CV-SALTS Annual Report

CV SALTS
Central Valley Salinity Alternatives for Long-term Sustainability

Presentation Outline

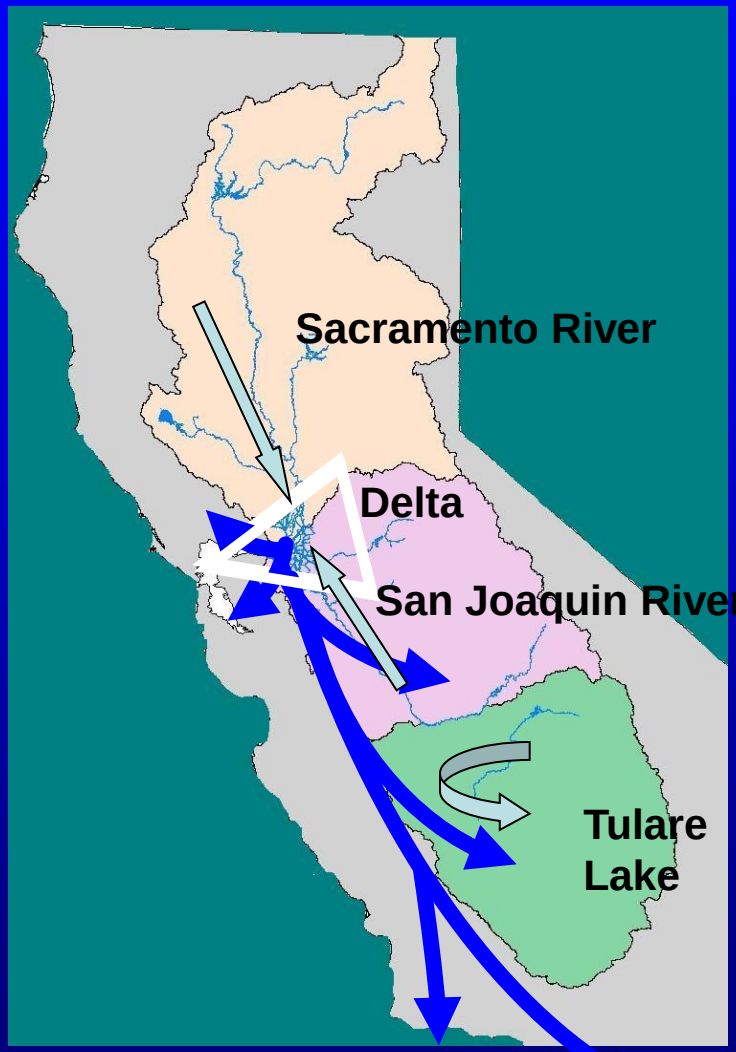
- Background
- Resolution Reporting Requirements
- Implementation Strategy
  - Addressing Nitrate Drinking Water Issues
  - Sustainable Salt Management
- Moving Forward

CV SALTS

Central Valley Salinity Alternatives for Long-term Sustainability

- Collaborative Basin Planning Effort
- Utilizing Stakeholder Process to Develop Salinity and Nitrate Management Plan

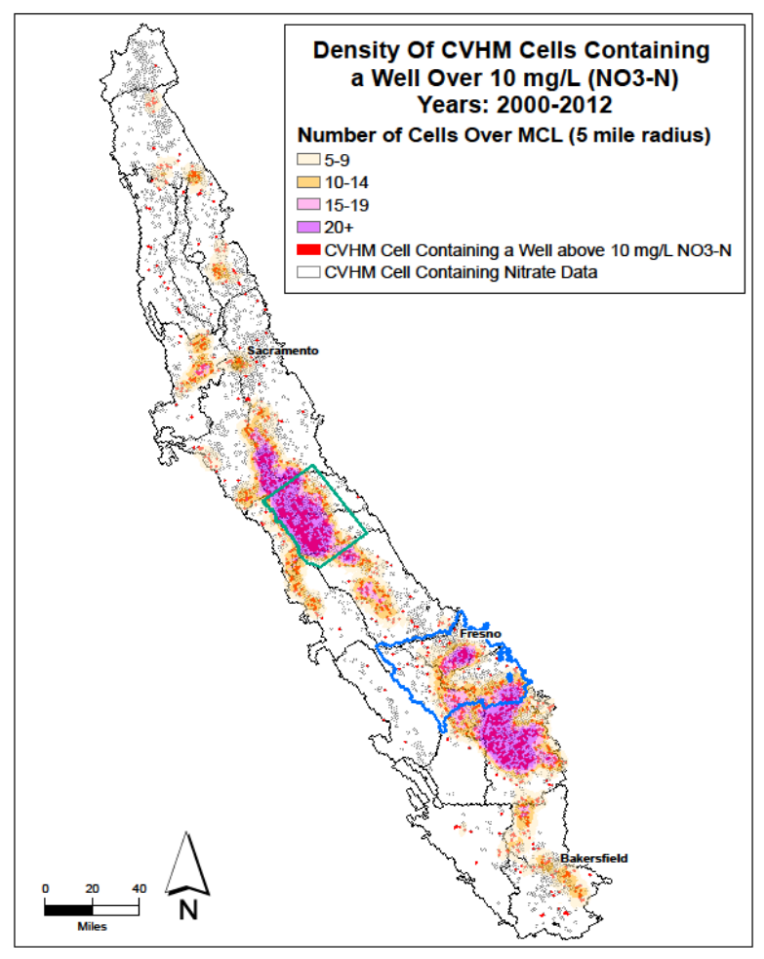
Central Valley Salt Issues



More salt enters the region than leaves

- Impacts (current/legacy)
  - Agricultural Production
  - Drinking Water Supplies
- Economic Cost
  - Direct Annual: $1.5 Billion
  - Statewide annual income impact: $3.0 Billion
- Diverse Sources

Central Valley Nitrate Issues



- Legacy Conditions
- Direct Impacts
  - Drinking Water Supplies
- Economic Costs
  - Treatment
  - Alternate Supply
- Diverse Sources

CV-SALTS Goals

Safe Drinking Water in Areas with Nitrate Impacted Groundwater

Environmental and Economic Sustainability

Cleanup and Abatement (CAA) Funds $5-million Seed Money

- $1.2-million (Res. #2009-0023)
- $3.8-million (Res. #2010-0042)

Res. #2010-0042 Requirements

- Annual Report at Public Hearing
  - Expenditures to Date
  - Services Provided
  - Contribution from Stakeholders
  - Accomplishments
  - Timeline to Complete Work

CVSC 27 Member Benefit Non-Profit

- County of San Joaquin
- City of Stockton
- Stockton East Water District
- The Wine Institute
- City of Tracy
- California Rice Commission
- City of Manteca
- City of Modesto
- San Joaquin River Group
- City of Vacaville
- City of Fresno
- City of Davis
- Westlands Water District
- California Resources Corporation
- California Association of Sanitation
- Central Valley Clean Water Association
- California League of Food Processors
- Tulare Lake Drainage District/ Tulare Lake Basin Water Storage District
- San Joaquin Valley Drainage Authority
- Sacramento Regional County Sanitation
- Western Plant Health Association
- East San Joaquin Water Quality Coalition
- California Cotton Growers and Ginners
- Southern San Joaquin Valley Water Quality Coalition
- Dairy CARES/Western United Dairymen
- Pacific Water Quality Association
- Los Angeles County San District

Expenditures for Services and Stakeholder Contributions

	Since July 2008
CAA Resolution #2009-0023	$1,113,024
CAA Resolution #2010-0042	$1,788,850
Central Valley Salinity Coalition (CVSC) expenditures and direct match through September 2014*	$1,593,145
Additional Stakeholder Contributions --Treatment/Feasibility studies; basin planning support; water quality data	$12,875,291
Total:	**$17,363,120***

*Does not include in-kind service participating on committee(s)

Services Provided/Accomplishments

Data Compilation and Modeling

- ✓ Conceptual Model
- ✓ GIS Beneficial Use/ AGR Zone Efforts

Beneficial Use

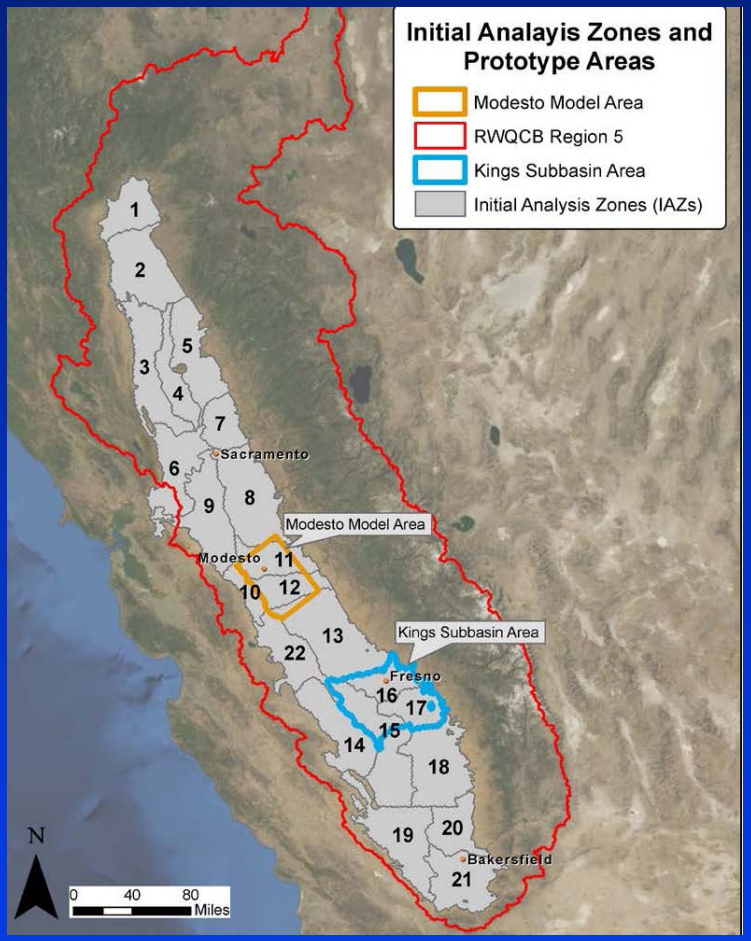
- ➢ Tulare Lake Groundwater
- ➢ MUN in Ag Dominated Water bodies

Water Quality Objectives

- ✓ Aquatic Life
- ✓ Stock Watering
- ✓ Salt Effects on Irrigated Ag
- ✓ Salt Effects on MUN
- ➢ Lower San Joaquin River

Implementation

- ➢ SSALTS (Accumulation/Transport)
- ➢ Alternate Compliance Strategy (Legacy Nitrate)



Services in Progress

CAA Co-Funded Projects

- Administrative, Technical & Facilitation Support
- Phase II Conceptual Model
- SSALTS Phase 3
- Case studies to ground truth policy and implementation options
  - MUN Surface Water
  - MUN/AGR Groundwater
  - Lower San Joaquin River (Objectives/Implementation)
  - Early Implementation (safe drinking water)

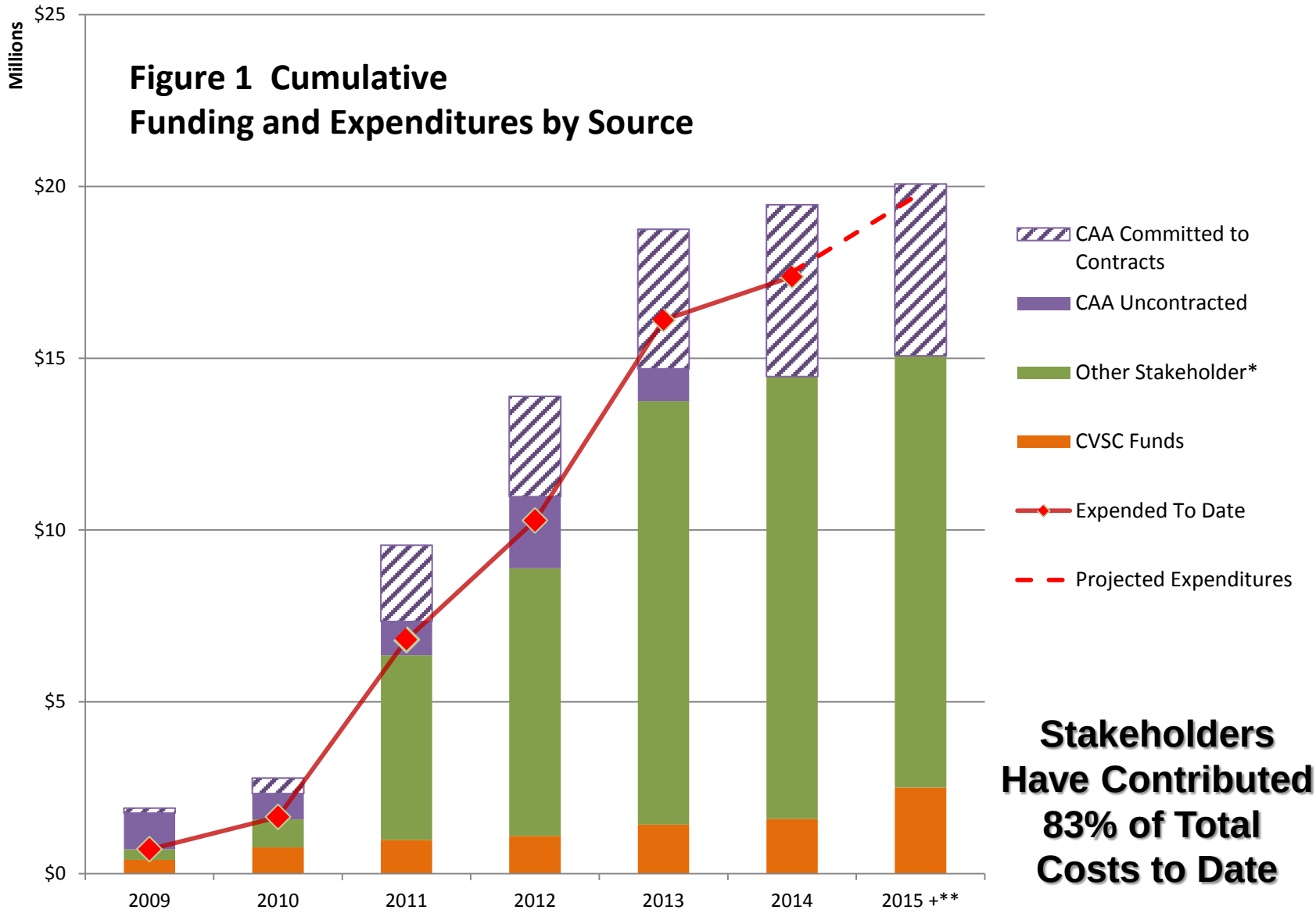


Figure 1 Cumulative Funding and Expenditures by Source

Stakeholders Have Contributed 83% of Total Costs to Date

Summarized CV-SALTS Workplan Schedule

Figure 2 - Summarized CV-SALTS Workplan Schedule

Revised 1/1/15

Draft SNMP To Regional Board → *Final SNMP →* *BPA →*

CV-SALTS Program Element	2011	2012	2013	2014	2015	2016	2017	2018	+
Program Management									
Technical Studies									
Archetypes/Case Studies									
Groundwater MUN (Tulare)									
Surface Water MUN (Sac Valley POTWs)									
Management Practice Development									
Lower San Joaquin River Salt and Boron Objectives									
Implementation Planning									
Documentation for Approval									
CEQA Equivalent Documentation									
BPA Documentation Process Support									
Initial Implementation									
Monitoring and Reporting									
Phase II SNMP									

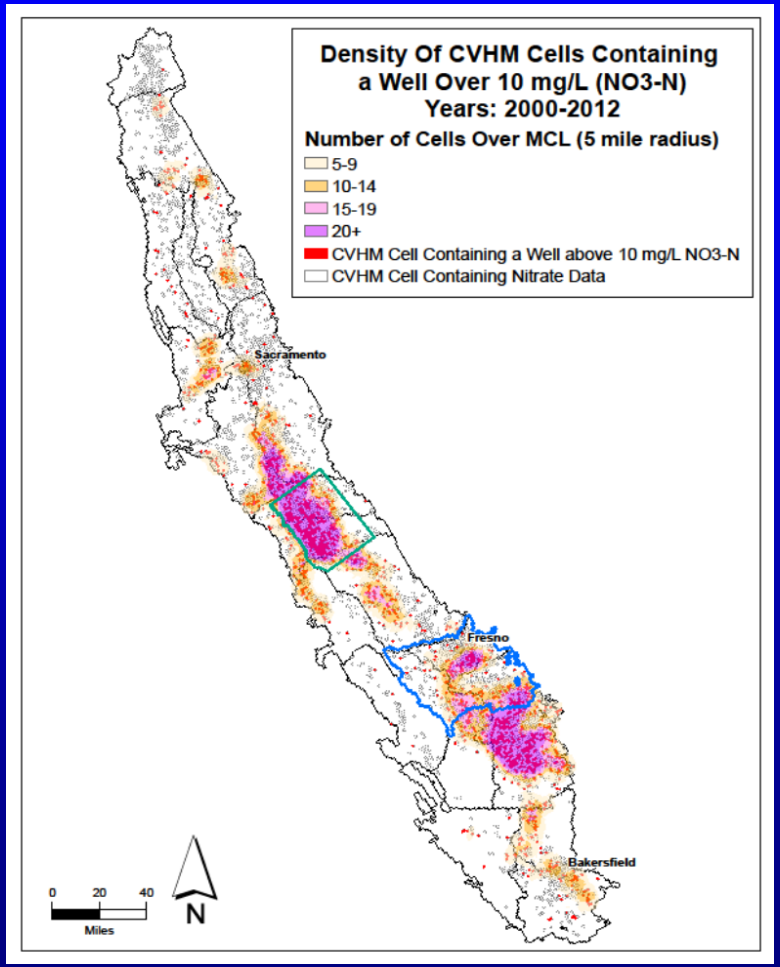
Technical Area	Primary Activities	SNMP Support	2012	2013	2014	2015	2016 (May) Final SNMP
Conceptual Model Development	Initial Conceptual Model	• Source identification • Assimilative capacity • Loading estimates					
	Phase 2	• Preliminary SNMP (technical elements) • Background WQ/ assimilative capacity calculation methods • Management zone study					
	Phase 3	• Antidegradation analysis • Monitoring/Surveillance plan • Economics analysis					
Data Development	GIS – Phase 2	• Baseline database					
	Agriculture Zone Mapping	• AGR implementation tools					
Beneficial Use Studies	Tulare Lake Bed MUN Archetype	• MUN implementation tools					
	MUN Beneficial Use in Agriculturally Dominated Water Bodies Archetype	• MUN implementation tools					
Water Quality Objectives	Salinity-related Effects on Agricultural Irrigation Uses	• Evaluation of science behind establishment of salinity related objectives					
	Salinity Effects on MUN-related Uses of Water						
	Stock Watering Study						
	Aquatic Life Study						
Implementation Planning	Strategic Salt Accumulation Land and Transport Study (SSALTS)	• SNMP implementation measures to manage salt and nitrate on a sustainable basis					
	Salt/Nitrate Management Alternatives Assessment						
Lower San Joaquin River Committee	Technical Analyses (salt loading characterization, modeling)	• Coordination with CV-SALTS SNMP development activities to ensure consistency					
	Basin Planning Activities (WQOs, SED, economics, monitoring, implementation)						

Implementation Strategy

- Addressing Nitrate Drinking Water Issues
- Sustainable Salt Management

Addressing Nitrate in Drinking Water

- Addressing legacy nitrate will take years (i.e., decades)
- Beneficial use protection needs to occur much sooner
- Current regulatory scheme could result in prohibited discharges without addressing drinking water



Key State Board Orders that control WDRs

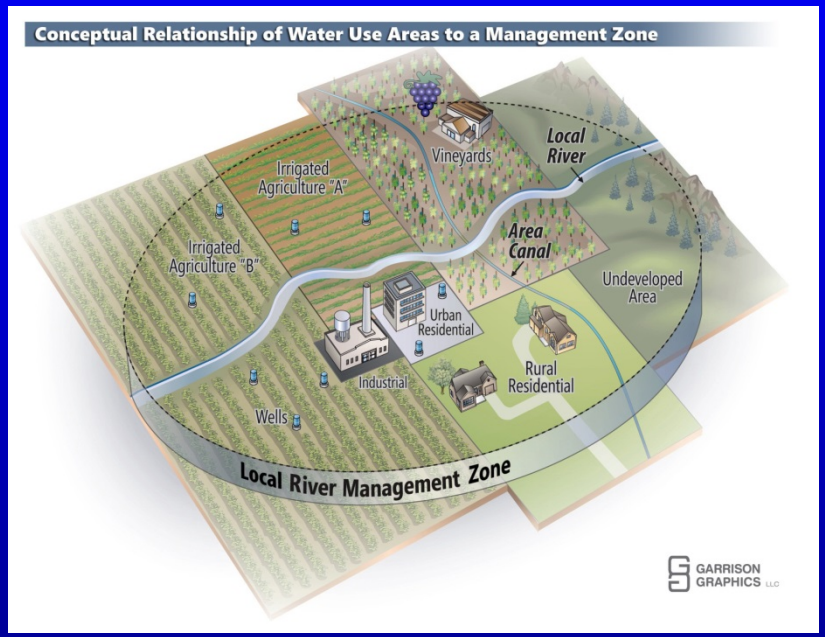
- Order No. 73-4 – Rancho Caballero
  - (*WDRs must implement Basin Plan*)
- Order No. 81-5 – City of Lompoc
  - (*Sets principles for establishing limits depending on if constituent is in receiving water above or below the water quality objective*)
- Order No. 88-12 – San Diego Co. Milk Producers
  - (*May need to prohibit the discharge*)

Order No. 88-12 – San Diego Co. Milk Producers

- Water exceeds objectives, thus limits are required
- Limits could be applied beneath root zone of irrigated field or at point of discharge
- But, in this case, dairy unable to meet potential limits
- Unless new data and information is provided showing assimilative capacity, discharges should be prohibited

Need Alternative Compliance Strategy

- Would give Regional Board *authority* to permit discharges that cannot meet objective
- Prioritize:
  1. Safe Drinking Water
  2. Reduce Impacts
  3. Managed Restoration



At Regional Water Board Discretion

Benefits of Alternative Compliance Strategy

- Addresses nitrate drinking water issues sooner – becomes an enforceable provision in WDR
- Prohibiting discharges provides no benefit and harms the Central Valley's economy
- Allows for implementation of long-term compliance strategies

Example of Alternative Compliance Strategy

Offset

- Allowing discharge, along with proposed offset program (e.g., well-head treatment, point of use treatment, connection to surface water supply), will result in better water quality or user protection than if discharge prohibited

Assimilative Capacity

- Must show maximum benefit to people of the state, cannot unreasonably impact beneficial uses

Timeline for Alternative Compliance Strategies

2015 - Complete outline of policy principles

Early 2016 – Complete SNMP

2017 – Basin Plan Amendment

2018 – Revise WDRs to include Alternative Compliance Strategies

2019 – Begin implementation

Ongoing Nitrate Actions in Existing Ag WDRs

Groundwater Assessment Reports

- Two approved, others in progress

Farm Evaluation Reports

- Most sent to growers, currently being returned and compiled

Nitrogen Management Plan

- Template approved, to growers now

Grower Outreach & Education

- Extensive efforts this winter

SSALTS – Identify Sustainable Salt Management Alternatives

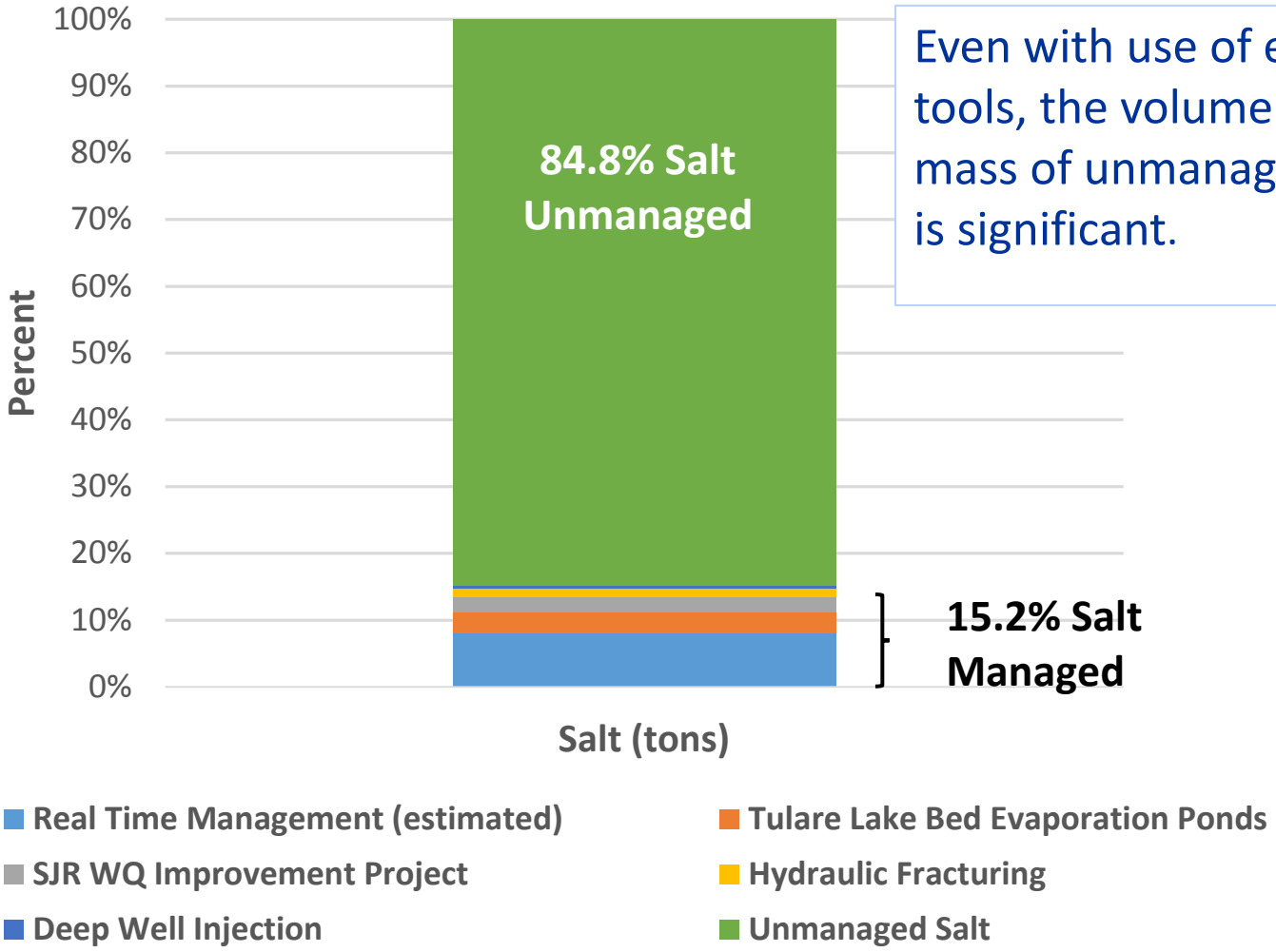
- SSALTS investigating:
  - Magnitude of the problem
  - Requirements to achieve sustainability
  - Available salt management tools - now vs. future
  - Implementation measures for inclusion in the SNMP

Key Salt Management Alternatives

Treatment & Salt Recovery Technology	Brine Disposal and Storage

• Mature Technologies
  • Reverse Osmosis
  • Ion Exchange
  • Lime Softening
  • Evaporation Ponds
• Emerging Technologies
  • Smart Integrated Membrane System (SIMS)
  • WaterFX Aqua4 System – Multi-effect Distillation
  • Zero Discharge Distillation by Veolia – Electrodialysis Metathesis
  • New Sky Energy – Temperature Control and Electrodialysis
  • Element Renewal – addition of polymers to remove trace elements
	• Brine Supply for Hydraulic Fracturing
	• Deep Well Injection
	• Salt Management Disposal Areas
	  • Landfills
	  • Dedicated Disposal Sites
	  • San Joaquin River Improvement Project
	• San Joaquin River Real Time Management
	• Transport Brine Out of Valley
	  • Truck/Rail Brine
	  • Regulated Brine Line
	  • Bay Area WWTP
	  • New, permitted Bay Area Outfall

Achieving Salt Sustainability – Example Scenario from Southern Part of Central Valley

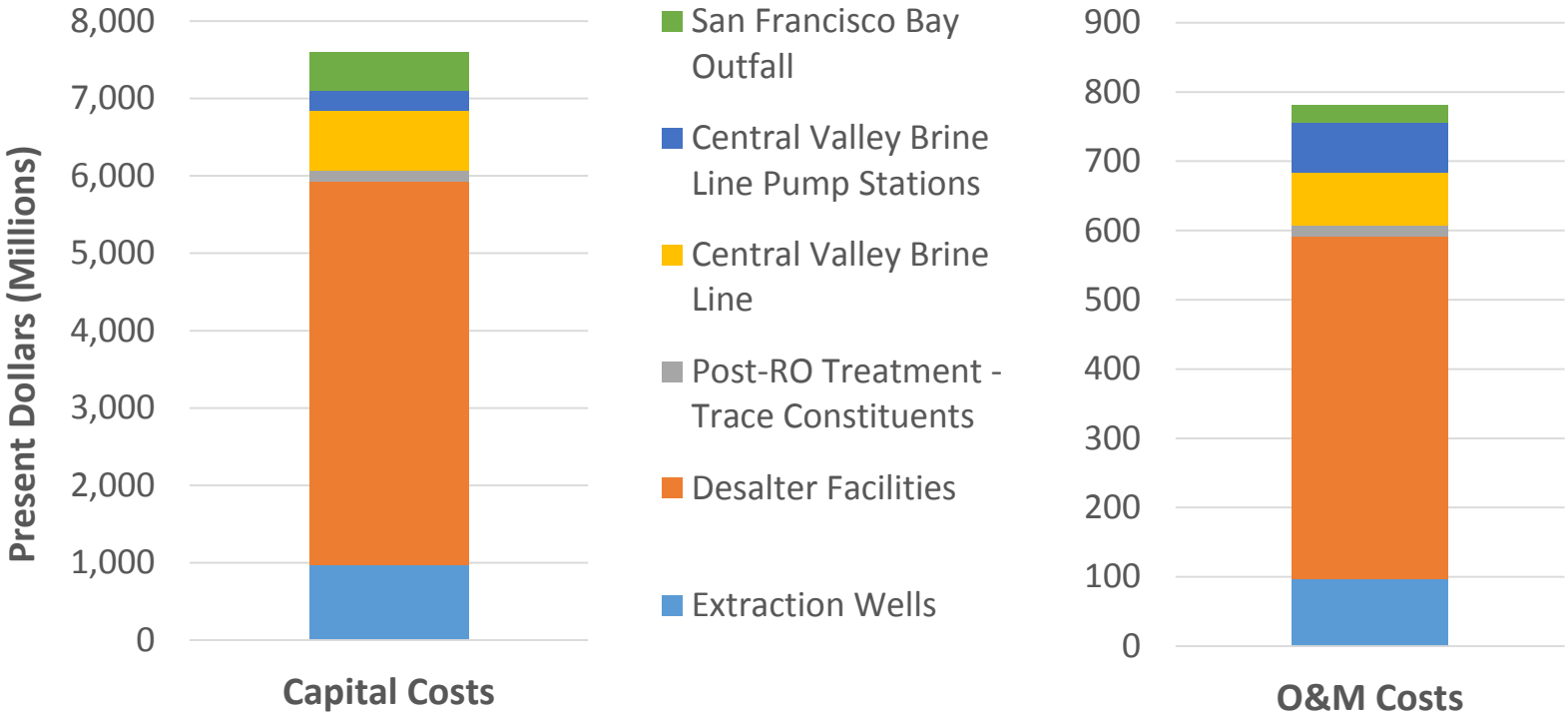


Even with use of existing tools, the volume and mass of unmanaged salt is significant.

Achieving Sustainability Requires Having the Means to Move Salt Out of the Central Valley

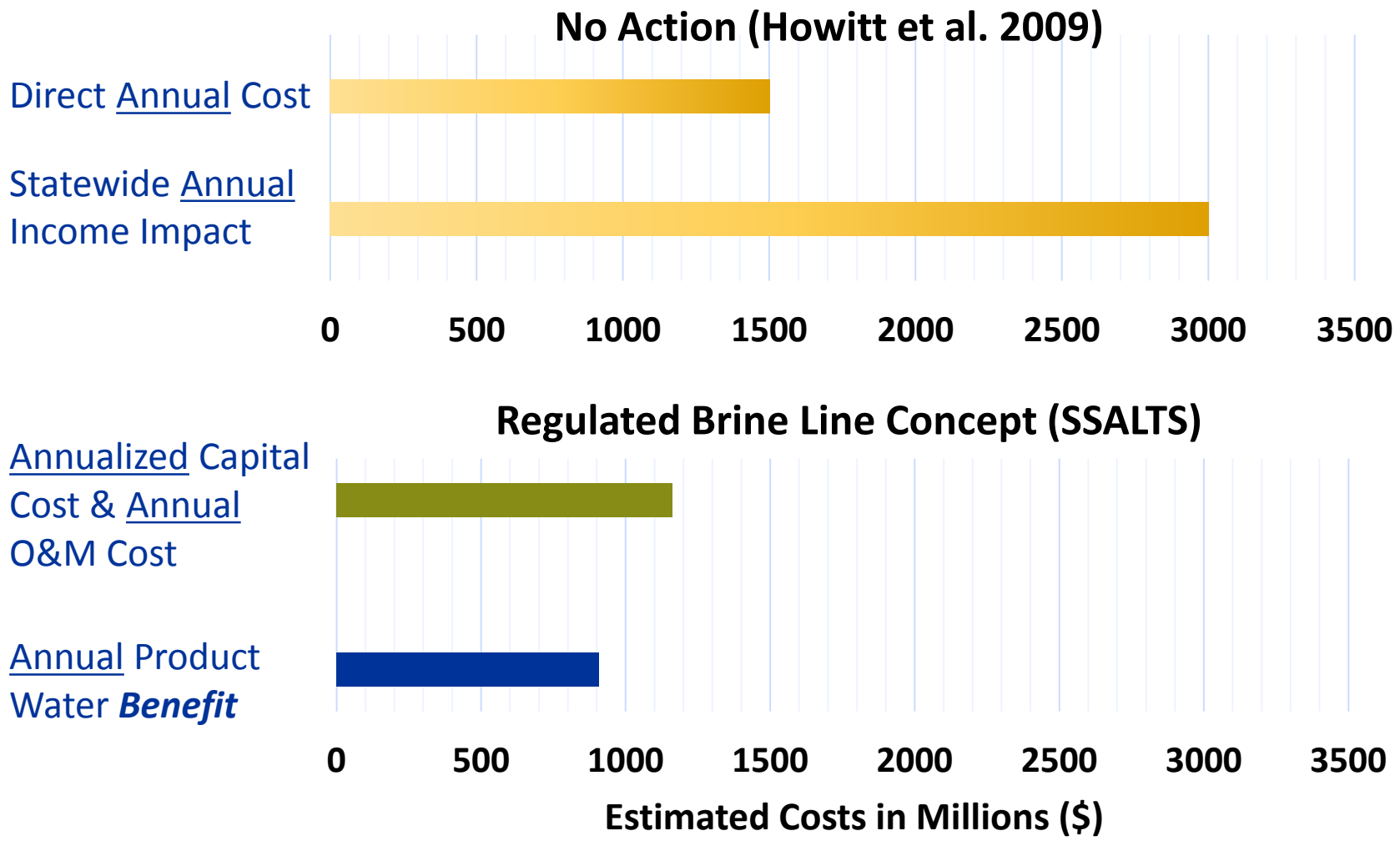
- Central to all evaluated salt management alternatives is a ***regulated Central Valley brine line***
- Concept level analysis completed
  - Alternative Central Valley routes
  - Preliminary Brine Discharge Alternatives
    - Via existing East Bay Municipal Utility District outfall
    - Via an alternative outfall to San Francisco Bay
  - Concept-level cost estimate – Capital and O&M

Conceptual Level Costs for Regulated Brine Line Alternative – Outfall to San Francisco Bay



- Implementation of this alternative would yield product water with an estimated value of $909M/year

Regulated Brine Line Concept vs. No Action



Moving Forward

- Continued Plan Development
- Extensive Outreach

Outreach Target Audiences

- Federal, State & Local Policy Makers
- Agricultural Interest
- POTWs & Stormwater Agencies
- Industrial / Manufacturing Interest
- Environmental Justice Interest
- Environmental Advocacy Interest
- Water Supply and Delivery Interest

Moving Forward

- Continued Plan Development
- Extensive Outreach
- Short/Long-term Funding

Short/Long-Term Funding

- Local Partnerships
- State
- Federal

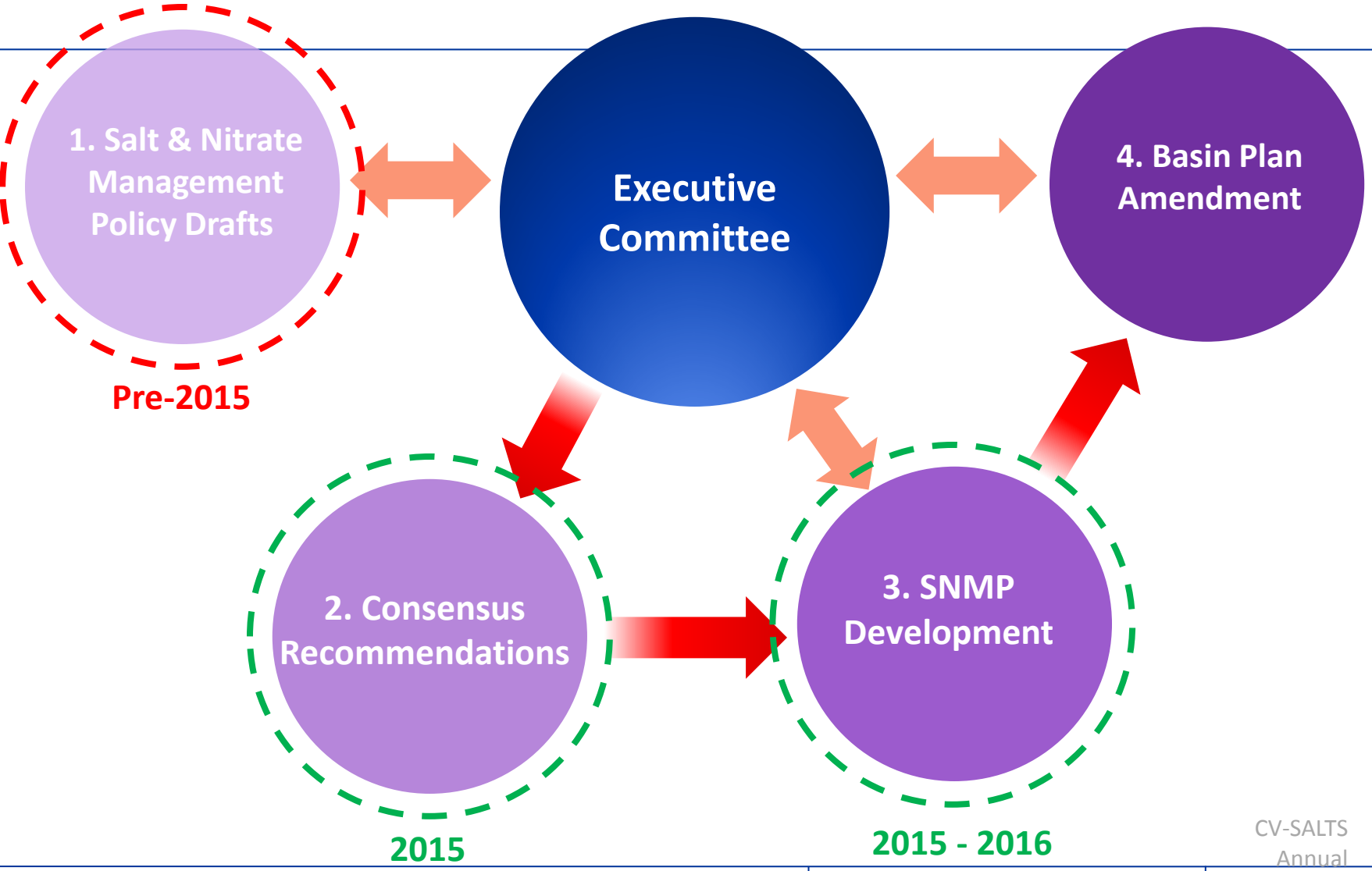
Anticipated Outcomes

- Compliance with Recycled Water Policy
- Updated Central Valley Basin Plans
- Implemented Strategies that:
  - Address Nitrate Drinking Water Issues
  - Achieve Salt Sustainability

Questions?

Extra Slides

Policy Discussion Process

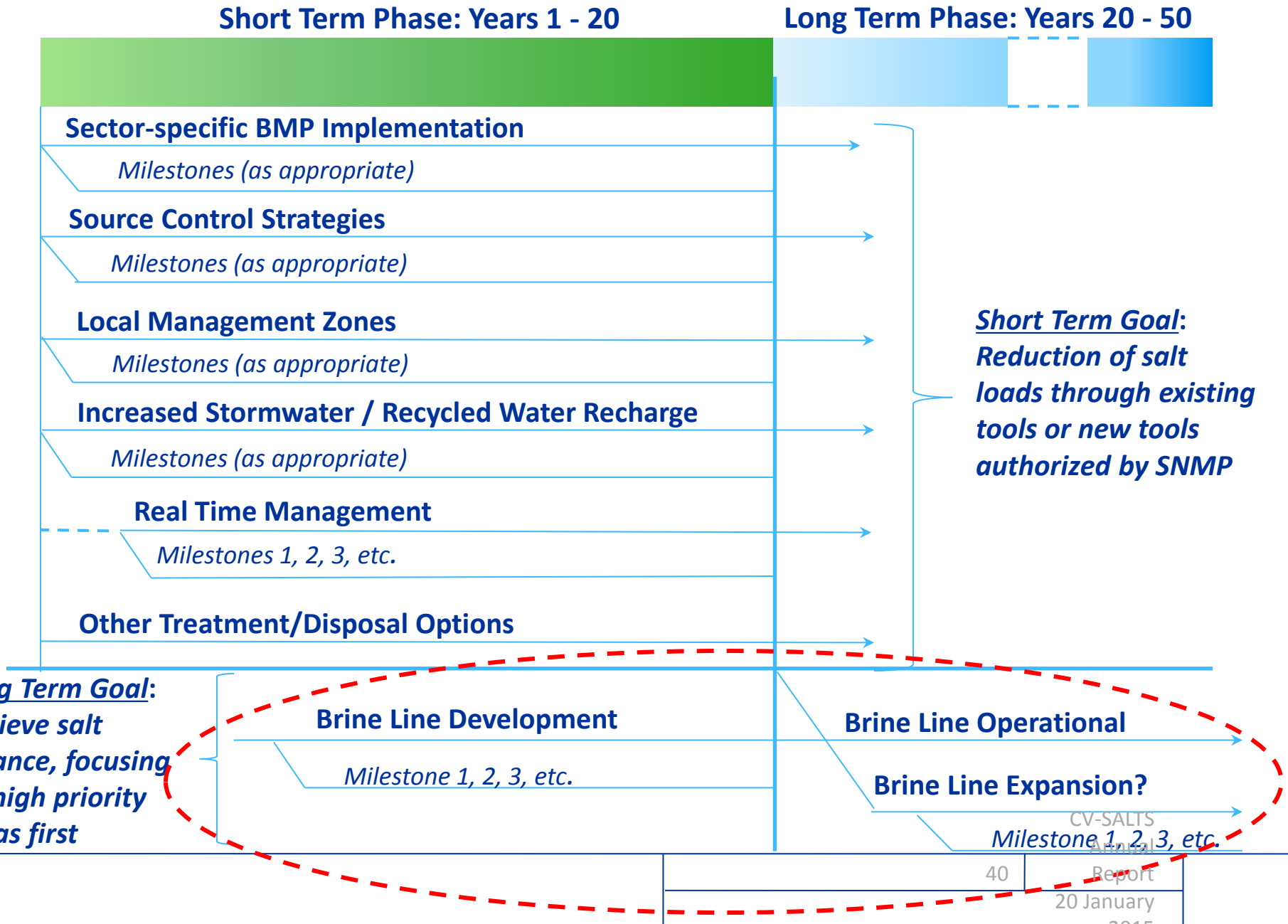


Policy Discussion Topics - 2015

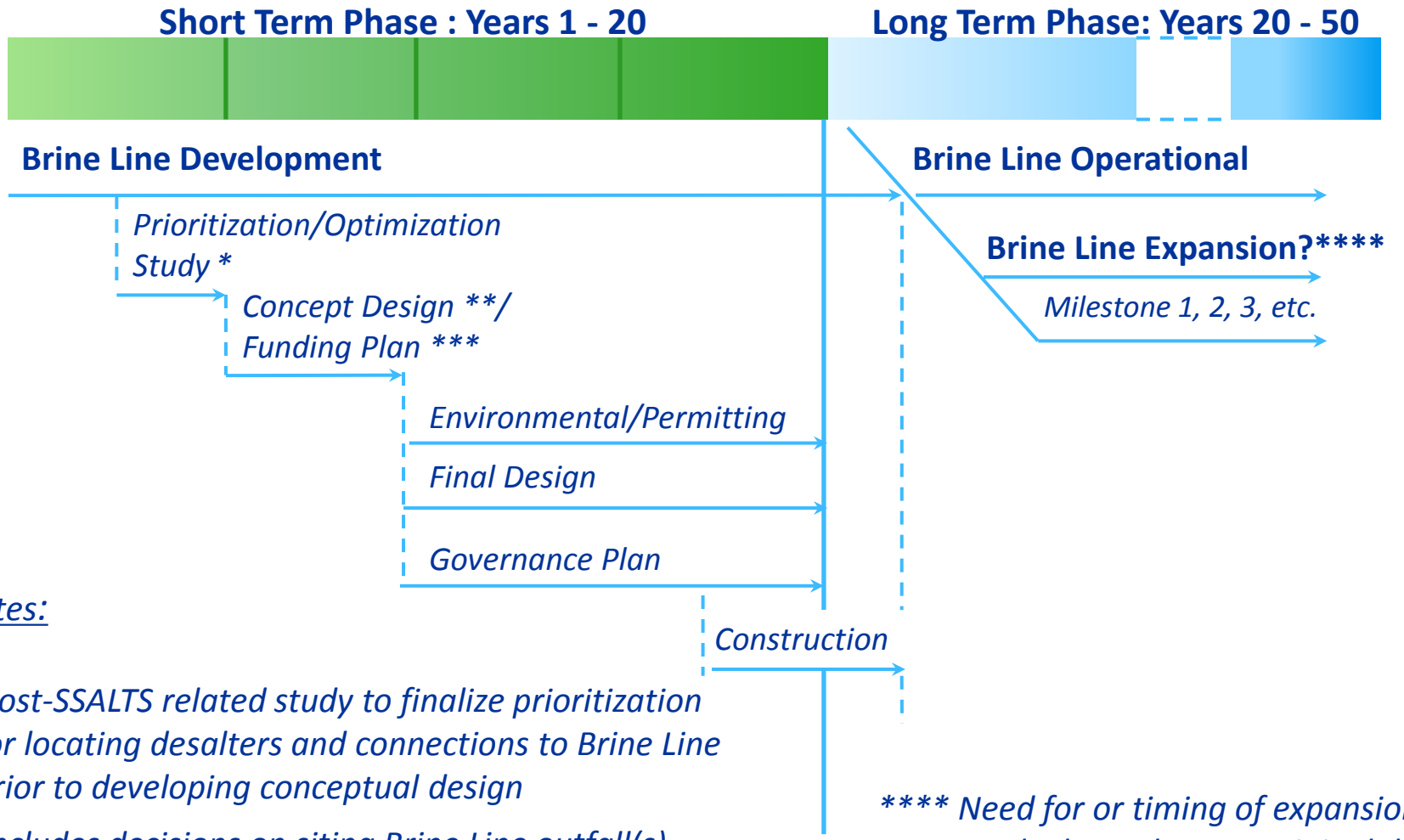
Near Final	Ongoing

• AGR – Agricultural Irrigation
  • "Limited AGR" use for high salinity groundwaters
  • Narrative objective translation procedure
• Application of Secondary MCLs to MUN
• Principles for calculating background water quality and assimilative capacity
• Alternative compliance strategies, e.g. alternate water supplies, offsets, etc.
• Benefits and limitations of existing regulations/policies that determine salt and nitrate management
• Evaluating BPTC, BMPs, and "best efforts"
• Maximum benefit guidance
	• Water Quality Objectives
	  • Consideration a "Limited-MUN" Use
	  • Narrative objective for "General Constituents"
	  • Salinity objectives for livestock watering
	• Further delineation of surface water bodies and/or groundwater basins
	• Methods to characterize trends in assimilative capacity and assess effect of discharge on available assimilative capacity
	• Pollutant trading, offset programs and long-term compliance schedules in groundwaters
	• Integrate SNMP with other state policies, e.g., conservation, stormwater harvesting, recycled water reuse, groundwater recharge, drought management

Salt Management - Conceptual Phased Implementation



Conceptual Phased Implementation of Brine Line with Example Milestones



Notes:

** Post-SSALTS related study to finalize prioritization for locating desalters and connections to Brine Line prior to developing conceptual design*

*** Includes decisions on siting Brine Line outfall(s)*

**** Funding Plan explicitly confirms the existence of federal, state, local and permittee funding)*

***** Need for or timing of expansion greatly dependent on original design*