

Commercial

Salvation Army Camp Wonderland Sharon, MA

Profile

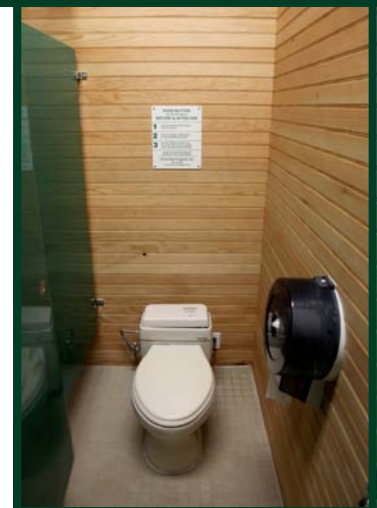
- 87-year old camp in need of waste treatment system upgrade
- Seasonal flow rate exceeding 10,000 gpd yielding the need for a Groundwater Discharge Permit
- Nitrogen loading above the 10mg/liter DEP maximum allowance
- Within 100' Buffer Zone and Riverfront Resource area of Sucker Brook
- 16 cabins that sleep 12-18 campers, each with 4 toilets
- Year-round conference center with an estimated flow of 5,400 gpd

Challenge

- Reduce nitrogen levels and obtain necessary Groundwater Discharge Permit from DEP
- Avoid building costly onsite waste treatment plant
- Cabins with crawl spaces and no basements

Solution

- Installed 17 Clivus waste treatment systems in the cabins
- Creative "half-basement" concept allowed for ease of installation and maintenance
- Replaced 54 traditional toilets in the cabins with Nepon 3-ounce foam-flush toilets
- Reduced toilet-water usage by 97%
- Reduced solid waste by 95%
- Composter liquid end product containing nitrogen and phosphorous is sent to a centralized holding tank
- Utilized Bioclere™ nitrogen reduction system for the conference center
- Cabins now discharge greywater only
- Lowered Nitrogen concentration for the entire camp to 4.27mg/liter !!
- Innovative engineering by Norwood Engineering of Norwood, MA, and Norfolk RAM of Plymouth, MA
- Architectural services by Nancy Allison of Newbridge Architecture, Sharon, MA





The shallow crawl spaces under the cabins initially posed an installation problem. Creative thinking and design resulted in open mini-basement like areas excavated and built to accommodate the composters. Various types of doors and bump outs were utilized for easy access and maintenance.

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