CV-SALTS Public Education & Outreach Committee Meeting

When: Wednesday, January 31, 2018 from 11:00 AM to 12:00 PM
Location: Teleconference Only
Conference #: (641) 715-3580   Code: 279295#

Agenda

1. Welcome and Introductions

2. Approval of Minutes from the October 10th meeting

3. Recap and Follow-up from January 19th Regional Board Workshop - Daniel
   - Suggestions, revisions comments towards the March 12th Hearing

4. Discuss EJ PowerPoint and any final Comments – Charles
   - Groundwater Quality Risks and Solutions – Public
   - Groundwater Quality Risks and Solutions – Technical

5. Outreach Matrix Update – Mary and Charles
   - Review Documented Activities and Feedback
   - Updates and needs
     - Draft Communications Strategy for 2018
     - Snapshot of Audiences Reached in 2017

6. Discuss material/product needed
   a. Industry/Community inserts – Charles/Mary
      - Final Approved Drafts
        - Oil & Gas
        - Sacramento Valley Agriculture
        - POTWs
      - Status
        - Drinking Water

7. Recap Next Steps and Set Next Meeting

8. Adjourn

One or more Central Valley Regional Water Quality Control Board members may attend.
CV-SALTS Public Education and Outreach Committee Meeting ACTION NOTES

Convened: October 10, 2017 from 3:30 PM to 4:30 PM  
Participants: Nicole Bell (Chair), Charles Gardiner, Glenn Meeks, Cristel Tufenkjian, J.P. Cativiela, Parry Klassen, Mary Currie, Bruce Houdesheldt, Walt Plachta, Tim Lovley

Agenda

Item 1: Welcome & Introductions
- Participants are as indicated above.

Item 2: Approval of Minutes of the September 12th Meeting
- J.P. Cativiela moved, and Cristel Tufenkjian seconded, and by general acclamation the September 12th meeting notes were approved.

Item 3: Outreach Matrix Update
- The committee discussed the outreach tracking format. The document has been converted to a Google doc. Charles will send forward the link to PEOC members for testing. Committee members were asked to begin populating the matrix with upcoming events that would be appropriate outreach venues.
- J.P. Cativiela shared the PowerPoint presentation he used at the 2017 Groundwater Resources Association Law Workshop.

Item 4: Discuss material/product needed.
- Glenn Meeks moved, and Parry Klassen seconded, and the committee voted to approve the Final Approved Draft of the San Joaquin Valley and Delta Agriculture insert.
- The committee discussed the status of the other inserts:
  - Dairy - J.P. will confirm with Pamela Creedon that the edits have been made per the instructions received at the August Executive Committee meeting.
  - Sacramento Valley Ag – Bruce Houdesheldt wanted more time to review and discuss with Tim Johnson before finalizing for distribution. Mary will revise the insert based on committee discussion and distribute to PEOC ILRP members for review.
- The following inserts will be finalized and presented for approval at the next Executive Committee meeting:
  - POTWs, Oil and Gas, and Sacramento Valley Agriculture.
- The Drinking Water insert is still in draft stage.
- The committee agreed final outreach documents should be locked for editing prior to public distribution.
- After minor edits are complete on the Outreach Brochure and Fact Sheet, the final versions will be sent back to the translator.

Item 5: Recap Next Steps and Set Next Meeting
- A Meet-O-Matic will be sent out to determine the best date for the next PEOC meeting.

Item 6: Adjourn
GROUNDWATER QUALITY – RISKS AND SOLUTIONS

COMMUNITY WATER CENTER
EL CENTRO COMUNITARIO POR EL AGUA

www.communitywatercenter.org
PURPOSE OF THIS TALK

• Understand groundwater quality issues in the Central Valley and how they can be solved
  • Nitrate and salinity contamination
  • Possible future groundwater quality conditions
  • Projects and funding improve groundwater quality
Catalyst for community-driven water solutions through organizing, education, and advocacy

Programs include:

- Sustainable Groundwater
- Safe and Affordable Drinking Water Solutions
- Community Power and Engaged Leadership
GROUNDWATER CONTAMINATION

- Contamination in groundwater can make it unsafe to drink and can harm crops.
- CV-SALTS is focused on reducing salt and nitrate contamination. Nitrates come primarily from application of fertilizers on farms and from cattle and dairy operations. Salts in water from the Delta adds to local salinity sources.

Video available at: https://www.youtube.com/watch?v=f1ArRV9HmtI
Directed and Edited: Kristine Diekman, Video in the Community; Animation: Jermaine Jackson
WHAT IS CV-SALTS?

- Central Valley Salinity Alternatives for Long-Term Sustainability or CV-SALTS
- Representatives of agriculture, cities, industry, and State agencies meeting since 2006 to address nitrate and salinity problems
- High levels of nitrates in groundwater can result in serious health concerns for people who drink the water and
- High levels of salinity can pollute the soil so that it can no longer grow crops

Figure adapted from: Nitrate Implementation Measures Study (NIMS) Final Report, 31 March 2016, CDM Smith.
CV-SALTS PROCESS

• Developed a Salt and Nitrate Management Plan (SNMP) for the Central Valley with the following goals:
  1. Ensure a Safe Drinking Water Supply

Where reasonable, feasible, and practicable:
  2. Take measures so salt and nitrate problems do not get worse
  3. Clean up salt and nitrates from groundwater basins

• The Central Valley Water Board is working with CV-SALTS stakeholders on amendments to the Central Valley Basin Plan, which will create additional requirements to control and reduce salinity and nitrates in the Valley

• Implementation strategies such as the formation of management zones, provision of replacement water, funding for projects and pathway to regulatory compliance for dischargers are expected
MOVEMENT OF GROUNDWATER

• Is complex and is not the same throughout the basin

• Groundwater movement is influenced by:
  • Irrigating more than the plant can use
  • Leakage from bottom of creeks
  • Groundwater pumping
  • Underground soil conditions
  • Weather – rainfall and temperature
  • Underground flow from neighboring areas

Movement of groundwater can concentrate, dilute, or move contaminants, such as nitrates
• Pumping of groundwater causes groundwater to move
• Pumping causes groundwater levels to lower
• This can result in:
  • Shallow wells going dry
  • Movement of contamination

Figure adapted from: Union of Concerned Scientists, 2017. Getting Involved in Groundwater: http://www.ucsusa.org/cagroundwatertoolkit
BASIN OVERDRAFT

• Overdraft - more water is taken out of a groundwater basin than is able to be recharged

• Risks from multi-year overdraft:
  • Land subsidence, or sinking of the ground surface, can occur
  • The geology in the aquifer is compressed, and water storage capacity can be lost permanently
  • Shallow wells go dry and deeper wells must pump from lower groundwater levels

Figure adapted from: Union of Concerned Scientists, 2017. Getting Involved in Groundwater: http://www.ucsusa.org/cagroundwatertoolkit
Groundwater computer models are used to predict groundwater levels, groundwater quality, and movement of groundwater.

The models use information such as:
- Stream flow measurements,
- Rainfall records,
- Groundwater pumping records,
- Soil and geological characteristics, and more.

Better data – more confidence you can have in the model.

Available data is always limited, and assumptions must be made.

MODEL CALIBRATION

• The information from the models must be checked against real measurements to make sure the model is as accurate as possible – this is called calibration.

• The more data available, the better calibrated a model can be – but no model is perfectly calibrated, especially when trying to predict many years into the future.

• Although not perfectly accurate, models can be useful tools to inform decision-making.
Located in Tulare, Fresno, and Kings Counties and the Kings Groundwater Subbasin

Detailed modeling studies have been conducted for this area as a part of the CV-SALTS work

Goal was to see if detailed studies in an area like AID can lead to projects and programs that meet the CV-SALTS goals and can be used Valley-wide
While most domestic community water systems provide safe drinking water, nitrates and TDS (salts) exist throughout the area at concentrations which threaten public health.

- Nitrate concentrations in all zones of the aquifer exceed the drinking water standard of 10 mg/L.
- TDS concentrations in upper zone (where most drinking water wells exist) exceed 500 mg/L → safe to drink but may have taste problems.

Concentrations are higher in shallow groundwater because impacts are migrating downward from the surface.

MCL: Maximum Contaminant Level, regulatory drinking water standard

Figure adapted from: CV-SALTS Management Zone Archetype Analysis: Alta Irrigation District, May 2016.
**FUTURE TRENDS - PRODUCTION ZONE**

*Baseline scenario, no mitigation or other interventions implemented. MCL: Maximum Contaminant Level, regulatory drinking water standard; Figures adapted from: CV-SALTS Management Zone Archetype Analysis: Alta Irrigation District, May 2016.*

**Current Nitrate**
- >10 mg/L
- 7.6 - 10 mg/L
- 5.1 - 7.5 mg/L
- 2.6 - 5 mg/L
- <2.5 mg/L

**Projected Nitrate in 50 years***
- >25 mg/L
- 10 - 25 mg/L
- 7.5 - 10 mg/L
- 5 - 7.5 mg/L
- 3.5 - 5 mg/L

**Current TDS**
- >1,000 mg/L
- 751 - 1,000 mg/L
- 501 - 750 mg/L
- 251 - 500 mg/L
- <2.5 mg/L

**Projected TDS in 50 years***
- >1,000 mg/L
- 751 - 1,000 mg/L
- 501 - 750 mg/L
- 251 - 500 mg/L
- <2.5 mg/L

*Most areas exceed the MCL*

*Many areas more than double the MCL*
NITRATE REDUCTION STRATEGIES

• Source control measures
  • Reduce use of fertilizers
  • Improve management of crops
  • Be more efficient in irrigating

• Groundwater remediation
  • “Pump and fertilize” – irrigate with nitrate-containing groundwater
  • Pump and treat groundwater for drinking or irrigation use
  • “In situ” remediation – inject bacteria and chemicals underground

• Treat drinking water or provide alternate drinking water supplies
  • Bottled water, treatment systems on wells, surface water or other new sources, drill deeper wells, truck-in water to household tanks

Each option has very different associated costs, implementation timeframes, and effectiveness
WATER QUALITY MANAGEMENT IS NECESSARY

• Studies by CV-SALTS show:
  • There is lots of work to be done to address nitrate and salinity contamination, or water quality will continue to decline, hurting both drinking water and agriculture
  • Current management practices for the control of nitrates and salinity are not enough and more work is needed in order to prevent further contamination and to clean up the basins
  • The solution will likely mean more expensive treatment and management done by local groups
  • The solution will likely involve a combination of management techniques, and may need to be implemented by local groups
CV-SALTS RECOMMENDED NITRATE IMPLEMENTATION PROGRAM

- Creation of Management Zones to implement nitrate measures including drinking water improvement measures
- Nitrate permitting strategy
  - Allows additional nitrate use with implementation of management actions
CV-SALTS RECOMMENDED SALINITY CONTROL PROGRAM

- Reduce rate of salinity contamination of groundwater
- Protect groundwater quality by regulation
- New permitting approach that encourages cooperative studies leading to projects to reduce salinity
- Long-term process – 30-45 years
SGMA AND GROUNDWATER QUALITY

• SGMA requires groundwater to be managed to avoid worsening groundwater quality

• Local Groundwater Sustainability Agencies (GSAs) have been formed to manage groundwater basins

• SGMA requires basins to be managed to avoid long-term overdraft conditions

• GSAs can set goals for groundwater quality and have the authority to implement projects and management actions necessary to meet those goals

Sustainable Groundwater Management: http://www.water.ca.gov/groundwater/sgm/
The State Water Resources Control Board has several programs that can fund management and treatment of nitrate and other contamination problems – some programs are specifically for Disadvantaged Communities.

The California Department of Water Resources has funding for groundwater projects and programs.

There are potential other funding sources such as bond measures that will be voted on in 2018.

Community Water Center can help communities find funding sources.
FOR MORE INFORMATION

COMMUNITY WATER CENTER
EL CENTRO COMUNITARIO POR EL AGUA

http://www.communitywatercenter.org
Email: info@communitywatercenter.org
Phone: (559)733-0219
900 W. Oak Avenue, Visalia, CA 93291
ADDITIONAL INFORMATION
THE HYDROLOGIC CYCLE

Rainfall

Streams and Canals

Water Supply Well

Lake

Groundwater Aquifer

Figure adapted from: Union of Concerned Scientists, 2017. Getting Involved in Groundwater: http://www.ucsusa.org/cagroundwatertoolkit
THE HYDROLOGIC CYCLE

Rainfall

Infiltration from Lakes & Ponds

Infiltration from Creeks and Canals

From Lakes & Ponds

Inflows to a Groundwater Basin

Crop Irrigation

Landscape Irrigation

Crop Irrigation

Infiltration from Lakes & Ponds

Neighboring Groundwater Basin

Figure adapted from: Union of Concerned Scientists, 2017. Getting Involved in Groundwater:
http://www.ucsusa.org/cagroundwatertoolkit

PACKAGE - Page 26
THE HYDROLOGIC CYCLE

Outflows from a Groundwater Basin

- Exfiltration to Lakes & Ponds
- Loss from Evaporation
- Neighboring Groundwater Basin
- Exfiltration to Natural Creeks
- Pumping for Irrigation and Drinking Water
- Business and Household Use

Figure adapted from: Union of Concerned Scientists, 2017. Getting Involved in Groundwater: http://www.ucsusa.org/cagroundwatertoolkit
PURPOSE OF THIS TALK

- Build an understanding of groundwater quality issues in the Central Valley and how they can be solved:
  - Movement of groundwater and ways it can be influenced
  - Nitrate and salinity contamination issues in the Central Valley
  - Projections of future groundwater quality
  - How groundwater quality can be addressed in planning efforts
  - Potential projects to improve groundwater quality
  - Potential funding sources for groundwater projects
SGMA AND GROUNDWATER QUALITY

- SGMA requires basins to be managed to avoid “significant and unreasonable” degradation of groundwater quality, such as nitrate and salinity issues identified by CV-SALTS.
- Local Groundwater Sustainability Agencies (GSAs) have been formed to manage groundwater basins.
- GSAs can set goals for groundwater quality and have the authority to implement projects and management actions necessary to meet those goals.

![SGMA Undesirable Results Diagram]

- Surface Water Depletion
- GW Storage Reduction
- Lowering GW Levels
- Land Subsidence
- Seawater Intrusion
- GW Quality Degradation
THE COMMUNITY WATER CENTER

• Catalyst for community-driven water solutions through organizing, education, and advocacy

• Programs include:
  • Sustainable Groundwater
  • Safe and Affordable Drinking Water Solutions
  • Community Power and Engaged Leadership
WHAT IS CV-SALTS?

- Central Valley Salinity Alternatives for Long-Term Sustainability or CV-SALTS
- Coalition of agriculture, city, industry, and regulatory agencies working on sustainably managing salinity and nitrates in the Central Valley since 2006
- High levels of nitrates in groundwater can result in serious health concerns for people who drink the water and
- High levels of salinity can pollute the soil so that it can no longer grow crops

Figure adapted from: Nitrate Implementation Measures Study (NIMS) Final Report, 31 March 2016, CDM Smith.
CV-SALTS PROCESS

• Developed a Salt and Nitrate Management Plan (SNMP) for the Central Valley with the following goals:
  1. Ensure a Safe Drinking Water Supply
  
  Where reasonable, feasible, and practicable:
  2. Achieve Balanced Salt and Nitrate Loadings
  3. Implement Managed Aquifer Restoration Program

• The Central Valley Water Board is working with CV-SALTS stakeholders on amendments to the Central Valley Basin Plan, which will create additional requirements to control and reduce salinity and nitrates in the Valley

• Implementation strategies such as the formation of management zones, provision of replacement water, funding for projects and pathway to regulatory compliance for dischargers are expected
MOVEMENT OF GROUNDWATER

- Can be complex and vary significantly within a basin
- Groundwater flow direction and speed are influenced by:
  - Infiltration from irrigated water
  - Flow to and from interconnected streams/creeks
  - Groundwater pumping
  - Diverse natural geology beneath the surface (ancient creeks, confining layers of dense mud [Corcoran Clay])
  - Weather – rainfall and temperature
  - Underground flow from an adjacent groundwater basin

Movement of groundwater can concentrate, dilute, or move contaminants, such as nitrates

Figure adapted from: Union of Concerned Scientists, 2017. Getting Involved in Groundwater: http://www.ucsusa.org/cagroundwatertools
Extraction, or pumping, of groundwater has one of the greatest influences on groundwater movement.

- Cone of depression is formed.
- Can result in:
  - Shallower wells going dry.
  - Movement and change in concentration of pollutants.

Figure adapted from: Union of Concerned Scientists, 2017. Getting Involved in Groundwater: http://www.ucsusa.org/cagroundwatertoolkit
GROUNDWATER MODELS

- Groundwater computer models use mathematical formulas to simulate groundwater levels, groundwater quality, and how water moves underground.

- Are built primarily using available historical data:
  - Stream flow measurements,
  - Rainfall records,
  - Groundwater pumping records,
  - Soil and geological characteristics, and more.

- Better data – more confidence you can have in the model.

- Available data is *always* limited, and assumptions must be made.

DWR MODELING ADVICE

• All models and model results will have some level of uncertainty. Models can provide decision makers an estimate of the predictive uncertainty that exists in model forecasts. By gaining a sense of the magnitude of the uncertainty in model predictions, decision makers can better accommodate the reality that all model results are imperfect forecasts and actual basin responses to management actions will vary from those predicted by modeling. (1)

• Transport model codes add a layer of complexity beyond what is provided by groundwater-flow models. (1)

GROUNDWATER MODEL CALIBRATION

• Model calibration involves adjustment of various model parameters to match actual field measurements

• Model calculated groundwater levels in wells should reasonably match actual measured groundwater levels. For models that simulate water quality conditions, model results should be checked against actual groundwater quality measurements

• Sensitivity analysis involves varying particular model parameters to see how significantly the results change → additional field measurements may be needed for the most sensitive parameters

• The more data available, the better calibrated a model can be – but no model is perfectly calibrated
CV-SALTS MODEL CALIBRATION

• For calculating groundwater levels, CV-SALTS based their model on an established groundwater model (CVHM) and further calibrated the model with more information on local conditions.

• For modeling groundwater nitrate and salinity, CV-SALTS used a particle tracking model.

• A more limited calibration for groundwater quality was done because data on nitrate and salinity concentrations at specific locations and depths is less available.
ALTA IRRIGATION DISTRICT (AID) STUDY

- Located in Tulare, Fresno, and Kings Counties and the Kings Groundwater Subbasin (DWR Basin No. 5-22.08)
- Kings Subbasin is designated as critically overdrafted, with approximately 120,000 acre-feet (AF) per year of groundwater storage decline\(^{(1)}\)
- Detailed modeling studies have been conducted for this area as a part of the CV-SALTS work
- Goal: test application of policies, data analysis methods, and management approaches for salt and nitrate contamination for possible use Central Valley-wide

---

AID GROUNDWATER MODEL

- Model data inputs
  - Historical groundwater elevations
  - Geology – thickness of clay layers, hydraulic conductivity values
  - Location of wells
  - Historical nitrate and TDS concentrations in wells
  - Location of streams

Figures adapted from: CV-SALTS Management Zone Archetype Analysis Alta Irrigation District, 2016.
While most domestic community water systems provide safe drinking water, nitrates and TDS (salts) exist throughout the area at concentrations that threaten public health.

Nitrate concentrations in all zones of the aquifer exceed the drinking water standard of 10 mg/L.

TDS concentrations in upper zone (where most domestic drinking water wells exist) exceed 500 mg/L ➔ safe to drink but may have taste problems.

This presentation focuses on nitrate contamination.

Concentrations are higher in shallow groundwater because impacts are migrating downward from the surface.
• Nitrate contamination comes from many sources, but primarily from use of fertilizers and soil amendments, and manure generated by dairy facilities – the exact amounts of nitrate loading are not well tracked or monitored.

• Model makes assumptions about nitrate loading rates, movement of nitrates in groundwater, pumping influences, and recharge impacts.

• Several future scenarios modeled include an assumption that fertilizer application is reduced.
  • Plan A & Scenario 3 (shown on subsequent slides) assumes nitrogen loading is reduced by 20%.
FUTURE TRENDS – PRODUCTION ZONE

Current Nitrate

- >10 mg/L
- 7.6 - 10 mg/L
- 5.1 - 7.5 mg/L
- 2.6 - 5 mg/L
- <2.5 mg/L

Most areas exceed the MCL

Projected Nitrate in 50 years*

- >25 mg/L
- 10 - 25 mg/L
- 7.5 - 10 mg/L
- 5 - 7.5 mg/L
- 3.5 - 5 mg/L

Many areas more than double the MCL

Current TDS

- >1,000 mg/L
- 751 - 1,000 mg/L
- 501 - 750 mg/L
- 251 - 500 mg/L
- <2.5 mg/L

Projected TDS in 50 years*

- >1,000 mg/L
- 751 - 1,000 mg/L
- 501 - 750 mg/L
- 251 - 500 mg/L
- <2.5 mg/L

*Baseline scenario, no mitigation or other interventions implemented. Figures adapted from: CV-SALTS Management Zone Archetype Analysis: Alta Irrigation District, May 2016.
• Source control – more efficient use of fertilizer, improved irrigation efficiency, optimization of crop & field management

• Groundwater remediation
  • “Pump and fertilize” – irrigate with nitrate-containing groundwater
  • Pump and treat groundwater for drinking or reinjection to the groundwater basin
  • “In situ” remediation – inject bacteria and chemicals underground

• Use of alternate drinking water supplies – such as bottled water, treatment systems on wells, surface water or other new sources
EVALUATING POTENTIAL REMEDIATION PROJECTS

Models can be used to evaluate effectiveness of several potential groundwater remediation projects.

- Helps compare different scenarios based on:
  - Change in nitrate concentrations
  - Timeframe to reach 10 mg/L
  - Estimated costs for projects
  - Effectiveness of different options

- Serve treated groundwater as drinking water
- $2.2 million / year – $8.7 million / year

Figure adapted from: Nitrate Implementation Measures Study (NIMS) Final Report, 31 March 2016, CDM Smith.
EVALUATING POTENTIAL REMEDIATION PROJECTS

- Model predictions are not certain, but are particularly helpful comparing scenarios relative to each other.
- Model results should always be checked for consistency with water balance and conceptual understanding of the basin.
- Other factors outside of the model should also be considered when evaluating the appropriateness of a project.

- Treatment by ion exchange
- Lower pumping rate ≈ $9.3 million / year
- Higher pumping rate ≈ $17.1 million / year

Figure adapted from: Nitrate Implementation Measures Study (NIMS) Final Report, 31 March 2016, CDM Smith.
**Scenario 3**
- Crop irrigation efficiency is increased (80% of irrigation is by drip)
- Nitrogen loading is reduced (reduced fertilizer use by 20%)

**Plan A**
- Nitrogen mass loading the same as Scenario 3
- Treated groundwater injection, assuming 41 injection wells in the Dinuba area
- On-farm groundwater recharge implemented during winters (47,000 AF per year)
Scenario 3

- Crop irrigation efficiency is increased (80% of irrigation is by drip)
- Nitrogen loading is reduced (reduced fertilizer use by 20%)

Plan A

- Nitrogen mass loading the same as Scenario 3
- Groundwater injection, assuming 7 injection wells in the Cutler-Orosi area
- On-farm treated groundwater recharge implemented during winters (47,000 AF per year)
ESTIMATED COSTS FOR REDUCTION STRATEGIES

- Estimated costs for long-term nitrate management in the AID area – groundwater treatment and recharge

<table>
<thead>
<tr>
<th>Treatment Area</th>
<th>Total Annual Cost (and O&amp;M, annualized 20 years, 3% interest)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutler-Orosi Area (4 extraction wells)</td>
<td>$4.2 – $5.9 million</td>
</tr>
<tr>
<td>Dinuba Area (26 extraction wells)</td>
<td>$26 – $32 million</td>
</tr>
<tr>
<td>Total AID Area (615 extraction wells)</td>
<td>$615 – $773 million</td>
</tr>
</tbody>
</table>

Methods for contaminant modeling and treatment of groundwater contamination are always improving

LESSONS LEARNED

• Pump, treat, and serve projects can provide clean drinking water to communities, but do not significantly improve the groundwater quality within a reasonable time frame

• Restoration of groundwater quality across the Central Valley is not likely feasible; targeted local projects may have some benefit

• Projects should be implemented on a local scale, where there is control of pumping and other factors and sufficient knowledge of the soil and aquifer characteristics

• Pump, treat, and reinject projects are not practicable for large regional areas because there are too many uncontrollable factors that can impact the success of a project

• On-farm recharge has some benefits, but its viability depends significantly on the soil types in the specific area, and can potentially result in spreading contamination to deeper areas of the aquifer
Studies by CV-SALTS show:

- Work must be done to mitigate nitrate and salts, or water quality will continue to decline, affecting use of groundwater for both drinking water and for growing crops.
- Current management practices for the control of nitrates and salinity are not enough and more work is needed in order to prevent further contamination and to clean up the basins.
- The solution will likely mean more aggressive and expensive treatment and management options implemented by local groups.
- The solution will likely involve a combination of management techniques, and may need to be implemented by local groups.
CV-SALTS RECOMMENDED NITRATE IMPLEMENTATION PROGRAM

- Creation of Management Zones to implement nitrate measures including drinking water improvement measures
- Nitrate permitting strategy
  - Allows additional nitrate use with implementation of management actions
Goal for Salinity Management Strategy:

• Control the rate of degradation through a “managed degradation” program

• Implement salinity management activities to achieve long-term sustainability and prevent continued impacts to salt sensitive areas
  • Where reasonable, feasible, and practicable, protect beneficial uses by maintaining water quality that meets applicable water quality objectives and pursuing long-term managed restoration
  • Protect beneficial uses by applying appropriate anti-degradation requirements for high quality water
POTENTIAL SOURCES OF FUNDING

• SWRCB Groundwater Quality Funding – Site Cleanup Subaccount Program (SCAP)\(^{(1)}\)
  • For surface water and groundwater remediation projects
  • Priority given to disadvantaged and small communities
  • Continuous application process

• Proposition 1 funding for Groundwater Sustainability Plans and Projects\(^{(2)}\)
  • For projects benefiting severely disadvantaged communities
  • Phase 2 funding may be available in mid-2018

• Other potential funding sources are being developed (e.g., the Park-Water Bond, which will be voted on in June 2018; SNMP discharger responsibility requirements)

\(^{(1)}\) [https://www.waterboards.ca.gov/water_issues/programs/grants_loans/scap/]
\(^{(2)}\) [https://www.water.ca.gov/irwm/grants/sgwp/]
FOR MORE INFORMATION

COMMUNITY WATER CENTER
EL CENTRO COMUNITARIO POR EL AGUA

http://www.communitywatercenter.org
Email: info@communitywatercenter.org
Phone: (559)733-0219
900 W. Oak Avenue, Visalia, CA 93291
ADDITIONAL INFORMATION
Two permitting approaches:

- Conservative (similar to current)
- Alternative (studies leading to projects)

Three Phase Control Program

- Each phase – 10-15 years
- Regional Water Quality Control Board encourages Alternative approach that encourages collaborative projects
Status Report on Communication Strategies and Activities
CV-SALTS Project

Phase 1: Communication Plan and Written Materials Developed

In late 2016, with the pending release of the CV-SALTS Salt and Nitrate Management Plan (SNMP), it was clear to the CV-SALTS Executive Committee (EC) and the CV-SALTS Public Education and Outreach Committee (PEOC) that additional education and outreach was necessary to inform stakeholders about the SNMP and the associated regulatory modifications and improvements.

The Catalyst team was brought on board to support the ramp-up of education and outreach for the CV-SALTS initiative. The Catalyst team began by developing a comprehensive Communication Plan to support general outreach and education for the January 2017 SNMP release, 2018 Basin Plan Amendment process, and the 2018 start of implementation of the SNMP. Working with the PEOC members collectively and individually, the Communication Plan was developed to include goals, key audiences, prioritization of key audiences, key messaging, and suggested engagement tactics. The Communication Plan was developed to be flexible and allow for the appropriate level of education and outreach for SNMP-related milestones. A core principle of the Communications Plan was that CV-SALTS leaders and Central Valley Salinity Coalition members would be leaders and spokespeople for the program. The PEOC and the Catalyst team would develop supporting materials and provide coordination support for outreach and education activities.

Following the completion of the Communication Plan and the January 2017 release of the SNMP, the Executive Committee and PEOC agreed that the communications priority was to focus on the development of written communication materials that would best support the education and outreach efforts to key opinion leaders in all affected industries. A family of written materials was developed to serve as the foundational outreach and education tactics (see page 3). The written communication materials can now be used with the wide range of audiences prioritized in the Communication Plan to convey the purpose and regulatory recommendations of the SNMP.

Phase 2: Establish and Execute a Communication Strategy for 2018

The Communication Plan established the following goals. As 2018 begins, it is time for the PEOC and Executive Committee to revisit the overall communications strategy and set outreach/education priorities for 2018.

- Inform, educate, and raise awareness regarding the overarching salt and nitrate pollution challenge in the Central Valley.
- Inform, educate, and raise awareness regarding the SNMP, its associated policy recommendations, and suggested implementation timeline.
- Build support for adopting and implementing the SNMP and its associated policies.
- Change attitudes regarding regulations being “all bad” and communicate that the SNMP adds needed flexibility.
- Influence audiences that may have apprehension or concerns regarding the SNMP.
- Explain and promote the benefits of the SNMP.
- Ensure that stakeholders are adequately informed prior to each SNMP project milestone.
The key CV-SALTS activities in 2018 are the Basin Plan Amendment process and subsequent SNMP implementation planning and education. The overarching communication strategy for 2018 is to broaden the outreach and education effort when and where possible, and within resources available. The following are the proposed priorities for 2018:

- Continue to inform, educate, and raise awareness regarding the overarching salt and nitrate pollution challenge in the Central Valley.
- Brief key reporters and editorial boards about CV-SALTS and the Basin Plan Amendment process leading up to Central Valley Board and State Water Board actions.
- Inform, educate, and raise awareness regarding the Basin Plan Amendments among key representatives of the regulated community and other influencers.
- Build support for adopting and implementing the Basin Plan Amendments.
- Begin development of educational workshops for communities and regulated entities in high priority areas.

The following are the key 2018 milestones to focus the communication strategies for 2018.

1. **January 19, 2018**: Workshop, Regional Board to begin consideration of the Basin Plan Amendments
2. **March 12, 2018**: Workshop, Regional Board further consideration of the Basin Plan Amendments
3. **May 31, 2018**: Hearing, Regional Board consideration of approval of the Basin Plan Amendments
4. **July 2018**: State Board to consider approval of the Basin Plan Amendments
5. **September 2018**: SNMP implementation begins with groundwater actions in defined Priority Areas

Following conversations with PEOC members representing specific industry sectors, the following recommendations were made for continuing, and expanding where possible, the outreach and education effort in 2018. One of the key considerations for the PEOC and the January 2018 Executive Committee is the effort and involvement of CV-SALTS participants and Coalition members in the 2018 outreach and education activities. As outreach activities expand across the Valley, additional spokespeople are needed. The PEOC members do not have the bandwidth to expand their outreach and education efforts further. Other leaders are needed to increase involvement in education and outreach by undertaking activities such as making presentations and sharing the CV-SALTS Outreach Brochure with their constituents and others.

The following are actions, by milestone, for the EC and PEOC to consider adopting as the 2018 communication strategies.

**ACTIONS BEFORE JANUARY 19, 2018 WORKSHOP**

1. **IN PROCESS**: By industry sector, **review the Priority 1 and 2 audiences** outlined in the Communication Plan to identify audiences that have not been “touched” with information about CV-SALTS. Report to the PEOC at their January 2018 meeting with the intention of identifying tactics for coverage of the not yet “touched” audiences.
2. Work with EC/PEOC members to reach out to key leaders at the **Farm Bureau, the Agricultural Council of California, and the Western Growers Association** to assess their knowledge and position on CV-SALTS, with the intention of enlisting their support in educating their memberships.
3. **Set editorial board meeting** dates with the Sacramento Bee, Fresno Bee (and additionally newspapers recommended by the EC/PEOC) for meeting dates before July 2018 when the State Board is set to approve the Basin Plan Amendments. It can take time to get on the editorial board calendar, so it is recommended to start this process in early January 2018. The editorial board meetings also provide the opportunity to include the primary reporter for this subject area.
**ACTIONS BEFORE MARCH 12, 2018 WORKSHOP FOR DISCUSSION OF BASIN PLAN AMENDMENTS:**

4. Identify specific groups, organizations, associations, individuals, etc. that **do not or may not support** the Basin Plan Amendments. Schedule a briefing with these key influencers prior to the scheduled approval by the Regional Board in late May/early June.

5. Conduct an audit of 2018 events, conferences, workshops where CV-SALTS should be present and on the agenda. Once identified, schedule an appropriate presenter or panel.

6. Schedule, establish location, and agenda for two informational/educational workshops in priority areas of the San Joaquin Valley, one to occur in June 2018 and one in November 2018. These initial workshops will serve to develop the structure, format, and content for workshops in other areas of the Central Valley. The invitations would be the responsibility of all members of the Central Valley Salinity Coalition and the Regional Board. Content from these workshops could also be used to develop a Webinar that stakeholders could be informed about and view on their own time.

7. Review the existing PowerPoint presentations developed to date on CV-SALTS and the SNMP with the intention of creating one PowerPoint presentation for use by EC/PEOC/Coalition members to aid in making simple presentations. Industry specific slides would be made available for inclusion. This could also support Item 5 above.

**ACTIONS BEFORE LATE MAY/EARLY JUNE 2018 REGIONAL BOARD APPROVAL HEARING & BEFORE STATE BOARD HEARING IN JULY 2018**

8. Conduct editorial board briefings prior to the July 2018 hearing on the Basin Plan Amendment adoption (see item 3 re: setting editorial board meeting dates). These meetings should be attended by Pamela, Daniel, and three reps from regulated industries.

9. By industry sector, work with the EC/PEOC to identify stakeholders that will attend and express support at the Basin Plan Amendment hearing before the State Water Board in July 2018.

10. In June 2018, conduct the first outreach/education workshop in a high priority area of the San Joaquin Valley.

**ACTIONS BEFORE THE SEPTEMBER 2018 START OF IMPLEMENTATION IN PRIORITY AREAS**

11. Develop outreach and educational materials to explain in more detail the steps that dischargers will have to follow in the high priority areas. The approach could be a combination of written materials and/or a targeted Webinar on this topic. Identify and schedule presentations and panel discussions at high priority events for the regulated communities (see item 5 above).

12. In November, conduct the second outreach/education workshop in a high priority area of the San Joaquin Valley.
Summary of Communication Materials Available for Outreach and Education
as of December 2017

Written Materials

The first outreach tactic was to develop a family of written communication pieces that could be easily distributed and readily used to support the Communication Plan goals. The following is a list of the written materials developed from December 2016 to November 2017.

1. Communication Plan
2. CV-SALTS Fact Sheet, 2 pages
3. Overview of the SNMP, 3 pages
4. Overview of CV-SALTS and SNMP, 4 pages
5. Press Release – not issued
6. Seven Policy Summaries, 2 pages were reviewed and edited by Catalyst in February 2017
7. CV-SALTS Outreach Brochure – 11 by 17 printed
8. Spanish Versions of the 2-page Fact Sheet and the CV-SALTS Outreach Brochure
9. Five topic-specific inserts (Dairy, Sacramento Valley Ag, San Joaquin/Delta Ag, Publicly Owned Treatment Works, Oil and Gas) for distribution with the Outreach Brochure. The Safe Drinking Water insert is still in process, and will not be ready for approval until the February EC/PEOC meetings.
10. Status Updates for 2016 and 2017 were developed for the CV-SALTS website.

Outreach Tracking Tool

A Google Drive Outreach Tracking spreadsheet for PEOC members to easily enter outreach endeavors and future events is now online. The link to the spreadsheet is:

https://docs.google.com/spreadsheets/d/1UJjueg72j7p1C8qz5xcckV3I_OpxqZ5QDFg4b8Hal/edit#gid=1913590428

PowerPoint Presentations

Concurrently, Daniel Cozad CV-SALTS Executive Director, Central Valley Water Board staff, and PEOC members have developed PowerPoint presentations to use when discussing CV-SALTS, the SNMP, and the Basin Plan Amendments.
Snap Shot of Audiences Reached in 2017
Draft for CV-SALTS PEOC, January 2018

The following summarizes the audiences that have been contacted through 2017, as listed on the Google Drive Spreadsheet. This summary is intended to assist in identifying additional outreach that is needed before the SNMP related Basin Plan Amendments come before the State Water Board (scheduled for July 2018). We need to identify entities to reach out to, and then figure out how that can be accomplished. In some cases, for the entities not contact yet, it may be as simple as sending an email with the Outreach Brochure. And, please note, I may not have placed each entity that has been contacted in the right category – the idea is see what may have been missed at a glance.

**Priority 1 Audiences Per Communication Plan**

1. **NOT SURE** - Members of CV-SALTS (Chief Executives and PIOs/Governmental Affairs)
2. **NOT YET** - News Media Reporters and Bloggers
3. **YES** – 14 Irrigated Lands Coalitions, need to confirm that all Central Valley ILCs have been reached
4. **NOT SURE** - California Department of Food and Agriculture (CDFA)
5. **NOT SURE** - Lobbyists for CV-SALTS participants
6. **NOT SURE** – Influencers/Opinion Leaders Reaching Public Regulated Communities/Permitees (California Association of Sanitation Agencies (CASA) Conference/San Diego;
7. **SOME** – Influencers/Opinion Leaders Reaching Private Regulated Communities/Permitees (Independent Oil Producers’ Agency; KRWCA Board; Kaweah Delta Water Conservation District; Alta Irrigation District; Attorneys for Tule, Kaweah, Kings Coalitions; David DeGroot; Donald Ikemiya; Mark McKean, President of Kings Coalition; Kings Basin Water Authority IRMP monitoring subcommittee; CV-AG Water Advisory Group, AWAG (Oil and Gas); Central Valley Manufacturer’s Council/Modesto; Association of California Water Agencies, ACWA: Water Quality Committee, Planning Committee, SJR Water Managers Committee; Western States Dairy Producer Trade Assoc.; Dairy Farmers of America, Western Area Council; Dairy Cares Coalition Board; Wine Institute Environmental Committee;
8. **NOT SURE** - Industry Associations Reaching Public Regulated Communities Westlands Water District Board
9. **NOT SURE** - Industry Publications Reaching Public Regulated Communities
10. **SOME**- Industry Associations Reaching Private Regulated Communities (Edison Beneficial Reuse (Oil and Gas); Dairy Cares (Dairy), ILRP stakeholder meeting Central Valley (IrrAg); ILRP joint No/So Mtg with MPEP (IrrAg); ILRP Coalitions (IrrAg); South Valley ILRP Coalitions – SSJVWQC; Kaweah Basin Water Quality Coalition; Kings Basin Water Authority; Western States Dairy Producer Trade Assoc. (Dairy); California Independent Petroleum Association (Oil and Gas); Central Valley Dairy Representative Monitoring Program Board of Directors (Dairy); Western United Dairymen (Dairy);
11. **NOT SURE** - Industry Publications Reaching Private Regulated Communities
12. **NOT SURE** - Key Agricultural Organizations and Commodity Groups including CA Farm Bureau, County Farm Bureaus, Western Growers Association
13. **SOME (Need a list of those contacted)**- Targeted Environmental Organizations and Environmental Justice Organizations
14. **NOT SURE** - U.S. Environmental Protection Agency

**Priority 2 Audiences Per Communications Plan**

1. **NOT SURE** - Targeted Elected Officials (Governor’s Office, Local Staff of Federal Delegation, State Legislators, County Supervisors)
2. **NOT SURE** - Additional contacts within the Private Regulated Community (larger dischargers) including food processing, large farming operations, dairy operations, etc.
3. **SOME** - Oil and Gas Industry Groups: Western States Petroleum Association; California Independent Petroleum Association; Society of Petroleum Engineers; California Natural Gas Producers Association (CNGPA, www.cngpa.org);

4. **NOT SURE** - Additional environmental and environmental justice organizations.

5. **NOT SURE** - Municipal agencies and special districts

6. **NOT SURE** - Groundwater Sustainability Agencies

7. **NOT SURE** - Local and county stormwater management and flood agencies

8. **NOT SURE** - Regional Water Management Groups (IRWMP, etc.)

9. **NOT SURE** - CA Department of Water Resources and Bureau of Reclamation

10. **NOT SURE** - CVP Water Users and State Water Contractors

11. **NOT SURE** - Local Government Associations including:

    - CSDA – California Special Districts Association, http://www.csda.net/
    - CMUA – California Municipal Utilities Association, http://cmua.org/ contact@cmua.org
    - CRWA – California Rural Water Association, http://www.calruralwater.org/ info@calruralwater.org

12. **NOT SURE** - Other interested organizations with communications networks that could potentially be utilized for outreach

    - USDA Service Centers located throughout the Central Valley that provide connection to Farm Service Agency, Natural Resources Conservation Service, Rural Development Area Office, and Conservation District
    - UC Cooperative Extension
    - County Ag Commissioners
    - State Colleges and Universities in the Central Valley
Embedded Secure Document

Embedded Secure Document

Embedded Secure Document

The Problem – Unsafe Water
Many communities in the Central Valley have unsafe drinking water supplies as a result of groundwater contamination. The groundwater is polluted by fertilizers, farm animal waste, and aging septic tanks. These pollutants often have salts, nitrates, pesticides, heavy metals, and organisms that can cause disease. As a result, water from many private and domestic wells do not meet State safe drinking water standards.

What is the impact of contamination?
Current regulations do not address the need for safe drinking water in communities where groundwater is contaminated with nitrate and salts. Nitrates are a major cause of unsafe drinking water in the Central Valley. Nitrate comes from fertilizers, aging septic systems, animal feedlots, industrial waste and food processing waste. Many private and domestic wells are contaminated with nitrates. Drinking water with high levels of nitrate can create a health risk, especially to infants and pregnant women. Salt is another pollutant in the groundwater. Over the years, through agricultural, municipal, and industrial practices, salt has accumulated in the groundwater. High salt (salinity) levels can affect the ability to grow crops and also poses a threat to the region’s economy. About 1.5 million acres of land have high salinity levels. 250,000 acres are no longer useable for crop production.

What is being done?
Changes in regulations are needed to address this complex problem. A coalition of dischargers (growers, dairies, and municipalities), regulators (government agencies), environmental justice groups, and the Central Valley Regional Water Board (Regional Board) have formed the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS). The purpose of CV-SALTS is to develop a workable, comprehensive plan for managing salts and nitrate in a consistent and sustainable manner. Over the last few years, CV-SALTS used scientific studies to develop the Salt and Nitrate Management Plan (SNMP).

What is goal of the SNMP?
The top priority of the new regulations proposed in the SNMP is to provide safe drinking water supplies, while improving water quality by reducing salts and nitrates, and, where possible, restoring groundwater. When approved, the new regulations will focus actions in the areas of the Central Valley where the public health risks are greatest.

Progress
In 2018, the Regional Water Board will put into effect new regulatory options to address the nitrate entering the groundwater in areas with high nitrate levels. These areas include: Kaweah, Turlock, Chowchilla, Tule, Modesto, and Kings groundwater sub-basins and basins.

How can I learn more about CV-SALTS?
You are encouraged to participate and get involved now. For more information, visit www.cvsalinity.org.
The Problem – Unsafe Water
Many communities in the Central Valley have unsafe drinking water supplies as a result of groundwater contamination. In some areas, groundwater is polluted by fertilizers, farm animal waste, and aging septic tanks. These pollutants often have salts, nitrates, pesticides, heavy metals, and organisms that can cause disease. As a result, water from many private and domestic wells do not meet State safe drinking water standards.

What is the impact of contamination?
Current regulations do not address the need for safe drinking water in communities where groundwater is contaminated with nitrate and salts. Nitrates are a major cause of unsafe drinking water in the Central Valley. Nitrate comes from fertilizers, aging septic systems, animal feedlots, industrial waste and food processing waste. Many private and domestic wells are contaminated with nitrates. Drinking water with high levels of nitrate can create a health risk, especially to infants and pregnant women. Salt is another pollutant in the groundwater. Over the years, through agricultural, municipal, and industrial practices, salt has accumulated in the groundwater. High salt (salinity) levels can affect the ability to grow crops and also poses a threat to the region’s economy. About 1.5 million acres of land have high salinity levels. 250,000 acres are no longer useable for crop production.

What is being done?
Changes in regulations are needed to address this complex problem. A coalition of dischargers (growers, dairies, and municipalities), regulators (government agencies), environmental justice groups, and the Central Valley Regional Water Board (Regional Board) have formed the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS). The purpose of CV-SALTS is to develop a workable, comprehensive plan for managing salts and nitrate in a consistent and sustainable manner. Over the last few years, CV-SALTS used scientific studies to develop the Salt and Nitrate Management Plan (SNMP).

What is goal of the SNMP?
The top priority of the new regulations proposed in the SNMP is to provide safe drinking water supplies, while improving water quality by reducing salts and nitrates, and, where possible, restoring groundwater. When approved, the new regulations will focus actions in the areas of the Central Valley where the public health risks are greatest. The SNMP proposes changes to existing regulations to meet drinking water needs, improve agricultural, municipal, and industrial management practices, and reduce addresses the salt and nitrate discharges problem changing existing regulations to improve agricultural, municipal, and industrial management practices. These changes can help reduce public health risk, improve water quality, and protect and restore groundwater.

Progress
As a result, in 2018, the Regional Water Board will put into effect new regulatory options to address the nitrate entering the groundwater in areas with high nitrate levels. These areas include: Kaweah, Turlock, Chowchilla, Tule, Modesto, and Kings groundwater sub-basins and basins.

How can I learn more about CV-SALTS?
You are encouraged to participate and get involved now. For more information, visit www.cvsalinity.org.