Salinity Problems on the Lower San Joaquin River

Water supply and irrigation development in the San Joaquin Valley and the hydrologic and geologic characteristics of the Lower San Joaquin River (LSJR) are the principal reasons this section of the river struggles with salinity management. Salinity in the LSJR has degraded significantly since the late 1940s. In the 1920s municipalities and water districts built large scale storage projects on all three of the major tributaries to the LSJR (Stanislaus, Tuolumne and Merced). Even though this reduced flows in the LSJR, the quality remained good. In the late 1940s, the U. S. Bureau of Reclamation constructed Friant Dam on the main-stream San Joaquin River upstream of the LSJR as part of the Central Valley Project (CVP). Friant Dam diverted almost all of the high quality upstream San Joaquin River flow south into the Tulare Lake Basin and north to Madera County. As part of the CVP, water users along the western side of the LSJR exchanged their existing San Joaquin River water rights for water supplied via the Delta through the Delta-Mendota Canal, a major component of the CVP.

The CVP upstream diversion and water exchange with Westside water users led to the salinity issues now facing the LSJR. Part of the LSJR salinity increase resulted from the exchange of high-quality water from the San Joaquin River for more reliable, but higher salinity water imported from the Delta. The present hydrologic conditions in the Delta result in a large percentage of the flow and salt in the LSJR being re-exported to the San Joaquin River Basin via the CVP Pumps. The second impact on salinity in the LSJR came from the intensification of irrigation on the western side of the San Joaquin River. This intensified irrigation quickly lead to high water tables and soil salinity issues in both the new lands being brought under irrigation and the lands previously supplied with San Joaquin River water because the west side of the San Joaquin Valley is underlain by a number of discontinuous clay layers at shallow depths and the deeper continuous Corcoran Clay that underlies much of the west side. The Corcoran Clay obstructs vertical movement of applied water in areas subject to shallow water tables and leads to refluxing of the dissolved salts this water carries. In many cases this intensification of irrigation was conducted on salty soils that predominate on the Westside of the San Joaquin River Basin. This salty water is removed by constructed subsurface drains and is ultimately returned to the LSJR. Because of the diversion of upstream San Joaquin River water by the CVP, salty drainage water from the Westside land was being discharged to the LSJR without the benefit of any upstream dilution water.

These actions occurring simultaneously resulted in a significant degradation of the LSJR in less than a decade and prompted a declaration by the California Legislature in 1961 that the LSJR was impaired (California Water Code § 12230 – 12232). In the 1975 Basin Plan, water quality degradation in the LSJR

was identified and the LSJR was classified as a Water Quality Limited Segment. At that time, it was envisioned that a Valley-wide Drain would be developed and the subsurface drainage water flows would then be discharged outside the Basin, thus improving river water quality. It is unlikely that this will occur in the near future.

The State Water Board in 2000 concluded in D-1641 that salinity management in the LSJR needed to improve and that the actions of the CVP are the principle cause of the salinity concentrations exceeding the Vernalis water quality objective as they had 1) cut off high quality flows at Friant Dam, 2) had provided higher salinity water to the west-side lands in lieu of the upstream higher quality flows and 3) had not provided drainage water management for the subsurface drainage flows from the CVP entering the LSJR. Exceedance of the Vernalis salinity objective contributes to impacts to Southern Delta agriculture. The State Water Board directed the Central Valley Regional Board to proceed with development of salinity water quality objectives in the LSJR and develop, if needed, a TMDL for meeting these objectives and the Vernalis salinity objective established as part of the State Water Board review of the Bay-Delta Water Quality Control Plan. In 2005, the Central Valley Board adopted a salt and boron TMDL for meeting the Vernalis objective. The control program under this TMDL is phased to allow for implementation actions to meet the Vernalis salinity objective as well as any future objectives on the LSJR.

Both the State and Regional Water Boards recognize that with the absence of a drain, increasing groundwater accretions along the river, and continued development in the basin, that the LSJR remains the only presently viable option for salt export from the basin. The basin plan policy allows this use provided that beneficial uses are protected both in the LSJR and downstream as higher salinity water has contributed to impacts to agriculture both in-basin and in the southern Delta downstream . Beneficial use protection must be the center piece of developing a salt management policy for the LSJR. To ensure all beneficial uses are defined and water quality objectives established to protect those uses, there needs to be a review of the Basin Plan and changes made, where needed. In addition, the Basin Plan review needs to consider ways to a) reduce or eliminate the intentional use of water to dilute salt as this water may be lost to other beneficial uses; b) reduce salt imported into the basin and c) export excess salt out of the basin while still protecting beneficial uses.

To conduct the review of beneficial uses and water quality objectives on the LSJR, CV-SALTS has established the Lower San Joaquin River Committee as a stakeholder effort to conduct this review and

recommend changes to the Basin Plan, where needed, that will enable the Board to use its regulatory tools to maximize beneficial use protection and salt management in the basin.