

20—Industrial Sanitation and Personnel Facilities

contaminants (a) those which usually have no toxicologic effect, but may give an undesirable taste or appearance to the water, and (b) those which constitute a health hazard and, if present, are grounds for rejecting the water supply. Standards under consideration for limiting mercury as a contaminant, propose values between 0.002 and 0.005 mg/L. (See EPA reference at end of chapter.) A limit of 0.5 mg/kg of fish is used currently.

Criteria for asbestos fibers, if present as a discharge from an industrial process in the surrounding area, may be less than those present in already treated or natural water. Information on proposed fibers testing and standards are available from the American Waterworks Assn., see References.

Temperature criteria which affect the limiting concentrations of fluoride in drinking water are given in Table 20-B. Other factors influencing the limiting concentrations of these contaminants, particularly in combination with other substances, are given in the *USPHS Drinking Water Standards*, published in 42 C.F.R., part 72. These Standards also serve as a guide to radioactive substances in water supplies.

If the degree of contamination from the substances previously discussed is within recommended limits, the water supply source may be used, provided its bacteriological quality is acceptable. Standards for bacteriological quality are specified in the *USPHS Manual of Recommended Water-Sanitation Practice*.

The equipment necessary to treat water and make it potable depends on the degree of contamination and the likelihood that the source will become more heavily contaminated later. These factors can be evaluated only on the basis of a thorough sanitary survey of the water source. Such a survey will determine not only the type of treatment necessary, but also the nature and frequency of periodic laboratory tests of the source water and the treated water (Fig. 20-1).

Wells

The safest source of water is often a drilled well whose intake is well below the water table. Such wells show a reliable yield and are reasonably free from bacterial contamination and finely suspended fibers. If both well

and city water are used, there should be no cross-connection between the two systems. Be sure to check the local code.

The wellhead should be carefully located away from sewage lines, septic tanks, and sewage drainage fields or process waste disposal systems. The following distances are often considered adequate for separation: sewers, pit privies, and septic tanks, 50 ft; seepage pits and disposal fields, 100 ft; cesspools, 150 ft. Process waste disposal systems require special consideration. As soil and drainage conditions vary from one location to another, approval by local health authorities is recommended.

The *USPHS Manual of Individual Water Supply Systems* recommends that the casing for such wells be made of wrought iron or steel with threaded couplings or welded joints. "Stovepipe" or sheet metal casings are not recommended.

To prevent contamination of the underground water by seepage of surface waters, the space between the casing and the surrounding area should be sealed with a cement grout to a minimum depth of 10 ft below the finished ground level or floor. As a further precaution, the casing should be grout-sealed to the lowest impervious stratum it passes through.

The well casing should extend 6 in. above the pump platform, which should be of reinforced, waterproof concrete at least 4 in. thick and continuous with the grout seal which surrounds the well casing. The platform should be designed so that water spilled at the wellhead will drain away from the casing. The joint between the casing and the concrete pump platform should be sealed with an asphalt caulking compound.

The top of the well casing should be at least 2 ft above the highest known floodwater mark. The pump should be self-priming and designed so that it makes a watertight seal with the well casing. The wellhead should not be covered over by paving or other material which would make access difficult.

Both submersible and turbine pumps must be considered. Submersibles are located in the well and do not require a pumphouse.

A safety factor is provided by two wells and two pumps. An automatic alternator can take effect if either unit fails.