Dissolved Oxygen Control in the Activated Sludge Process
Mike Rousey, Hach Company, Loveland, Colorado

The Activated Sludge Process, which reduces Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS) up to 95%, is used in more than 40% of all wastewater treatment plants (WWTPs) in the United States today.

**Maintaining bacterial activity**
As wastewater enters the treatment plant, larger solids settle out in the primary clarifiers. What remains are organic suspended solids that do not settle out or that float on the surface of the primary clarifier. The activated sludge process relies on aerobic bacteria in the wastewater to convert the organic suspended solids into more stable solids that can be removed by the process.

Plant personnel must constantly adjust the Return Activated Sludge (RAS), which re-seeds beneficial bacteria in the aeration basin, and the Waste Activated Sludge (WAS), which dumps bacteria. Carefully controlling these streams maintains the population of bacteria needed to reduce organic suspended solids to inorganic settleable solids.

**Containing power costs**
The activated sludge process requires the proper level of oxygen for the aerobic bacteria to survive. Yet, aeration in municipal activated sludge plants accounts for almost 40% of all power consumption costs in the facility.
Efficient plant operation maintains only the amount of DO in the activated sludge process critical to supporting the aerobic bacteria while keeping power costs under control.

**LDO for activated sludge**
The HACH LDO™ Dissolved Oxygen system uses luminescence technology to monitor and control DO levels in aeration basins. Unlike traditional DO measurement systems that use an anode, cathode and electrolyte, the LDO Probe does not consume oxygen and is not poisoned by wastewater components.

The HACH LDO system incorporates a long-life sensor that requires less maintenance than oxygen- and electrolyte-consuming probes. It comes with an industry standard, three-year warranty on the DO Probe and a one-year warranty on the DO Sensor.