

EXECUTIVE SUMMARY

Kleinfelder Inc (Kleinfelder) on behalf of the Bureau of Reclamation Sacramento Region (Reclamation) has prepared this engineering and condition assessment evaluation of improvements within the concession areas located on Federal land at Lake Berryessa, California. The assessment of the seven concession areas--Putah Creek Resort, Rancho Monticello, Lake Berryessa Marina, Spanish Flat Resort, Steele Park Resort, Pleasure Cove Resort, and Markley Cove Resort-- included buildings, waste water systems, potable water systems, roads, parking lots, boat ramps, electrical systems, shoreline development, marinas and environmental hazards. The assessment yielded recommendations for each system at each resort for removal or retention for possible future reuse. Recommendations are supported by planning level cost estimates for improving the service life of facilities and achieving compliance with current construction codes.

Kleinfelder assembled a team of senior professional specialists and began by preparing lists of regulatory and code compliance criteria. The team utilized information provided by Reclamation, performed detailed site visits of each resort, and prepared topographical mapping for future engineering use. The mapping product was compiled at 1"=200' with a 5' contour interval using NAD 83/NAVD 88 control monuments. The topographic maps provided were compiled in both metric units and standard English units (feet). Per Reclamation guidance, the NAD83/NAVD88 control monuments, established at the lake by Reclamation, were utilized for the basis of the coordinate systems. Unfortunately, these datums were not the basis for either of the previous topographic mapping products provided by Reclamation. This means that the new mapping products produced by MPS cannot be registered to the older products without some manipulation. The process to correct the datum conflicts would consist of a horizontal datum shift and rotation (NAD 27 to NAD 83), as well as a vertical translation of about 3 feet (NGVD 29 to NAVD 88). There would be some inherent loss of accuracy, primarily in the vertical component, in the conversion process, however, since the topographic mapping was performed for planning level assessments only, the merged product would still be suitable for this level of engineering analysis.

The buildings were evaluated first and were reported separately. A summary of that separate report is included in this report as Chapter 3. Primary findings of the building condition assessment was estimated service life for buildings. Cost estimates to replace or bring buildings to code was not included in Kleinfelder's scope of work and has not been provided. The other improvements are assessed for each resort in this report. The assessments provide comparison against code criteria if constructed at present. Costs are based on upgrade or removal and replacement of systems depending on condition and based on meetings with Reclamation concerning the envisioned future use plan.

Wastewater systems were found in general to be of very poor quality. The team found that for each concession the sewers are in a generally deteriorated condition and need replacement. Each sewer line should be individually tested to determine the useful service life of the components. Each of the lift stations was found to be unacceptable. The lift stations would require, at a minimum, additional reliable pumping capacity, new instrumentation and controls, a functional alarm system, and standby power facilities in order to be adequate. In addition, the structures housing the pump stations are generally substandard. These conditions make these lift stations unreliable; coupled with the location of many of the stations, the risk of failure leading to contamination of the lake is considered very high. The force mains connecting these lift stations to the wastewater retention ponds are questionable and should be replaced unless proven sound through testing. The ponds where used, are undersized. Spray disposal that is being performed should be ceased immediately because the wastewater that is being discharged is minimally treated and the potential for human pathogenic contact is very high. Rather than replace all of the sewerage in kind, studies are recommended regarding alternatives such as combined systems or pumping to publicly-owned systems.

Potable water systems were found to be in better condition than the sewerage. Residual chlorine testing at the taps must be conducted before any upgrades to the water treatment or storage facilities are planned. For systems to be retained, verification of minimal leakage is needed. Recommended improvements include additional onsite storage tanks to extend the chlorine contact times, and storage tanks and better mixers to increase the effectiveness of the polymer solution for turbidity removal. Some of the existing storage tanks were observed to be leaking.

Marinas were found to be in generally substandard condition. The concessionaire marinas include the wide use of non-encapsulated foam billet floats. Many of the docks are not recommended for further use due to the cost involved with upgrading them with encapsulated foam billets and new decking. It is more economical to use a new dock that meets current guidelines and Reclamation's specifications. Many deficiencies in the fueling systems were noted relative to today's code. Most common was piping that used improper materials and is inadequately supported. Other issues included lack of filling procedures/alarm and/or containment at the shore tank and minor leaks.

An engineering evaluation of pavements and road was made. The remaining life of existing pavements is estimated to range from near zero to approximately eleven years. To achieve a design life of 20 years all existing pavements require rehabilitation varying from overlays to complete reconstruction. Realignment, widening, additional parking, striping, and additional controls should all be considered. Detailed recommendations for specific road segments are contained in the resort specific sections of this report. Serious concerns regarding fire truck access exist with regard to some dwellings on gravel roads or short driveways.

Electrical systems ranged in service capability from inadequate to suitable for long term use and each system had components which ranged from poor to good condition. Code violations were often noted, some of which are of immediate concern.

Shoreline developments in current use include wood (both treated and non-treated), shotcrete, masonry block, poured-in-place concrete, and gabion baskets. The majority of the walls are at or very near failure due to material deterioration, significant cracking, out ward tilting, or foundation failure. Retaining structures which appear to have a long remaining service life are noted in the report.

A hazardous materials/waste environmental assessment did not reveal significant concerns with regards to hazardous materials. Hazardous findings were limited to paints, oils, used oil being recycled, and small quantities of weed killer. The larger environmental concerns are with the sewage systems.

The costs for upgrade or removal and replacement of systems at each concession area are summarized in the following table.