

## (1.0) Executive Summary

This report describes the building and plant energy analysis performed on the New Braunfels Regional Rehabilitation Hospital (NBRRH) using Trane Trace 700 software. Included in this report are a summary of the design load estimation, an analysis of these results, and an energy and operating cost study. In order to run a complete load calculation and energy model, factors such as weather data and building construction had to be considered, and a number of assumptions about the building and occupant and process loads had to be made.

The results of the load estimation were analyzed in two different ways: by a broader, system-level approach and by a detailed, zone-level approach. Both analyses yielded peak heating and cooling load results that were much lower than expected values based on ASHRAE Fundamentals values and the actual designed capacity of existing systems.

The facility as a whole is modeled to use about 108 tons of cooling, while the design documents prescribe systems with a capacity of about 169 tons of cooling. The heating load of the Trace model came out to be about 550 MBh and was similarly lower than the designed systems, which prescribe 1,320 MBh of heating. A likely cause of these discrepancies is the assumption of the miscellaneous loads in circulation and therapy areas, as discussed in this report.

Using the loads calculated by the Trace model, an energy and economic analysis was also performed on the NBRRH. Though the model may be underestimating the energy used in the actual facility, this analysis is still useful because it gives a clear picture of which areas of the building are comparatively using the most energy and where improvements could be made.

The cooling system was determined to be the largest energy consumer in the building, which is expected for a facility in the American southwest. The monthly energy and operating cost profiles included in this report are good indications of the distribution of energy use throughout the year and could be used to make energy- and cost-saving decisions to improve the facility.

Also included in this report is a summary of harmful emissions as a result of the energy use discussed. Carbon dioxide, equivalent carbon dioxide, and solid waste were determined to be the pollutants emitted in the largest quantity, though several other harmful pollutants occur as a result of the mechanical heating and cooling processes.