Strategic Salt Accumulation Land and Transportation Study (SSALTS)

Task 1.3 Remaining Study Areas,

Task 1.4 Screening Approach Long-Term Sustainability

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SSALTS Objectives

- Identify a range of viable alternatives for salt disposal for consideration during development of the Salt and Nutrient Management Plan (SNMP)

- Provide information to help guide discussions regarding:
  - Establishment of regional salt management policies and
  - Need for changes to the existing Basin Plan to facilitate salt disposal in a manner that is most beneficial to the Central Valley

SSALTS Phases

- Phase 1, Characterize Existing Salt Accumulation Study Areas
  - Literature review and identify Representative Study Areas (Task 1.1 - 1.2)
  - **Characterize study areas to establish baseline information (Task 1.3)**
  - **Screening Level Analysis of Long-term sustainability (Task 1.4)**
- Phase 2, Develop Potential Long-term Salt Management Strategies
  - In-Valley alternatives
  - Out-of-Valley alternatives, and
  - Hybrid alternatives
- Phase 3, Evaluate Potential Salt Disposal Implementation Alternatives
  - Develop and apply feasibility criteria (e.g., regulatory, institutional, economic, technological, etc.)
  - Identify and prioritize acceptable salt disposal alternatives for potential incorporation into Central Valley SNMP

SSALTS Study Areas Selected

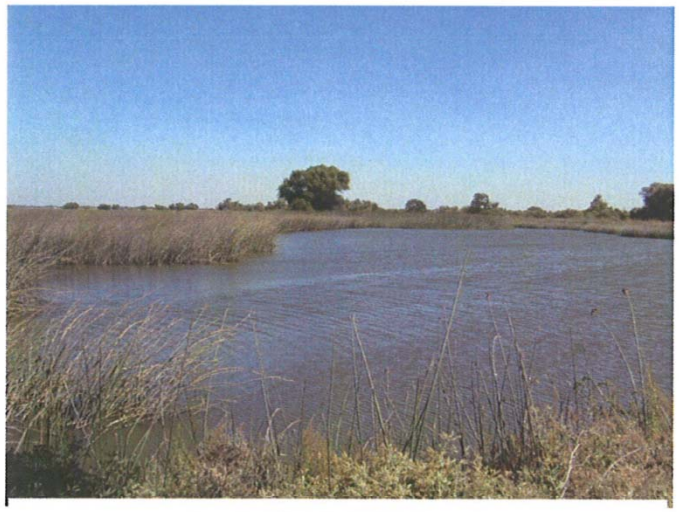
#	Study Area	Central Valley Basin Planning Area	Representative Sector/Area
1	Red Rock Ranch	Tulare Lake Basin	Agriculture
2	City of Dixon	Sacramento River Basin	Municipal
3	Westside Regional Drainage Plan	San Joaquin River Basin	Agriculture
4	San Luis Unit Ocean Disposal	San Joaquin River Basin	Agriculture
5	Hilmar Cheese	San Joaquin River Basin	Industrial
6	Grasslands Water District	San Joaquin River Basin	Agriculture
7	City of Tracy	San Joaquin River Basin	Municipal
*8**	*Stevinson Water District*	*San Joaquin River Basin*	*Agriculture*
*9**	*Tulare Lake Bed*	*Tulare Lake Basin*	*Agriculture*
*10**	*Industrial Food Processing*	*Central Valley*	*Industrial*

Study Area Characterization (Task 1.3)

- Attributes
  - Physical,
  - Land cover,
  - Institutional, economic or regulatory
- Sources of Salt
- Salt Accumulation Capacity
  - Existing approaches for evaluating capacity
  - Additional opportunities to evaluate capacity
- Cost/Benefits
- Institutional/Regulatory Barriers

Stevinson Water District (SWD)

- Collaborative effort to control agricultural drainage
  - SWD, Merquin County Water District (MCWD)
  - DWR, CV-RWQCB, SWRCB
- Integrated Water Resources Plan (2005)
  - Purpose
    - Control shallow groundwater levels
    - Manage agricultural drainage
    - Support water conservation
  - Projects
    - Convert earthen laterals to pipelines
    - Artificial wetlands enlargement and enhancement



An Artificial Wetland in the Stevinson Water District

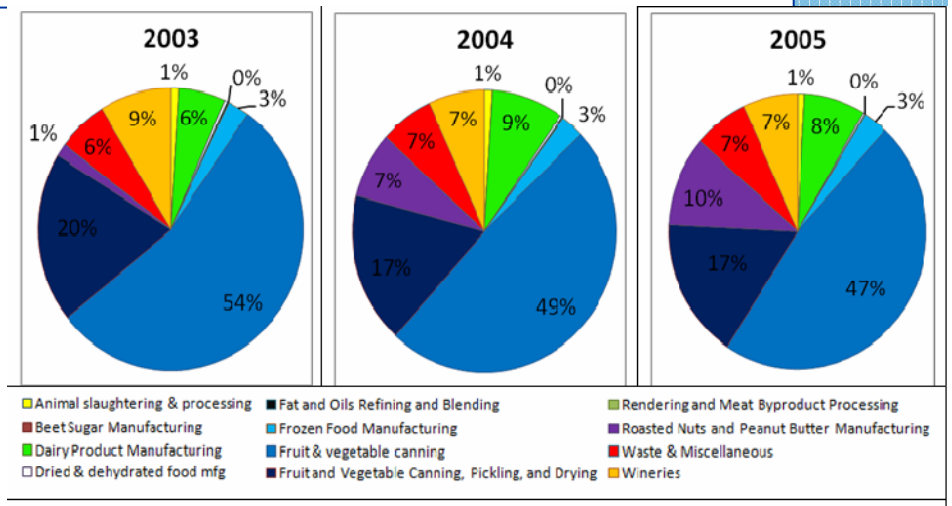
Source: SWD, 2006

Stevinson Water District – Key Issues

- Technical
  - Installation/operation of WQ and flow monitoring stations
  - SCADA control of timing of agricultural drainage discharges
  - Design/construction of infiltration/recirculation wetlands
- Institutional
  - Westside Watershed Coalition,
  - San Joaquin Valley Drainage Authority (SJVDA)
- Regulatory
  - Mitigated Negative Declaration for the IWRP
- Salt Capacity/Sustainability
  - Discharges restricted to winter-time
  - Uses available assimilative capacity in SJR

Industrial Food Processors

- ~640 food processors operating in the Central Valley
  - 119 discharge to POTWs regulated by NPDES permits WDRs
  - 212 discharge to land under individual WDRs;
  - 62 small wineries or food processors discharge to land under general waiver (Order No. R5-2009-0097);
  - 250 discharge to land without a RWD (source CV-RWQCB, 2006)

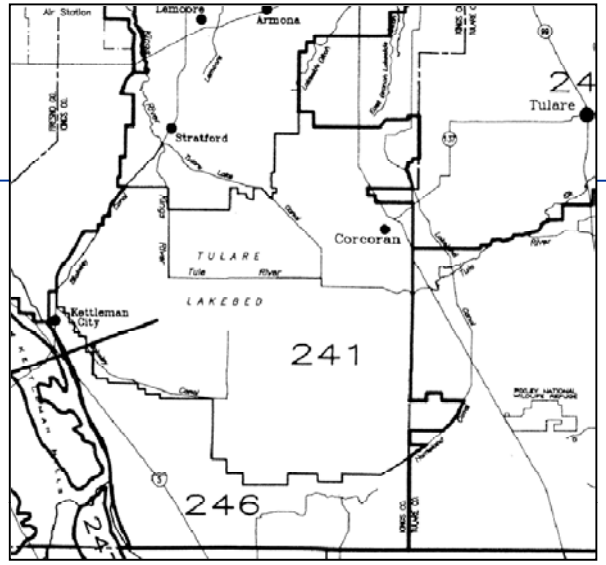


Percent of total FDS loads (metric tons) for the Central Valley by industry (Hilmar Cheese Company SEP 2007)

Industrial Food Processors – Key Issues

- Technical - general salt reduction strategies
  - Supply Water Treatment
  - Boiler Feed Water Treatment
  - Product Loss Reduction
  - Cleaning and Process Chemical Treatment and Reduction
  - Effluent Treatment
- Institutional
  - Manual of Good Practice for Land Application of Food Processing/Rinse Water (prepared for the California League of Food Processors (B&C/KJ 2007)
  - Industrial Comprehensive Guide to Sustainable Management of Winery Water and Associated Energy (developed for the Wine Institute and American Vineyard Foundation (K/J, 2008)
- Regulatory
  - WDRs
  - Antidegradation Policy
- Salt Capacity/Sustainability
  - Ultimate disposal of salt accumulation

Tulare Lake Basin



- Tulare Lake Basin is a closed system, and there is currently no drain outlet.
- High salt concentrations (ranging from 5,000 to 35,000 µS/cm [TLBWSD 2012]) reduce crop yields throughout the Basin and make the groundwater unusable for agriculture or municipal purposes.
- Groundwater sources under the Tulare Lake bed are designated as having MUN and AGR beneficial uses.

Tulare Lake Basin – Key Issues

- Technical
  - Currently subject of a CV-SALTS archetype
  - Considered key to implementation of salt management options
- Institutional
  - Tulare Lake Drainage District
  - Tulare Lake Basin Water Storage District
- Regulatory
  - MUN De-Designation process
  - Irrigated Lands Regulatory Program (ILRP)
    - WDRs
    - Monitoring and Reporting Programs (MRPs)
- Salt Capacity/Sustainability
  - Short-term drainage management
  - Long-term salt accumulation in a closed basin

SSALTS Comments Task 1.3

- Comments received from the CV-RWQCB
  - Westside Regional Drainage Plan:
    - Separate discussions of closed basin and flow-through (Grasslands)
  - Red Rock Ranch:
    - Discuss Limited acceptance of IFDM
    - Describe ultimate disposal of salt accumulation on-farm
  - Discussion of the 1996 Basin Plan Amendment that set up the priorities and framework for the Use Agreement for the Grasslands Bypass Project including:
    - Designating limited beneficial uses;
    - Site specific water quality objectives;
    - Prohibitions of discharge into specific water bodies; and
    - Compliance schedule for others

SSALTS Comments Task 1.3

- Comments received from the CV-RWQCB -continued
  - Clarify the status of each study area (conceptual, operational)
  - Note that existing projects may not comply with current regulatory requirements in the Basin Plan.
- Address key questions:
  - Does the project comply with current Basin Plan requirements and other regulations and will it continue to do so over a 50 year period and ultimately 200 years?
  - What changes to the Basin Plan are needed to allow continued operation of superior salt management approaches?
  - If the local management of salt does not provide a complete solution, what additional steps have to eventually be taken?
  - Where does the salt end up? For example, Red Rock Ranch concentrates salt, but is not designated as a disposal site. Where will the salt go?
  - The impact of the projects on groundwater quality is often not discussed. This is understandable given the available information, but this is a key element in evaluating the feasibility (and sustainability) of these operations.

Task 1.4 Approach – Long term Sustainability Analysis

- Perform a screening-level analysis of the long-term sustainability of representative study areas
  - Future, initially over 50-years
  - Beyond that in 50-year increments (up until 200-years)
- Analysis relies on initial mass balance estimates and expected loadings based on what we know now
  - Working with the ICM team
  - Identify known trends relative to historic, current, and future conditions in the SSALTS study areas.

Task 1.4 Approach – Long term Sustainability Analysis (continued)

- Initial testing of the long-term sustainability analysis
  - Utilize the ICM 20-year output for mass loadings and surface water quality for the specific catchments overlying the SSALTS study areas.
  - Proposed approach:
    - Surface Water - extrapolate the current WARMF model output for the study areas
    - Longitudinal “Gowdy” output provides loading by sources
  - Utilize ICM modeling outputs for GW impacts
    - Identify shallow GW impacts based on ICM 20-year simulations
    - Long-term - Use representative hydraulic conductivity, porosity, and vertical gradients for study areas

SSALTS Next Steps

- Draft Task 1.3 Study Area Characterization TM
  - TAC comments – submit to Roger Reynolds
  - Complete remaining studies area characterization
- Draft Task 1.4 Screening Level Analysis of Long-term Sustainability TM
  - Will build on Task 1.3 TM
  - Submittal for May TAC review
- Draft Phase 1 Report
  - Will build on Task 1.3 and 1.4 TM
  - Submittal for June TAC review
  - All comments will be incorporated into Draft Phase 1 report