Environment

The huge water requirements of the chemical industry—now the nation's third largest user—make water quality and availability increasingly important factors for site selectors. Legislation enacted in recent years has forced planners to pay close attention to pollution control standards.

All 50 states have had their water quality standards approved entirely or in part by the Federal Water Pollution Control Administration (FWPCA). Recently a state-by-state summary of key standards was put together for the first time. Surprisingly, it was not the FWPCA that did the job. Instead it was handled by an American Public Health Assn. (APHA) subcommittee headed by TVA Health Director F. E. Gartrell, assisted by the APHA Engineering and Sanitation Section. A portion of the study, covering standards for surface industrial water, is summarized in the tables starting on p. 80.

Contrary to widely held opinions, there is considerable variation in state standards. Take the dissolved oxygen (DO) standard, for example. Minimum allowable DO (as milligrams per liter or percent saturation) is the single most important standard to chemical site evaluators. As a rough rule of thumb, a 2-mg./l. standard is considered to be one industry can live with comfortably, while a 6.0 mg./l. value is pegged "extremely tough."

California, Wyoming and Washington have set the standard at 6 mg./l. or higher. But a few states such as Connecticut, Maine, Illinois, Indiana, Massachusetts, Virginia and Wisconsin require 2 mg./l. or lower.

Other standards—notably turbidity, taste, odor, color and solids—may also be important, depending upon the nature of the chemical plant's waste effluents. These standards also exhibit state-by-state differences. Moreover, they are generally less specific than the straight numerical DO standards.

Although chemical plant site experts see little point in "running from tough standards," the criteria do make a difference: Plans for two nonferrous metals plants in Puerto Rico are now on the shelf, because of standards that call for a 4.5 mg./l. DO, no wastes that interfere with the esthetics of the waters and other specifications.

No compilation of ground water standards has yet been published. Ground water standards may prove important in the future as companies are forced to use costly deep-well disposal for wastes. Availability of ocean waste disposal services is also looming more important.

Waste Cost.: The price tag for pollution control is high. A recent FWPCA study on the organic chemicals industry estimated that water waste-treatment facilities can increase installed capital equipment costs 40% or more. Between '69-'73, the organic chemical industry would have to shell out $182.5 million to remove 10% of its biological and chemical oxygen demand waste and 65% of its suspended solids. Removal levels of 83%, 13% and 71%, respectively, for biologic oxygen demand, chemical oxygen demand and suspended solids would require $242.6 million, while 98%, 30% and 89%, respectively, would up the ante to $608 million.

Cleaner Air: Establishment of air quality standards is not nearly as far advanced as are water standards. The National Air Pollution Control Administration (NAPCA) is still designating regional air control regions. At last count, 16 regions had been formally designated and another 41 had been proposed. NAPCA has issued air quality criteria and control technology data for sulfur oxides and particulate matter, will follow with similar studies for other pollutants.

Once criteria and control data have been issued for a pollutant and control regions have been designated, a complicated process involving standards, hearings and implementation and enforcement plans will be initiated that can take over a year to produce standards.

So far, no firm sulfur oxide or particulate standards have emerged. But NAPCA's criteria for setting the standards suggest they'll be tough. The oxide criteria report, for example, emphasizes that there are deleterious effects to man at concentrations as low as 0.04 ppm.

NAPCA's control data reports present detailed appraisals of various methods and equipment, along with estimated costs. As in the case of water, the costs will be high, although some pollutants—mainly sulfur dioxide—will have recovery values. NAPCA is sponsoring a number of research projects to improve technology. Pollution control is being spurred by financial assistance programs (mandated by state law) now operative in the following 28 states:

Arizona, Arkansas, California, Connecticut, Florida, Georgia, Idaho, Illinois, Indiana, Maine, Massachusetts, Michigan, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, Washington, Wisconsin and West Virginia.

In addition, Pennsylvania offers financial aid sanctioned by administrative regulation. Several states, including Utah and Maryland have legislative studies under way.

The incentives take a variety of forms. Most common are exemption from personal property taxes (e.g., Arkansas), fast depreciation (Arizona), exemption from ad valorem equipment and structures taxes (Connecticut), exemption from local taxes for stated period of time (New Hampshire), operating loss deductions (New York); credit against state income tax (Oregon).

Quantity: The large chemical complexes now in vogue make water—and lots of it—a major site criterion. The cooler the water is, the better, for it can reduce the investment in heat-exchange equipment. Occasionally, plants can manage on ground water, but usually surface water is required. That means location on or near the big, drought-resistant rivers. There are less than 200 rivers in the U. S. with minimum flows over 50 cu. ft. per second *(CW Oct. 5, '68, pp. 94-95)*. For companies whose plant needs at least 100 cu. ft/second, the list numbers only 150 (excluding Alaska). Sea water is generally avoided because of high equipment corrosion costs.

Piping water in is expensive. Duval, now opening a 1.5 million tons/year sulfur mine in the arid Northwest area, was forced to install a 36-in., 38-mile-long water line and a 40-million-gal. reservoir. Cost of the water supply system hasn't been disclosed, but it is estimated that the tab was at least several million dollars.

The adequacy of domestic water resources in the year 2000 has recently been evaluated by the Geological Survey. Nationally, projected demand will be 173% of potentially assured supply. Only in three regions, New England, Ohio, and the South Atlantic Eastern Gulf, will future water requirements be easily met. Economic growth may be handicapped in nine regions: Eastern Great Lakes, Lower Mississippi, Upper Missouri-Hudson Bay, Lower Missouri, Western Gulf—Rio Grande, Pecos, Colorado, Great Basin, and Central and South Pacific.