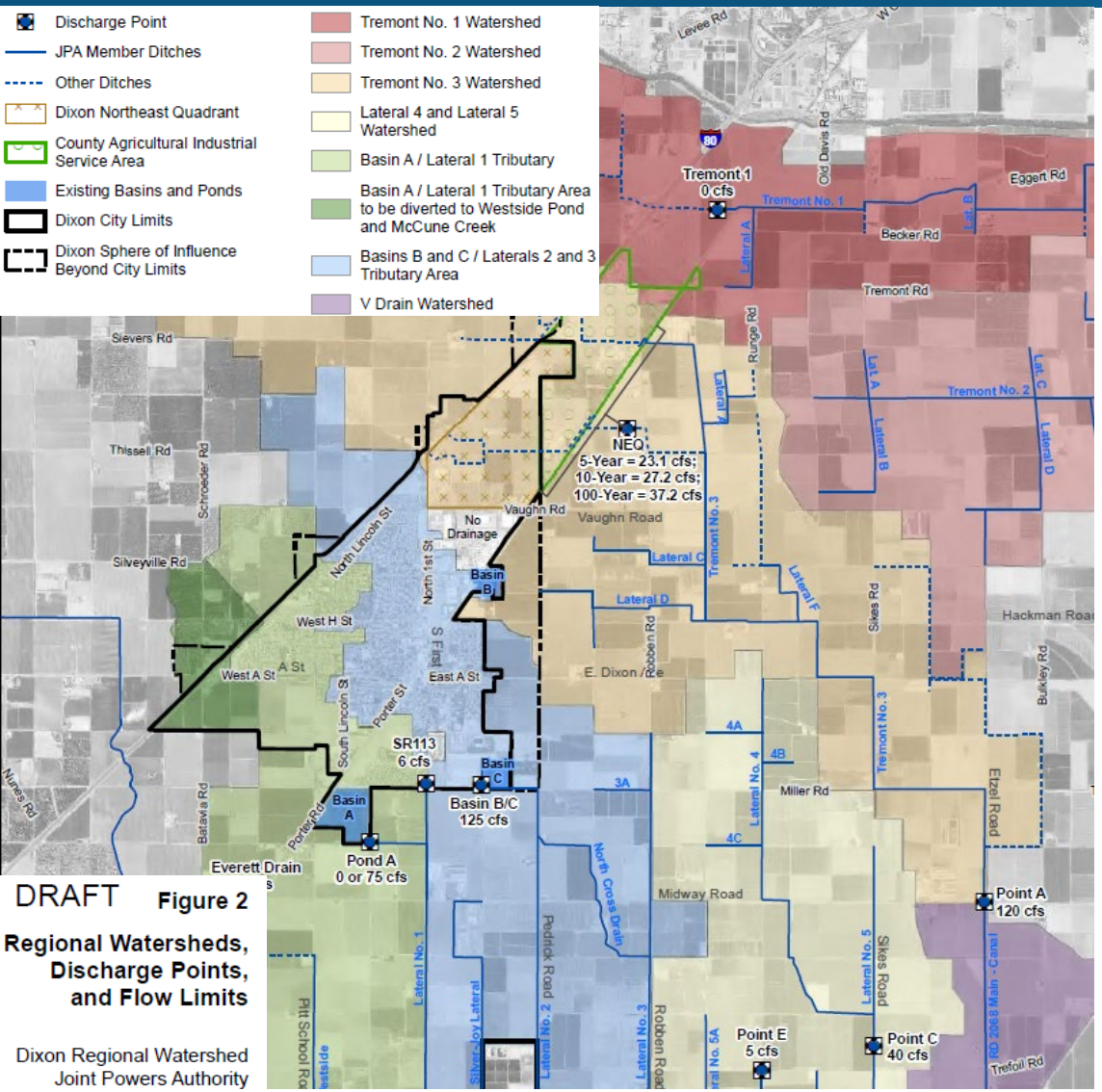








Tremont 3 Watershed Regional Drainage Project



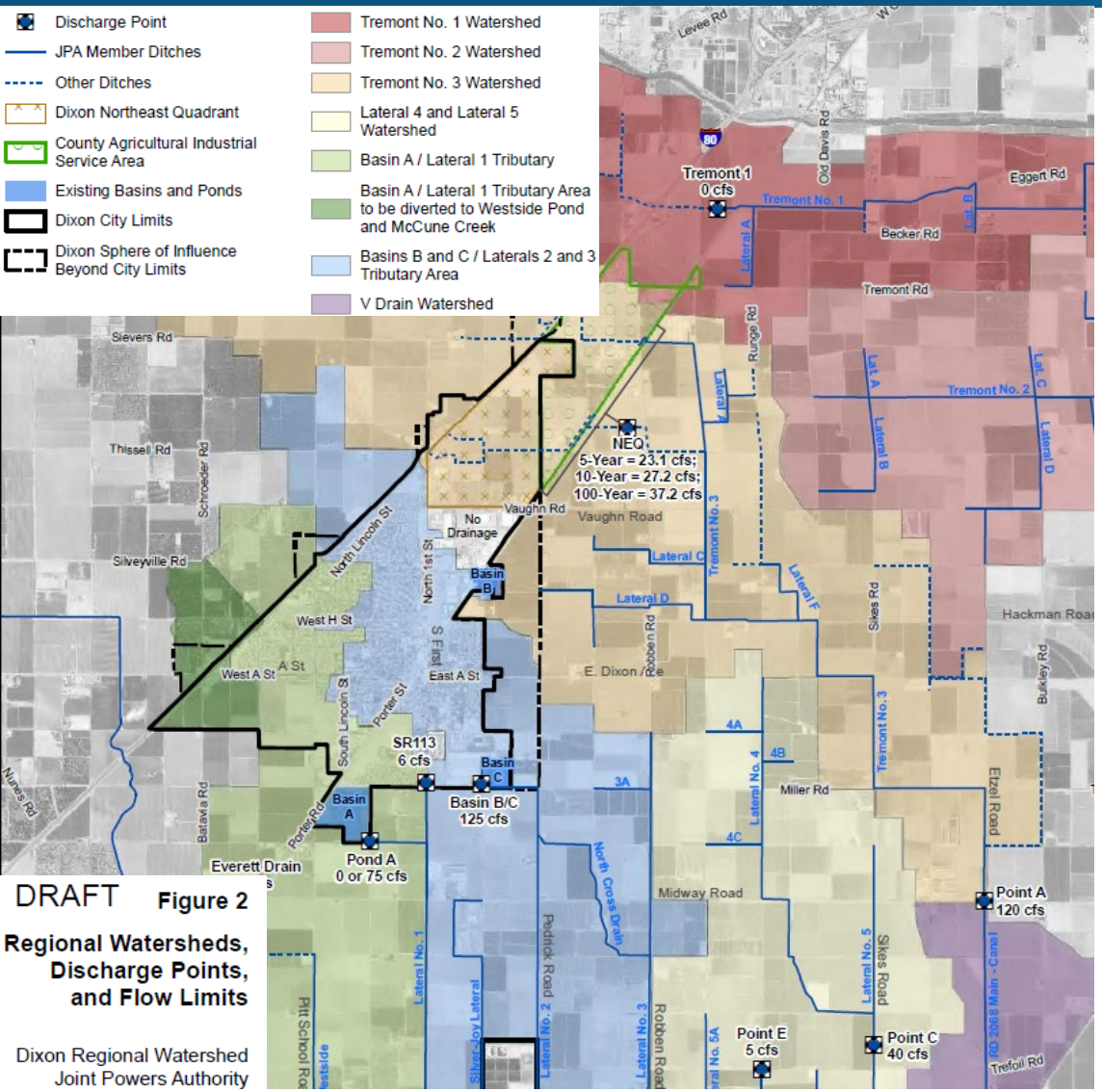
DRAFT **Figure 2**

Regional Watersheds, Discharge Points, and Flow Limits

Dixon Regional Watershed Joint Powers Authority

- SCWA + Dixon Regional Watershed JPA (Dixon RCD, RD 2068, Maine Prairie Water District, City of Dixon)
- Problem:
  - Agricultural drainage systems in lower watershed are too small for flow from large ag area in upper watershed.
  - Persistent drainage flooding issues downstream in the lower watershed.
  - Excess flows run SE through Dixon RCD to RD 2068 and RD 2098
    - In wet winters, ponding occurs in RD 2068/RD 2098 as soils do not percolate quickly enough and the opportunity for discharge to the Sacramento River is limited

Tremont 3 Watershed Regional Drainage Project



DRAFT **Figure 2**

Regional Watersheds, Discharge Points, and Flow Limits

Dixon Regional Watershed Joint Powers Authority

- Phase 1 – Background and Baseline (2019-2020)
- Phase 2 – Holistic Regional Study (2021-2022)
- Phase 3 – Feasibility/Design of Regional Solution (ongoing)
  - Currently evaluating Dixon existing and buildout conditions
  - Next steps will evaluate opportunities outside Dixon:
    - Putah Creek Diversion Channel?
    - Upper Watershed Detention Basins/Increased infiltration over large area
    - Other/Yet to be determined

Challenges: Water Supply/Flood Control & Drainage (Discussion)

- Challenges:
  - Unclear drainage/flood management responsibilities
    - Complex creek maintenance permitting
  - Lack of clear opportunities for recharge/detention of excess surface flows
    - Lack of properties/landowners willing to pilot recharge/detainment?
  - Outdated hydraulic models and lack of data and funding to update
  - Cr6 and Nitrate in groundwater
  - Declining GW levels in and around NW Focus Area
  - Limited municipal water services for areas outside of cities (such as Dixon Limited Industrial Land and North Vacaville Limited Industrial Land)

Challenges: Water Supply/Flood Control & Drainage (Discussion)

- Data Gaps
  - Compiled mapping/metadata:
    - Water service provider boundaries/infrastructure and spheres of influence
    - Flood/drainage infrastructure, agency boundaries/responsibilities
    - Solano Project demands and location of use
    - Property owners along creeks/drainages
    - Flood events/impacts including location/extent of flooding, date and duration, cause, impacts, and mitigation/recovery costs
    - Condition assessment/performance evaluation of existing drainage/flood infrastructure

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  - Magnitude of costs for new water supply conveyance infrastructure

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    - Condition assessment/performance evaluation of existing drainage/flood infrastructure
  - Magnitude of costs for new water supply conveyance infrastructure
  - Data to support feasibility study of managed aquifer recharge (MAR)
    - Landowners interested in participating in MAR?
    - Crops that can tolerate or benefit from long durations of standing water?
    - Field data for recharge rate of soils and areas for recharge?
    - Studies examining the effects of land use history, climate, land management practices, and irrigation systems on nitrate leaching through MAR?

Completed & Ongoing Actions: Water Supply & Conveyance (Discussion)

- NW Focus Area – groundwater monitoring and recharge studies (SGMA)
  - Related to Dixon Regional Watershed JPA efforts
  - Outreach to growers and landowners RE: MAR and monitoring wells
- Solano County GIS updates
  - Compiling information, including metadata for infrastructure
    - Working with GSAs for well and water intake database/mapping to track well construction
- Solano County Drought Resilience Plan
  - Conduct Risk Assessment based on physical and social vulnerabilities to ID water supply shortages

Completed & Ongoing Actions: Flood Control & Drainage (Discussion)

- Solano County
  - Existing standards
    - Chapter 12.2 FLOOD DAMAGE PREVENTION
    - Chapter 31 GRADING, DRAINAGE, LAND LEVELING, AND EROSION CONTROL
  - GIS Updates: Compiling information, including metadata for infrastructure
    - Including County roadside drainages
- Solano County Strategic Initiative for Agriculture – just starting
  - Economic development to support ag via water, housing, and energy
- Tremont 3 Watershed Regional Drainage Project – Phase 3
- Solano Subbasin GSP/SGMA Recharge Investigations
  - Soliciting grower interest and pilot locations, cover crop studies, and monitoring wells
  - Quantifying benefits
  - Map facilities

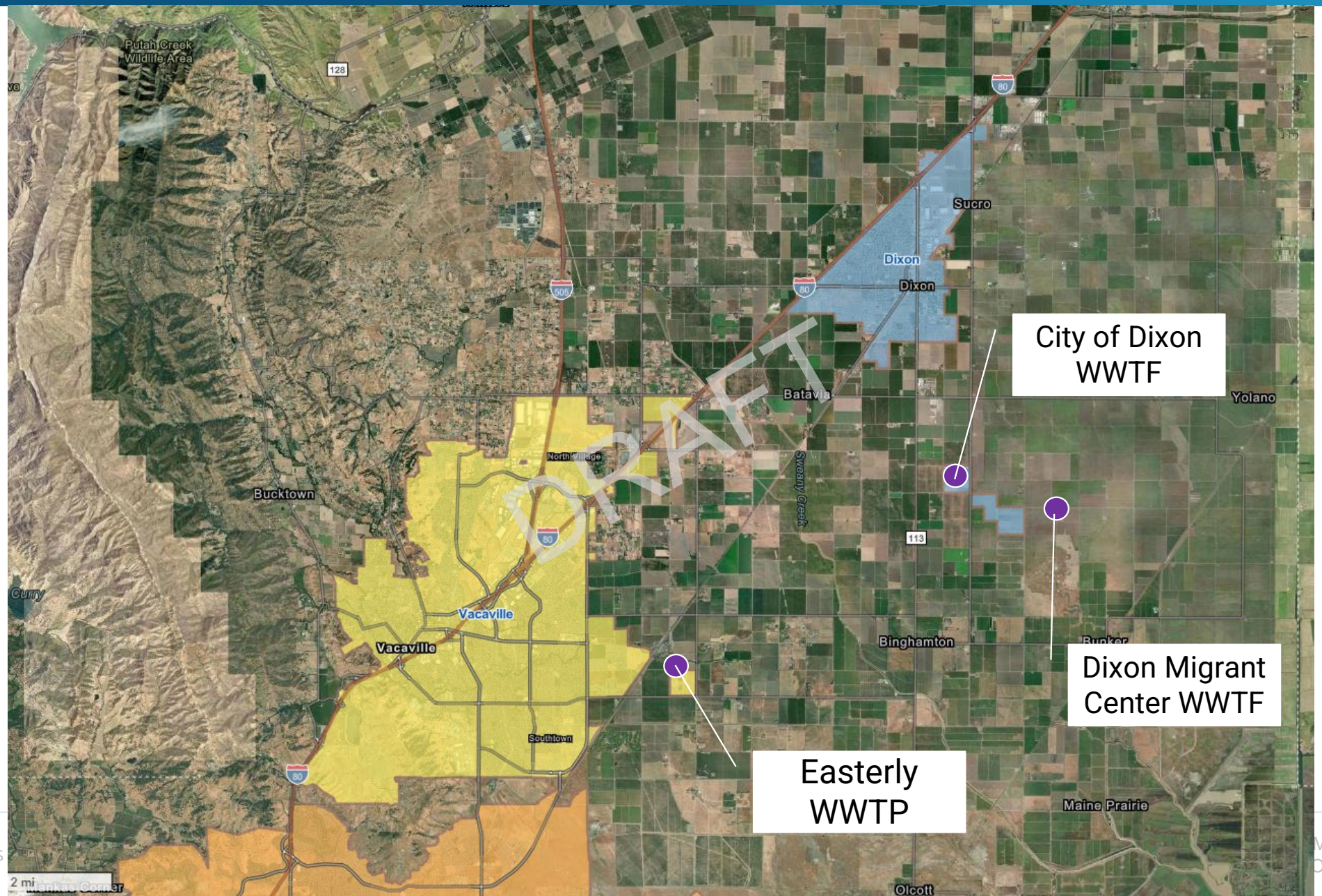
Potential Future Actions: Water Supply/Flood Control & Drainage (Discussion)

- Continue compilation of GIS data/metadata for infrastructure
- Regional Drainage Solution
  - Build on Tremont 3 Watershed Regional Drainage Solution
  - Evaluate options to detain excess stormwater up-watershed or convey to NW Focus Area
  - Modify operations of proposed detention basins w/in NEQ
  - What agricultural practices improve infiltration/reduce runoff
    - Field testing/pilot studies
  - Evaluate targets for retention on a per-acre basis
    - Hydraulic/hydrologic/hydrogeologic modeling to support
- Review existing runoff management requirements/standards for implementation and effectiveness

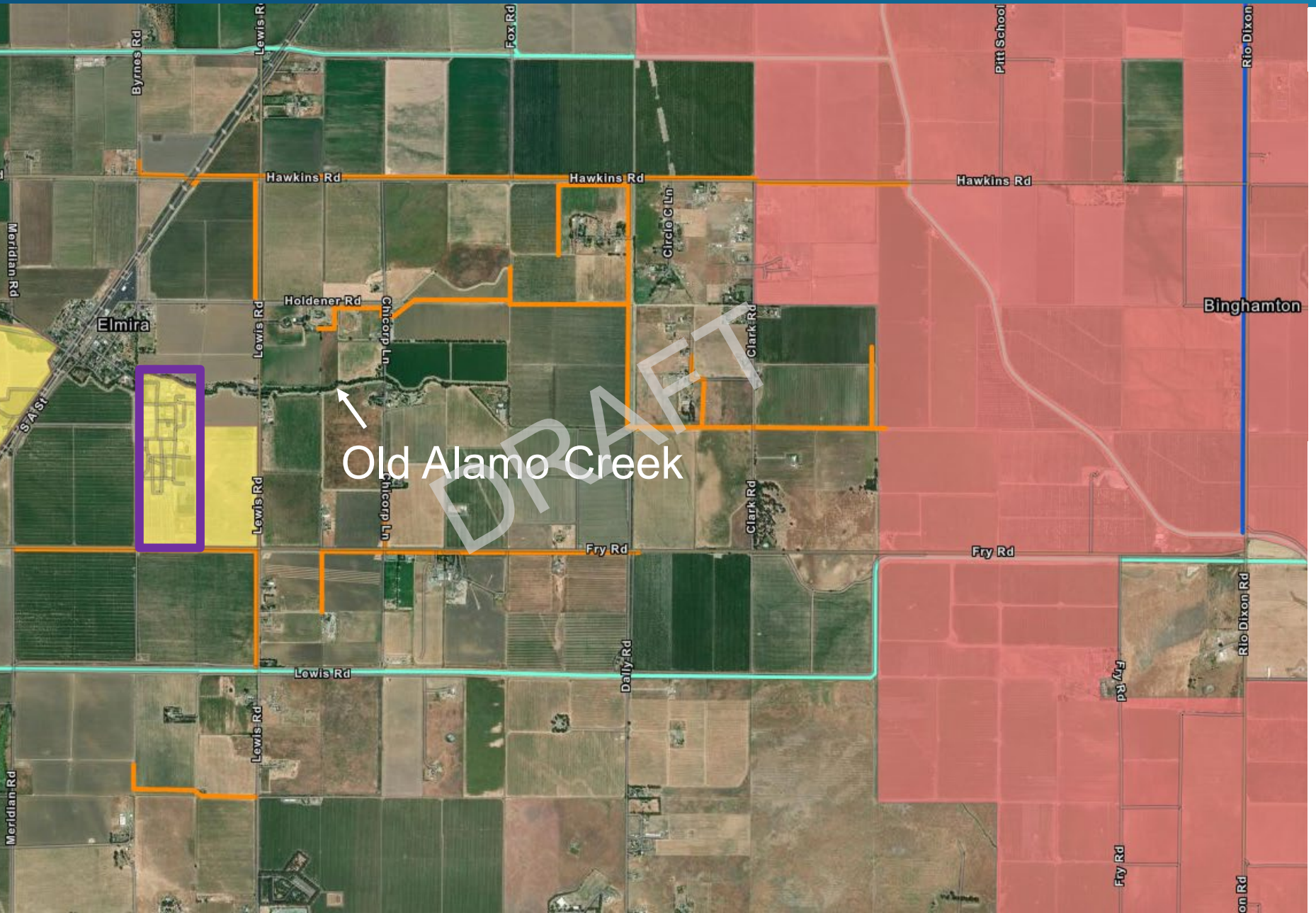
Overview of Eastside Area

Wastewater

Centralized Wastewater Facilities



Wastewater Facilities – Easterly WWTP (City of Vacaville)



City Of Vacaville

Maine Prairie Water District

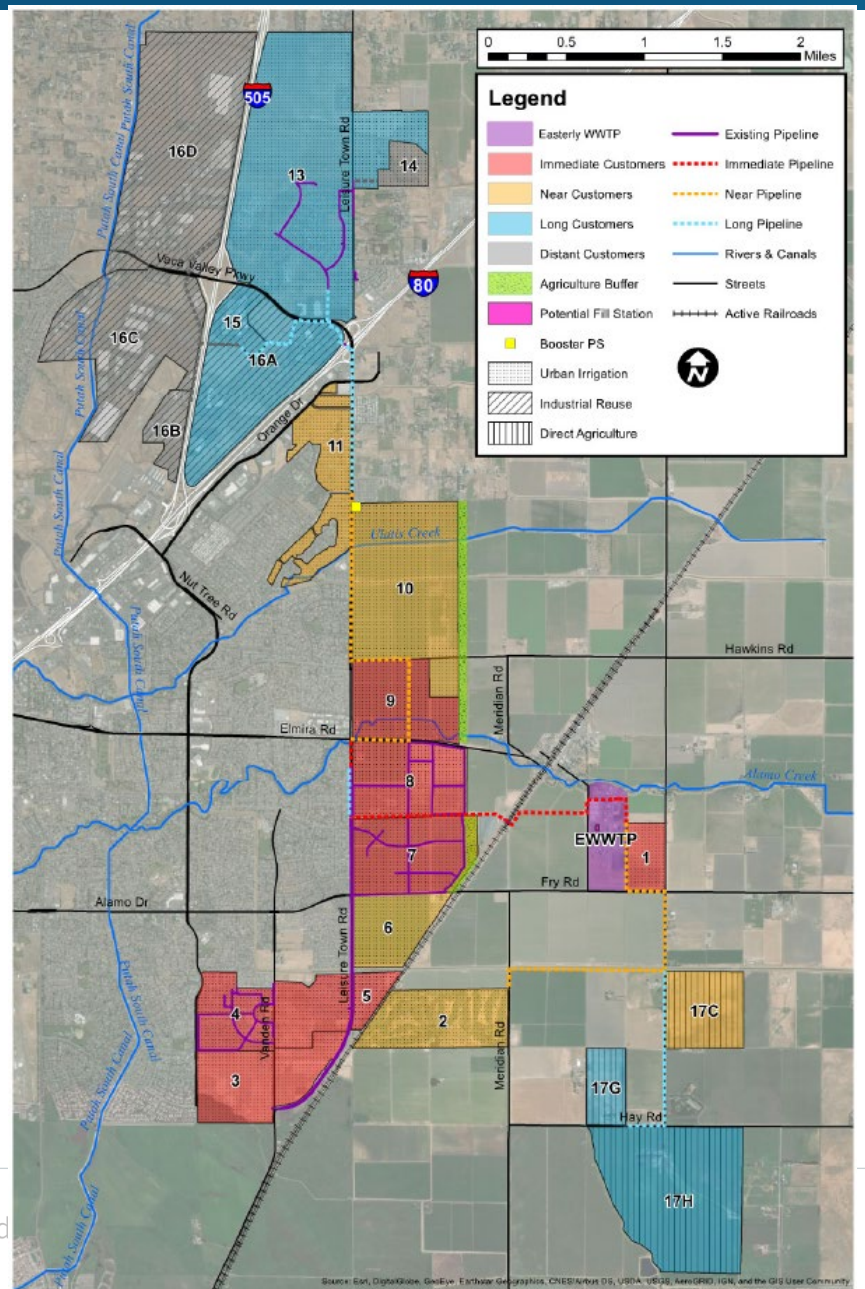
SID Facilities

Dixon Resource Conservation District Canals

Ulatis Flood Control System

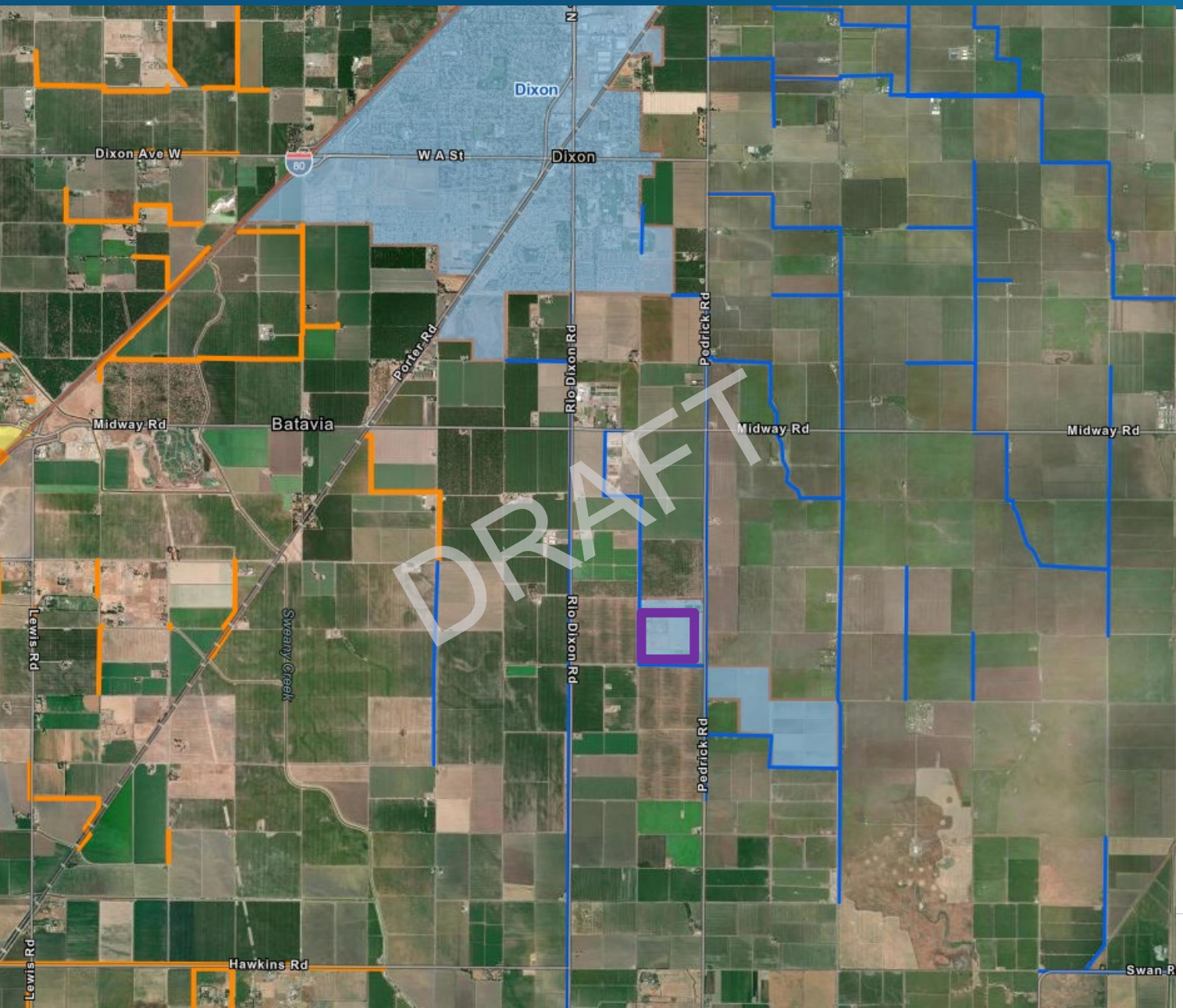
- Serves Vacaville and Elmira
- Tertiary treatment + blending
  - Filtration + advanced disinfection May 1 – Oct 31 (Title 22 discharge to Old Alamo Creek to Cache Creek)
  - Discharged 8,154 AF in 2020

Vacaville Recycled Water Master Plan



Phase	Customer ID	Customers
Immediate	1	New City Athletic Fields
	3	Vanden Meadows Development
	4	Southtown Development
	5	Southtown Commons / Moody
	7	Roberts Ranch
	8	Brighton Landing
	9	The Farm at Alamo Creek
		Downstream Diversions outside Solano County
Near	2	Cypress Lakes Golf Course
	6	East of Leisure Town Road Development (South)
	10	East of Leisure Town Road Development (North)
	11	Green Tree Development
	17C	Agricultural Customer
		Downstream Diversions in and outside Solano County
Long	13	North Village Development
	15	Genentech
	16A	Vaca Valley Business Park (excluding Genentech)
	17G	Agricultural Customer
	17H	Agricultural Customer
		Downstream Diversions in and outside Solano County

Wastewater Facilities – City of Dixon



City Of Dixon

Dixon Resource Conservation District Canals

SID Facilities

- Serves entire City of Dixon
- Treatment via unlined stabilization ponds and polishing ponds
- Discharged 1,224 AF in 2020
- No plans to produce or use recycled water (2020 UWMP)

Challenges: Wastewater (Discussion)

- Challenges
  - Limited municipal wastewater services for areas outside of cities (such as Dixon Limited Industrial Land and North Vacaville Limited Industrial Land)
  - Recycled water conveyance costs?
  - Recycled water acceptance?
- Date Gaps
  - Better mapping of wastewater service provider boundaries/infrastructure and spheres of influence
  - Information and locations for existing and potential agricultural/industrial recycled water users and barriers to implement or utilize recycled water
  - Magnitude of costs for recycled water conveyance infrastructure

Completed & Ongoing Actions: Wastewater (Discussion)

- Vacaville Recycled Water Planning

Potential Future Actions: Wastewater (Discussion)

- Other recycled water planning studies/development?

Meeting Agenda

1

INTRODUCTIONS

Purpose of the Solano One Water Framework

2

MEETING PURPOSE AND OUTCOMES

Solano One Water Recap

Meeting Purpose and Outcomes

3

EXISTING CHALLENGES AND ACTIONS

Overview of Eastside Area:

- Challenges/Needs
- Completed, Ongoing, and Potential Future Actions

4

POTENTIAL FUTURE MASTER PLAN ACTIONS

Potential Case Study Ideas

Next Steps

Potential Case Study Ideas

Discussion

Potential Case Study Ideas Eastside Solano County (Discussion)

- Eastside Solano
  1. Strategies for services outside of municipal areas
  2. Flood drainage planning, including use existing conveyances for routing excess flows to NW Focus Area
  3. Coordinated permitting for creek clearing
  4. Recharge pilot studies
  5. Regional Recycled water market assessment
  6. Others?

Potential Case Study Ideas Pleasants/Vaca Valley (Discussion)

- Pleasants/Vaca Valley
  1. Flood/drainage management planning, modeling, and administration
     - Coordinate permitting for creek cleaning on private/public properties
  2. Strategies for water/wastewater services outside of municipal areas
  3. Others?

Next Steps

- Draft Framework Chapter 4: Actions, Partnerships, and Project Concepts
- Winter SC Meeting #9: Draft Framework
  - Challenges, actions, partnerships, case study