

DESIGN MODIFICATIONS TOWN OF BUCKLAND WASTEWATER TREATMENT PLANT (WWTP), Shelburne Falls, Massachusetts

CLIENT:

Town of Buckland, Massachusetts

PROJECT DESCRIPTION:

Replacement of the conventional floating surface aeration units with a fine bubble diffused aeration system, modifications to the aeration tanks to prevent short circuiting of the influent flow, and the installation of new positive displacement blowers with energy efficient motors and variable frequency drives. The new aeration system uses approximately 50% less brake horsepower than the previous floating aerators.

TOTAL PROJECT COST

\$ 150,000

COMPLETION DATE

December, 1997



PROJECT DRIVERS

The existing surface aerators were not performing efficiently for quite a number of years. The aeration tank residual oxygen values, which normally deplete during hot weather, became dangerously low. In addition, the Mohawk Trail Regional High School wanted to connect to the sewer system. For the regional high school wastes to receive adequate treatment, the Town of Buckland retained ARI to design improvements to the plant, receive bids to upgrade the aeration system and perform construction management services.



PROJECT FEATURES

Complete Mixing The grid of fine bubble diffusers, shown on the picture above, covered the entire tank bottom which resulted in more efficient mixing of the tank contents. The previous surface aerators did not mix the entire contents of the tank creating areas of solids build up which reduced the overall aeration tank volume available for treatment. The aeration tanks had to be frequently cleaned to restore the tank volume.

Continuous Aeration In an effort to reduce energy consumption, the Town operated the previous floating surface aerators in cycles of 10 minutes on and 10 minutes off. The new fine bubble diffusers will be operated continuously, providing even oxygen distribution.

New Variable Speed Positive Displacement Blowers and Premium Efficiency Motors As part of the new

system, ARI designed an air supply blower, powered by a 93% efficient motor and a variable frequency drive to control the speed of the motor. The speed can be turned down to match oxygen needs, thereby saving energy.

Western Massachusetts Electric Company Rebate (WMEC) The new aeration system received a rebate from WMEC for the premium efficiency motor and variable frequency drives.

New Influent Distribution Piping The previous design of the influent weirs caused the incoming wastewater flow to short-circuit from the tank without receiving treatment. A new influent drop box and new piping were constructed in both tanks requiring the flow to pass through the new fine bubble aerators before exiting the tank. All of the incoming wastewater resides in the aeration tanks for a longer time and receives treatment.

Corporate Headquarters
1732 Main Street
Concord, MA 01742
Tel. (978) 371-2054
Fax (978) 371-7269

