For the handling of chlorine and chlorinators, the U. S. Public Health Service[37] stipulates the following safety requirements:

1. Suitable gas masks and a small bottle of ammonia for testing for leaks should be kept at convenient points immediately outside the room or enclosure in which chlorine is being stored or is in use. Gas masks should be inspected at regular intervals and kept in serviceable condition. Note:—All purpose masks offer adequate protection only when the concentration of acid gases does not exceed two per cent—See "Safe Practises Pamphlet #64 National Safety Council".

2. Chlorinating equipment and cylinders of chlorine should be housed preferably n separate buildings above the ground level.

3. The room or building housing chlorinators in service should be maintained at a temperature above 60 F, but never in excess of the normal summer temperature. The cylinders of chlorine should be shielded, where necessary, from excessive heat or cold. Direct heat should not be applied to cylinders of chlorine nor should hot water be poured over them or come in contact with the cylinder valve.

4. Adequate ventilation should be provided for all enclosures in which chlorine is being fed or stored.

5. All joints of tubing connecting chlorine cylinder and chlorinators should be kept absolutely tight and inspected frequently to insure tightness. Tubing should slope upward from the cylinder.

LEGAL REGULATIONS

In a number of states, the water used for humidification, even in industrial plants, is required to meet drinking water standards insofar as bacteriological quality is concerned. A ruling of the *U. S. Department of Agriculture*, Meat Inspection Division prohibits the use of chromate in water used for air washing when the air later contacts foodstuffs[38].

There is an ever growing consciousness on the part of public health officials of the necessity for regulations to *protect* potable water supplies. Attesting this is an ordinance[39] now in effect in Detroit, Michigan, which stipulates in part:

"No physical connection shall be maintained between lines carrying city water and pipes, pumps, or tanks supplied from any other source. Where dual supplies are necessary or desired, lines carrying city water must be protected against back flow of polluted water by an *atmospheric gap*—Secondary supplies and emergency sources shall include: surface waters from rivers, lakes, ponds lagoons, and reservoirs; well waters both deep and shallow; any supply of water which has been stored, held, or reserved after being used for industrial purposes; cooling water, or water which has in any way been treated, processed, or has been subjected or exposed to any contamination of a bacteriological or chemical nature; and water from any other source than the city supply."

The U. S. Public Health Service stipulates:

"Salts of barium, hexavalent chromium, heavy metal glucosides, or other substances with deleterious physiological effects, shall not be allowed in the water supply system."

The same agency recommends that the concentration of the substances listed be held below the the values cited in following table:

Substance	Max Concentration, ppm	Substance	Max Concentration, ppm
Copper	3.0	Arsenic	0.05
Iron & Manganese (Total)	0.3	Selenium	0.05
Magnesium	125.0	Phenols (Total)	0.001
Zinc	15.0	Poly-phosphate of Sodium	10.0
Lead	0.1	pH Value @ 25C	10.6
Fluorine	1.0		

The Board of Directors of the *American Water Works Association* has accepted these values as standard for *all* public water supplies in the United States[40]. While their action is not binding, prudence dictates that no form of treatment should be used that will result in raising the concentration of the substances listed above the value cited.

Since virtually all of the permissible chemicals used for scale, slime, and corrosion control have deleterious, physiological effects if taken internally in *relatively large doses*, they should always be carefully *proportioned*. To insure this, the Detroit ordinance stipulates that the chemical feeding device must have the following major characteristics:

"1. There shall be a visible means of checking the quantity of material being applied by the feeding device.

2. A water metering device, sealed to prevent tampering, shall be installed to measure the flow of water being treated.

3. The device shall be constructed so that in the event of back-flow or vacuums, the maximum amount of material that may be possibly back-siphoned from the device or any of its attachments or parts shall not exceed one fluid ounce.

4. Should there be a failure of the water metering device or the water supply, the feeding device shall automatically cease operating."

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