

CV-SALTS Technical Memorandum

Date: April 15, 2010

To: CV-SALTS Technical Advisory Committee

From: Salt and Nitrate Sources Pilot Studies Review Knowledge Gained Subcommittee

Early in 2011, the CV-SALTS Executive Committee directed the Knowledge Gained Subcommittee to develop a framework for salt/nitrate identification studies by April 2011. This memorandum responds to this direction. An additional and more detailed report will be submitted in May to expand upon this memorandum.

PROCESS: Following review of the Salt and Nitrate Pilot Implementation Study (SNPS) report, the TAC established a voluntary review subcommittee, (Knowledge Gained Subcommittee) to evaluate and document what CV-SALTS learned through the experience and to examine the role of the SNPS in the development of Salt/Nutrient Management Plans and the larger CV-SALTS program. In the fall of 2010 the Executive Committee suspended all subcommittees in order to refocus the mission of the CV-SALTS. This memorandum responds to specific direction from the CV-SALTS Executive Committee.

RECOMMENDATION: The Knowledge Gained subcommittee submits this salt/nitrate identification study framework for adoption by the Executive Committee. This submittal is intended to meet the Progress Goal due in April:

Framework developed for salt/nitrate identification studies (Assess the validity of the salt source survey pilot studies. If the approaches need modification, identify the adjustments that will be made to make the approach useful in the rest of the region.) [from Knowledge Gained Subcommittee]

FRAMEWORK FOR SALT/NITRATE IDENTIFICATION STUDIES: The Knowledge Gained Subcommittee is producing a framework report that includes:

1. Description of the purpose of Salt/Nitrate Identification Studies
2. Study process
3. Technical principles
4. A list of the technical design questions for Salt/Nitrate Identification Studies
5. A technical outline of the contents of Salt/Nitrate Identification Studies
6. Examples of visualizations of results of Salt/Nitrate Identification Studies

This memorandum presents the final version of the first three sections of this framework report.

The Knowledge Gained Subcommittee is also producing a **final Framework Document that describes the final three sections in more detail .**

DESCRIPTION OF PURPOSE OF SALT/NITRATE IDENTIFICATION STUDIES: Salt/Nitrate Identification Studies serve several purposes:

- Studies develop information at appropriate regional scales for region-specific salinity problems
- , Studies enable prioritization of management efforts throughout the Basin
- Studies provide data that can be utilized in the development of Salt/Nutrient Management Plans required by the Recycled Water Policy
- Studies provide technical support for basin plan amendments
- Studies are a starting point for regulated regions' implementation activities.

Studies can vary in the level of detail, dependent on the scope and scale of salinity issues, the availability of data, as well as the urgency of salt and nitrate issues in the region.

STUDY PROCESS

Studies should be conducted in a stepwise fashion, as each step is dependent on the results of the previous step. All areas should complete Steps 1 through 4 and areas with more data and with a higher priority for management should complete Step 5 and will have greater detail developed in Steps 2 through 4.

Step 1: The first step in a Salt/Nitrate Identification Study is the **description of study area characteristics and delineation of the study region**. Study area characteristics should include climate, physiography, geology, hydrology, and hydrogeology. Delineation considerations should include: natural hydrological pathways (watersheds), water supply and wastewater infrastructure, existing salinity/nitrate regulation endpoints, and land use. The regulatory endpoints are used to inform temporal scales of the budgets. Use of GIS is recommended.

Step 2: The second step in a Salt/Nitrate Identification Study is **the development of a water budget**. A water budget is the characterization and accounting of water sources, water uses, uncontrolled water pathways, controlled pathways of irrigated return water and treated municipal and storm waters, and other water loss pathways (evapotranspiration, biomass). Water budgets identify constraints to the water budget (permit terms, environmental regulations, risk management, etc.). More than one water budget may need to be developed to capture shifts in water or wastewater management due to factors like hydrology (dry versus wet year water management). Data sources should be described and quality assessed and assumptions documented (see principles). The development of an accurate water budget is the foundation of salt and nitrate characterizations.

Step 3: The third step in a Salt/Nitrate Identification Study is **the development of salt and nitrate sources and budgets**. All salt and nitrate sources are identified with appropriate quantitative, location, and land use data. Salt and nitrate information is attached to elements of the water budget and simple mass balances are developed. For more complicated and data-rich areas, more complicated mass balances are developed. Significant salt/nitrate sources and sinks are highlighted. Data sources should be described and quality assessed and assumptions documented (see principles).

Step 4: The fourth step in a Salt/Nitrate Identification Study is to **synthesize and create visualizations of the budget information**. The transformation of data into information should be done in consideration of salinity issue(s) and regulatory endpoints. Minimum uniform requirements shall be developed so that different Studies can be integrated into a conceptual model and directly compared, while recognizing variability in data availability and temporal scales.

Step 5: The fifth step (for higher priority/more complex areas) in a Salt/Nitrate Identification Study is to **develop additional information needed to support effective management practices and alternatives**. High priority areas will likely view Salt/Nitrate Identification Studies as a tool to inform solutions. Additional information can include the collection of information to refine budgets or default values, to develop additional ways of characterizing salt/nitrate loading, trends, or accumulation, or other data to inform strategic priorities related to regulatory endpoints.

Additional Principles

Data availability: The accuracy of water and salt/nitrate budgets is largely dependent on the availability of accurate data. The availability of data varies broadly throughout the Central Valley. Available data should be supplemented by documented assumptions (preferably supported by references) where needed to develop budgets.

Data quality: The highest priority is to use data that is supported by quality assurance/quality control processes. Other data should be used after they are reviewed for obvious quality issues, and such data should be clearly documented as of lower quality. The quality of data varies broadly throughout the Central Valley. Uncertainty analyses should be conducted to determine whether improved data would improve budgets.

Default assumptions: CV-SALTS should develop a set of default assumptions for use in areas where data is not available. Sensitivity tests can be used to determine where areas should consider replacing default assumptions through data collection to improve budgets.

Clearly defined control volumes: Studies should employ a clearly defined control volume to accomplish a regional water budget and salt/nitrate load balances.

Participants: Over the past year, the Knowledge Gained Subcommittee has included:

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