

**In Lagoons**, or ponds, waste is broken down through use of various bacteria, including both aerobic and anaerobic bacteria (see glossary for definitions). In one type of lagoon, aerobic bacteria eat away at the pollutants using up the oxygen in the process. Anaerobic bacteria eat other pollutants and release nitrogen and phosphorus, which feed algae. The algae, in return, replace oxygen used up by the aerobic bacteria.

Now - after completing both Primary and Secondary Treatments - some 90% of the pollutants in the wastewater have been removed.

### C. Sludge Disposal and Reuse

Sludge disposal or reuse has become one of the most difficult parts of reclamation. With the upgrading of wastewater reclamation plants to secondary or even advanced treatment, the amount of sanitary sludge, also referred to as **biosolids**, has increased. It is anticipated that by the year 2000 New Jersey will be producing 14 million dry metric tons of sludge processed into products for reuse. It is difficult to find an acceptable way in New Jersey to handle biosolids. Some of the options that are no longer used are placing the sludge in landfills or placing treated sludge into the ocean. The practice of ocean disposal was discontinued in March of 1991 in New Jersey and in July of 1992 for the New York agencies. Options which are still available in New Jersey are as follows:

- **Land application.** Biosolids which have been stabilized can be spread on farmland as a soil conditioner and source of natural organic fertilizer. Special trucks are used to apply the liquid sludge directly to the land and then the soil is turned over and the nutrients penetrate into the soil. The amount of biosolids applied must be limited to the amount of nitrogen that will be utilized by the crops to avoid groundwater contamination. When properly done, this process returns nutrients to the soil to be utilized again in the food cycle.
- **Composting** is a process where biosolids are mixed with a bulking agent (wood chips) and allowed to "cook" through the action of naturally occurring microorganisms. The finished compost is separated from the bulking agent and used for landscaping or land reclamation projects.
- **Chemical Stabilization** is the mixing of biosolids with chemicals such as lime or cement kiln dust to make a soil like mixture that can be used on farms, to reclaim landfills, or as a construction material.
- **Pelletization** of biosolids involves drying of the sludge through various methods and forming pellets from the solids. The pellets can be used as a fertilizer component or burned for energy recovery.

