infecting agent

Small-capacity chlorinators which inject gaseous chlorine into a water system are available and easy to operate Injection pumps which supply high concentration chlorine solutions to the system at a proper rate are preferable because of the ease and safety of operation

Standby equipment should be maintained at all chlorinating stations, together with an adequate supply of spare parts Gas masks which are effective against chlorine and a small bottle of ammonia to test for leaks should be kept just outside of areas in which chlorine is stored or used Masks should be inspected at regular intervals, and authorized employees should be trained in emergency procedures

The chlorinator should be adjusted to leave a chlorine residue of about 0 2 mg/L in the water after 20 minutes of contact between chlorine and the untreated water Test kits are available which will measure residual chlorine rapidly

Small quantities of water for emergency use may be disinfected in one of several ways Commercial preparations should be used according to the manufacturer's instructions Boiling water for five minutes, or adding four drops of household bleach (hypochlorite solution, 4 percent available chlorine) or two or three drops of common tincture of iodine to a quart of water and allowing it to stand for 30 minutes will also produce safe drinking water Its flatness and medicinal taste can be partially removed if it is aerated after disinfection by being poured from one container to another

Water storage

Reservoirs or standpipes for treated water should be completely enclosed and located so that accidental contamination is impossible The reservoir should be large enough to hold a 48-hr reserve supply of treated water Vents should be fitted with screened downspouts well above flood level Entrance manholes should be enclosed by watertight frames at least 6 in higher than the surrounding surface and fitted with watertight covers extending at least 2 in down the outside of the frames When not in use, the cover should be closed and locked

A reservoir permits full utilization of a smaller well and pump and still provides a buildup for peak demand Quality of water is generally improved by aeration

Sewage and Garbage Disposal

In some outlying districts and rural areas, industrial plants must provide their own sewage disposal systems If there are state or local ordinances governing disposal, they must be adhered to In addition, the recommendations given in the USPHS *Individual Sewage Disposal Systems* can be used as a guide for providing safe disposal of sanitary sewage from toilets, washrooms, showers, and kitchens The disposal of process waste requires separate facilities Many states and health departments require prior examination of all plans concerning disposal treatment

Provisions should also be made for the storage and collection or disposal of garbage and refuse

Building drains and sewers

The in-plant sanitary sewage collection system should conform to local codes, and the recommendations of American Standard and Sanitary Corporation's "National Plumbing Code" should also be considered

Every fixture should be properly trapped and vented by means of drain(s) and stack(s) serving it, to prevent the discharge of sewer gases into the building and to assure proper draining Traps and especially grease interceptors (such as those placed in waste pipes serving the plant cafeteria and kitchen) and interceptors designed to collect other particular foreign materials should be of adequate size, located for easy access, and should be cleaned periodically Be sure not to (*a*) install a type trap that is prohibited by the local code, or (*b*) place a trap in a prohibited location

The building drain and sewer should be constructed of extra-heavy cast iron, bell-and-spigot pipe with drainage fittings This material is less susceptible to clogging and much easier to clean than other materials, and it provides good "insurance" when installed under floors which would be expensive to tear up Lead or other suitable material should be used for joints The sewer should be tight