

Changes in oxygen levels, ph, and oxidation reduction potentials of stored water within the reservoir are cyclic and could induce variation in mineral solvency. These changes have been observed in existing reservoirs on Stony Creek and would be anticipated, therefore; in the proposed reservoirs. It should be noted that the depths of Newville and Paskenta Reservoirs behind the dams would be about 370 feet and 225 feet, respectively. Effects of these cyclic physical-chemical changes on mineral solvency could be detrimental to water quality in these deep reservoirs.

Observations by the California Department of Water Resources on existing reservoirs on Stony Creek for turbidity, dissolved oxygen, ph, and temperature indicate that stratification is a common phenomenon during the spring and summer months followed by seasonal turn-overs in the fall.

The Bureau of Reclamation is proposing a multi-level outlet at Paskenta Dam, but a firm decision has not been made for the outlet structure at Newville Dam. Both types of structures are presently under consideration. A single bottom outlet would limit the capability to withdraw the best quality water from stratified zones for release downstream. Under stratification, water from the lower zones would be colder, deficient in oxygen and could contain higher concentrations of sediments, dissolved nutrients and reduced metals as iron and manganese and could cause significant detrimental effects to any fishery to be developed below Newville Dam and to other downstream uses outside of the study area.

Some of the detrimental effects of impoundment in Newville Reservoir may be of a transient nature, since the operation of this reservoir will be integrated ultimately with the Rancheria Reservoir as part of the Glenn Reservoir Complex of the California Water Plan. Under this operation, the hold-over time will be considerably reduced when north coastal water is redistributed through Newville, thus reducing the adverse effects of water quality changes attributable to long-term storage. Nevertheless, stratification is to be expected in this deep reservoir. Before the import of north coastal waters, the requirements for multi-level inlets at Newville Reservoir might be difficult to justify since drought releases would be infrequent and the annual releases to the local agricultural service area (1500 acres) are considered minor. It could be stated that the high costs for a multi-level outlet at Newville could exceed any benefits derived from the mitigation of water quality detriments.

The evaluation for the need of a multi-level outlet structure in the original construction of Newville Reservoir must, at the very least, weigh the water quality detriments during an interim period against the additional first costs and savings which could accrue by deferring construction of a multi-level inlet until some future date when the reservoir will be used as a redistribution center for north coastal water. The interim period must reflect the schedule of the California Water Plan to transport north coastal

waters through the west side of the Sacramento Basin to Central and Southern California. This period could be less than 20 years under the present schedule for water exportation. In view of this schedule, it is recommended that consideration be given to providing multi-level outlet structures not only at Paskenta as planned, but also at Newville.

#### EFFECTS ON SACRAMENTO - SAN JOAQUIN DELTA

Evaluation of the impact of the project upon water quality must consider the effects within the local service area and also the more widespread external effects of the project. Within the study area, degradation of the mineral quality is anticipated from impoundment and from the consumptive use of project water. Deterioration results from natural evaporation of stored and applied irrigation water and from solution of salts during transmission of applied water through the ground water system. Thus increases in TDS and specific minerals can be expected in both surface and ground water drainage from the study basins. Within the study area, the degradation is not expected to create any problems since water quality is expected to be good for planned uses despite the degradation and, furthermore, reuse of return flows will be minimal.

The more widespread effects of the project on the beneficial uses of water in the Central Valley and the Sacramento - San Joaquin Delta system should be considered. Preservation of water quality in the Sacramento River Basin and in the Sacramento - San Joaquin Delta is dependent upon adequate treatment of municipal and industrial wastes prior to discharge and upon the maintenance of adequate streamflow to provide conveyance of residual conservative and non-conservative waste to ultimate disposal in the Pacific Ocean. Dilution or conveyance water is particularly important in the disposal of drainage from irrigated agricultural land, since adequate treatment systems usually are not feasible. Maintenance of acceptable water quality must be considered in the development of water supplies for irrigated agriculture since the resulting diminution of flow and production of concentrated return flows could have significant adverse effects in the basin.

The long term carry-over yield of the Central Valley Project would be increased by 383,000 acre-feet annually as a result of this project. At present this 383,000 acre-feet constitutes a part of the annual Sacramento - San Joaquin Delta outflow. The value of this outflow to Delta waters uses during dry years could be significant and its loss through consumptive use could result in serious degradation of water quality in the Delta.

Water quality standards are presently being prepared in compliance with the Federal Water Quality Act of 1965 (PL 89-234). It is most probable that the maintenance of these standards will be dependent primarily upon the maintenance of an adequate outflow from the Delta for the purpose of conveying conservative wastes out of the Sacramento - San Joaquin River Basins and for repelling the incursion of sea water. The maintenance of this Delta outflow during the critical summer months is dependent upon the integrated operation of all units of the Central Valley Project (CVP) and the State Water Plan. Because the Paskenta-Newville Unit is only one of many units of the CVP and since the operation of the CVP is complex, it is not possible to relate the required Delta outflow in a direct manner to the 383,000 acre-feet annual yield to be developed in Paskenta-Newville. Therefore, the operation of the entire CVP, including all existing and future units, should recognize and avoid depletion of Delta outflow below that which will be necessary to maintain a water quality at least equal to the standards which will be established by the State of California and the Federal Government.

#### EFFECTS OF PROJECT CONSTRUCTION

During the construction of the project, adequate measures must be taken to protect both surface and ground waters. Provisions should be included in contract specifications so contractors would be cognizant of requirements to protect water quality in the work area. Silt detention basins should be constructed at all work areas to eliminate excessive turbidity leaching from earth work. In equipment maintenance areas, special precautions should be taken to contain spilled fuel, lubrication products and wash water. Sewage from construction camps should be contained on land. All construction activities affecting water quality should comply with requirements of local and state water quality control authorities. Comments from the Federal Water Pollution Control Administration should be requested by the construction agency during the preparation of project plans and specifications in compliance with Executive Order 11288.

## X. BIBLIOGRAPHY

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APPENDIX

APPENDIX A

EXTRACTS  
FROM RWQCB RESOLUTION NO. 67-6  
DOMESTIC WASTE DISCHARGE REQUIREMENTS  
STONY GORGE RESORT IMPROVEMENT DISTRICT  
ELK CREEK, GLENN COUNTY

ADOPTED SEPTEMBER 23, 1966

WHEREAS, the Stony Gorge Resort Improvement District is located adjacent to Stony Creek near the community of Elk Creek in Glenn County; and,

WHEREAS, treated domestic wastes will be utilized for irrigation of District owned lands; and,

WHEREAS, sewage effluent may reach Stony Creek which is tributary to the Sacramento River; and,

WHEREAS, known downstream uses of the receiving waters are irrigation, fishing, fish propagation and recreation which includes water contact sports; and,

WHEREAS, it is the intent of the Central Valley Regional Water Quality Control Board to protect the receiving waters for their established beneficial uses and to prevent the disposal from causing a nuisance or a pollution; therefore be it

RESOLVED, that the following requirements shall govern the nature of the waste disposal from the Stony Gorge Resort Improvement District, Elk Creek, Glenn County:

1. The waste discharge shall be adequately disinfected.
2. The waste discharge shall not cause the dissolved oxygen content of the receiving waters to fall below 5.0 mg/l at any time.
3. The waste discharge shall not cause floating or suspended materials of recognizable waste origin in the receiving waters.
4. The waste discharge shall not cause sludge deposits.

5. The waste discharge shall not cause visible oil or grease slicks on the receiving waters.
6. The waste discharge shall not cause fungus, slimes, or other growths in the receiving waters.
7. The waste discharge shall not cause concentrations of materials in the receiving waters which are deleterious to human, plant, animal, or aquatic life.
8. The waste discharge shall not cause a pollution of usable ground or surface waters.
9. Neither the waste discharge nor the disposal system shall cause a nuisance by reason of odors or unsightliness.

Figure 1

