

Monsanto Company
800 N. Lindbergh Boulevard
St. Louis, Missouri 63116
Phone: (314) 864-1000

February 18, 1970

Dear Sir:

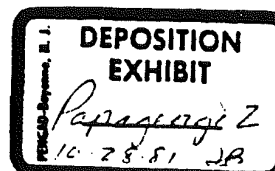
Recently several newspaper and magazine articles have been published indicating that Polychlorinated Biphenyls (PCBs) have been discovered at some points in some marine, aquatic and wildlife environments. The quantities detected are said to be in the parts per million and parts per billion categories.

It is claimed that the PCBs found strongly resemble chlorinated biphenyls containing 54% and 60% chlorine by weight. Products which are sold by Monsanto under the trade names of Aroclor® 1254 and 1260 do contain chlorinated biphenyls. In addition to Aroclor® 1254 and 1260, Monsanto sells certain functional fluids containing Aroclor® 1254. These include Pydraul® 625, Pydraul® AC, Pydraul® AC - Winter Grade, Pydraul® 540, Therminol® FR-3 and certain dielectric formulations. Several other companies around the world also produce products containing chlorinated biphenyls.

As your supplier of Aroclor® 1254 and 1260 and formulated products containing 1254, we wish to alert you to the potential problem of environmental contamination as referred to in the newspaper and magazine articles.

We would like to point out the following additional facts:

1. Products such as Pydraul® 90, 135, 230, 312, A-200, F-9, 150, and 60, Turbinol® 153 and Therminol® FR-1 and FR-2 are not formulated with Aroclor® 1254 or 1260.
2. PCBs with a chlorine content of less than 54% have not been found in the environment and appear to present no potential problem to the environment.



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We have developed, and are now testing, new formulations to replace the Aroclor® 1254 and 1260 components in our Pydraul® products. The new products appear to be equal in performance and to have similar physical properties.

We feel that all possible care should be taken in the application, processing and efficient disposal of these products to prevent them becoming environmental contaminants. Of interest to you may be an article in Chemical Week, October 29, 1969, regarding water pollution standards set by each state in the Union. It is attached. This article reflects that good manufacturing practices in the future may require that no product used by any company should find their way into waterways.

We realize that you have marketed or may now market transformers and other electrical equipment containing dielectric fluids which include Aroclor® 1254 and 1260. Although these fluids are sealed into such equipment it is recognized that occasionally the fluid may be lost through leaks resulting from equipment misuse or equipment repair necessitating replacement of the fluid. Since the dielectric fluid contained in this equipment is only an incidental part of the over-all unit manufactured by you, we are not notifying the purchasers of such equipment of the potential environmental contamination problem described in this letter. We do recommend, however, that you notify such equipment users of this problem.

Sincerely yours,

Don Olson
Donald A. Olson
Director of Sales
Functional Fluids Group

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Attachment

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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 Costs: 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 46% 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 85%, 13% and 71%, respectively, for biologic oxygen demand, chemical oxygen demand and suspended solids would require \$242.6 million, while 98%, 36% and 89%, respectively, would up the ante to \$603 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).

Quantifying: 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 (*CEN* Oct. 5, '65, 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., 33-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.

For the first time, a summary of water quality standards set by all 50 states.

	pH Allowable		Temperature (°F) allowable		Dissolved Oxygen (minimum, mg./l. or %)	Other Requirements
	Range	Deviation	Maximum	Increase above ambient		
Alabama	6.0-8.5	1.0	90° (24 hrs.) 95° (any 8 hrs.) 93° (cooling water)	10% — 10°	2.0 at 5 ft. or more depth; less than 10 ft.	Radiation: Low, Color, Taste and Odor, Toxic Substances: Only in amounts that would not render waters unsuitable for industrial cooling and process-water supply purposes. Solids: Free from waste materials that cause unsightly or putrescent conditions or interfere directly or indirectly with industrial use.
Alaska	7.0-8.0	0.5	70°	—	5.0	Radiactivity: Not to exceed limits of PHS Drinking Water Standards. Turbidity: No imposed values that would interfere with established levels of treatment. Color: True color less than 50 color units. Taste and Odor: Shall not unreasonably impair esthetic considerations. Solids: No dissolved solids above natural conditions causing corrosion or scaling problems. No visible evidence of either floating solids or sludge deposits. No imposed sediment loads that would interfere with established treatment levels. Toxic Substances: Chemical constituents should be below concentrations found to be of public health significance.
Arizona	6.5-8.6	0.5	93°	5°	—	Radiactivity: Not to exceed 1/30 of the MDCU value given for continuous occupational exposure in NBS Handbook G5. Turbidity: 50 JCU (streams); 25 JCU (lakes). Color: Free from waste materials in amounts sufficient to change existing color enough to interfere with industrial use or to create a nuisance. Taste and Odor: Free from wastes in amounts sufficient to produce enough taste and odor to create a nuisance or interfere with industrial use. Solids: Free from wastes that would be unsightly, putrescent, odorous or in amounts that would interfere with industrial use. Toxic Substances: Free from wastes toxic to human, animal, plant or aquatic life or in amounts that would interfere with industrial use.
Arkansas	6.0-9.0	1.0 (24 hrs.)	95°	5°	4.0 (average for any cross section)	Radiactivity: "Rules and Regulations for the Control of Ionizing Radiation," Arkansas Board of Health, apply. Turbidity: No distinctly visible increase, due to wastes. Color: Shall not be increased to the extent that it interferes with industrial use, present or future. Taste and Odor: Must not cause offensive odors or otherwise interfere with industrial use. Solids: No distinctly visible persistent solids, bottom deposits or sludge banks due to wastes. Toxic Substances: Must not be present in amounts toxic to human, animal, plant or aquatic life.
California	6.5-8.5 7.0-8.6 (Coastal waters)	—	71.6° (fresh water)	None that would cause ecological change or harm aquatic life (coastal waters)*	6.0 Coastal water; 5.0 (unless naturally lower)	Radiactivity: Shall not exceed 1/10 of the MPCU values given for continuous occupational exposure in NBS Handbook G5. Turbidity: Free from wastes that could alter water's existing turbidity. Color: Free from substances attributable to wastes that produce detrimental color. Taste and Odor: No substances that impart foreign taste or odor. Solids: Dissolved solids in fresh water must not exceed 300 mg./l. at any time; annual mean: 175 mg./l. Settling solids must not be able to change nature of stream bottom or harm aquatic environment. Toxic Substances: At all times free from concentrations harmful to humans, aquatic life or wild or domestic animals.
Colorado	5.0-9.0	—	93°	—	3.0	Radiactivity: Not to exceed 1/30 of the 100 hr.-week values in NBS Handbook G5. Turbidity: Must not interfere with established levels of treatment. Color: Wastes present must not cause appreciable change in color or interfere with industrial use. Taste and Odor: Free from wastes that cause odor or appreciable change in taste. Solids: Free from wastes that are unsightly, putrescent or odorous or would interfere with use. Toxic Substances: Free from wastes in concentrations or combinations sufficient to harm human or animal life.
Connecticut	6.0-9.0	—	—	None unless it does not exceed recommended limits for industrial use	2.0	Radiactivity: Limits to be approved by appropriate state agency. Turbidity, Color, Taste and Odor: None in such quantities that would impair industrial use. Solids: Limited to small amounts that may result from discharge of appropriately treated wastes. Toxic Substances: Free from chemical constituents in concentrations or combinations harmful to human, animal or aquatic life.
Delaware	6.5-8.5	—	—	5°	50%* or 4.0	Radiactivity: Alpha emitters limited to 3 pc/l.; beta emitters, to 1,000 pc/l. Color, Taste and Odor: None in concentrations that cause odor, taste or odor. Solids: Free from unsightly and malodorous substances due to floating solids or sludge deposits. Toxic Substances: None in concentrations harmful (synergistically or otherwise) to humans, fish, shellfish, wildlife or aquatic life.
Florida	6.0-8.5	1.0	—	—	4.0	Radiation: Gross beta—1,000 pc/l. (in absence of Sr-90 and alpha emitters). Turbidity: 50 JCU. Color: Must not render water unfit for industrial cooling or process-water supply purposes. Taste: Must not render water unfit for industrial use. Solids: 0.001 maximum. Solids: Dissolved solids must not exceed 1,000 mg./l. monthly average; 100 mg./l. Must be free from settling wastes that are unsightly or deleterious or other wastes that settle to form putrescent or objectionable sludge deposits. Toxic Substances: Free from wastes harmful to human, animal or aquatic life. Cu, 0.5 mg./l. Zn, 1.0; Cd, 0.05; Pb, 0.05; Fe, 0.5; As, 0.05; F, 10.0; Cr, none detectable.

pH Allowable Temperature (°F) allowable			Dissolved oxygen		Other Requirements
Range	Deviation	Maximum	Increase above ambient	(mg/l, or %)	
Georgia 5.0-5.5	—	53.2°	10° (above intake)	2.5 3.0 (daily average)	Radiocactivity: Must conform to state statutes. Turbidity: Color, Taste and Odor: Free from wastes that cause objectionable taste and odors or interfere with industrial use. Solids: Free from wastes that are unsightly, putrescent or otherwise objectionable or would interfere with industrial use. Toxic Substances: No wastes in concentrations that would prevent fish survival or interfere with industrial use.
Hawaii 6.5-8.5	—	—	—	4.5	Radiocactivity: Not to exceed 1/10 of the values given by NRS Handbook 60. Turbidity: Free from soil particles from erosion caused by land development or agricultural use. Taste and Odor: Wastes, after dilution and mixing, must not interfere with industrial use. Toxic Substances: Free from substances in concentrations harmful to human, animal, or marine life or that make waters unsuitable for industrial use.
Idaho 6.5-9.0	0.5	—	2° Only if water 68° or less	75% (at seasonal low)	Radiocactivity: Not to exceed limits of '62 PHS Drinking Water Standards. Turbidity: No objectionable turbidity that can be traced to a point source. Solids: No floating or submerged material, no sludge deposits that could adversely affect industrial use. Toxic Substances: No wastes of other than natural origin in concentrations of public health significance or that could adversely affect industrial use.
Illinois 5.0-9.0	—	95°	—	2.0 3.0 (for 16 hrs. in any 24-hr. period)	Color, Taste and Odor: Free from wastes that produce color, odor or taste in such a degree as to be objectionable. Solids: Free from floating wastes that settle and form unsightly, deleterious or putrescent deposits. Toxic Substances: Free from wastes in concentrations or combinations harmful to human, animal, plant or aquatic life.
Indiana 5.0-9.0	—	95°	—	1.0 2.0 (daily average)	Color, Taste and Odor: Free from wastes that produce color, taste or odor in such a degree as to be objectionable. Solids: Dissolved solids must not exceed 1,000 mg/l; monthly average 700 mg/l. Must be free from unsightly, putrescent, deleterious or otherwise objectionable wastes. Toxic Substances: Free from wastes in concentrations or combinations harmful to human, animal, plant or aquatic life.
Iowa —	—	—	—	—	Color, Taste and Odor: Free from wastes that produce color, taste or odor in such a degree as to be detrimental to industrial use. Solids: Free from floating wastes in amounts that would be unsightly or deleterious or other wastes that settle to form putrescent or objectionable sludge deposits. Toxic Substances: No wastes in concentrations or combinations detrimental to human, animal or aquatic life or to industrial use.
Kansas 6.5-9.0	—	90°	—	4.0°	Turbidity: No increase that causes substantial visible contrast with natural appearance or that is detrimental to industrial use. Color: Discharges of color-producing substances limited to concentrations not detrimental to industrial use. Taste and Odor: Concentrations limited to those that would not result in noticeable offensive odors or otherwise interfere with industrial use. Solids: Free from floating debris or material in amounts that would be unsightly or detrimental to industrial use. Toxic Substances: Petroleum substances must be maintained below concentrations detrimental to industrial use.
Kentucky 5.0-9.0	—	95° 75° (Dec.-Feb.)	2°/hr 10°/day	—	Color, Taste and Odor: Wastes must not create a nuisance. Solids: Dissolved solids must not exceed 1,000 mg/l; monthly average 750 mg/l. No floating wastes in unsightly or deleterious amounts; no other wastes that settle to form putrescent or objectionable sludges. Toxic Substances: No wastes in concentrations or combinations harmful to human, animal, plant or aquatic life.
Louisiana 6.0-9.0	—	96.3°	5.4°	50%	Radiocactivity: Specific limits set for all radioactive isotopes released as waste. Solids: Free from wastes that would produce floating masses, sludge banks or films on bottom, either organic or inorganic. Toxic Substances: No wastes in concentrations or combinations harmful to animal or plant life.
Maine 6.0-9.0	0.5°	90°	—	2.0°	Radiocactivity: Not to exceed '62 PHS Drinking Water Standards. Turbidity: Color, Taste and Odor: Free from wastes that impart turbidity, color, taste or odor or interfere with industrial use. Solids: Free from sludge deposits, solid refuse and floating debris. Toxic Substances: No chemical or inorganic wastes from waste sources harmful to humans or that adversely affect industrial use.
Maryland 5.0-9.0 (unless natural)	—	100°	—	4.0 (unless naturally lower)	Color, Taste and Odor: Free from waste materials that change existing water or produce waste and odor to such a degree as to create a nuisance or interfere with industrial use. Solids: Free from wastes that float, settle to form deposits, create a nuisance or interfere with industrial use and are unsightly, putrescent or odorous. Toxic Substances: Free from toxic wastes that interfere with industrial use or that are harmful to human, plant, animal or aquatic life.
Massachusetts 6.0-9.0	—	90°	—	2.0	Radiocactivity: None in concentrations harmful to human, animal or aquatic life. Turbidity, Color, Taste and Odor: None in concentrations that would hinder industrial use. Solids: None allowed except that which may result from the discharge from wastewater treatment facilities; petroleum hydrocarbons limited. Toxic Substances: None in concentrations or combinations harmful to human, animal or aquatic life.

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Water quality standards

	pH Allowable	Temperature (°F) allowable	Discussed oxygen	Other Requirements		
	Range Deviation	Maximum	Increase above minimum	(minimum) mg/l (5%)		
Arkansas	Normal for area, 6.0-7.0; 6.5-7.5 in swamps	—	90*	7*	3.0	Color: Must not render water unfit for industrial cooling. Must not affect taste and odor, make water unsuitable for industrial cooling. Toxic Substances: Must not make water unfit for industrial cooling.
North Dakota	6.0-9.0	0.5	93*	10*	3.0 (for 16 hrs./day)	Radioactivity: No discharge allowed unless materials are properly sealed or otherwise rendered innocuous. Solids: Suspended solids must not exceed 1,000 mg/l monthly average; 750 mg/l. Must be free from floating or other wastes that settle to form putrescent or objectionable deposits or that are unsightly or objectionable. Toxic Substances: No concentrations or combinations harmful to human, animal or aquatic life.
Ohio	5.0-9.0	—	95*	—	1.0 (daily average)	Color, Taste and Odor: Free from wastes that produce color or odor to a degree that causes a nuisance. Solids: Suspended solids must not exceed 1,000 mg/l monthly average; 750 mg/l. Must be free from floating or other wastes that settle to form putrescent or objectionable deposits or that are unsightly or objectionable. Toxic Substances: No wastes in concentrations or combinations harmful to human, animal or aquatic life.
Oklahoma	6.5-8.5	—	93*	3*	4.0	Radioactivity: Average concentration at points of controlled release shall not exceed State Board of Health Radiation Protection Regulations. Turbidity: None that causes visible contrast with natural conditions. Color: None that is perceptible in concentrations detrimental to industrial use. Taste and Odor: No concentrations that would cause offensive odors or taste to water or otherwise interfere with industrial use. Solids: Free from floating debris, bottom deposits or other materials. Toxic Substances: None in quantities that make water unfit to human, animal, plant or aquatic life.
Oregon	6.5-9.0	—	—	2* (only if water 70° or less)	5.0	Radiation: Shall not pose external hazard. Turbidity: 500 above natural. Color, Taste and Odor: No concentrations, combinations or conditions especially offensive to human senses of taste or smell, unless no floating solids, noxious or insipid odors injurious to industry. Toxic Substances: No conditions injurious to public health.
Pennsylvania	6.0-9.0	—	93*	2*/hr.	3.0 (daily average)	Color, Taste and Odor: No wastes that produce odors, taste or odors in amounts harmful to industrial use. Solids: Suspended solids must not exceed 750 mg/l monthly average; 150 mg/l. No floating wastes or substances that settle or form sludge in amounts harmful to industrial use. Toxic Substances: None in amounts harmful to industrial use.
Rhode Island	6.0-8.5	—	—	4*	3.0* (16 hrs./day)	Radioactivity: Toxic Substances: No concentrations or combinations harmful to human, animal or aquatic life. Taste and Odor: None in concentrations that would impair industrial use. Solids: No solid refuse, floating solids or sludge deposits.
South Carolina	6.0-8.5 (swamps)	—	95.2*	10*	3.0* (2.5* (swamps))	Turbidity, Color, Taste and Odor: Free from wastes that produce the existing turbidity or color or that produce taste or odor to such a degree as to cause a nuisance or interfere with industrial use. Solids: None from waste sources in amounts that are slightly putrescent, odorous or that cause a nuisance or interfere with industrial use. Toxic Substances: Free from wastes harmful to human, animal, plant or aquatic life or that interfere directly or indirectly with industrial use.
South Dakota	6.0-9.5	1.0	—	—	—	Radioactivity: None permitted in water unless readily soluble or dispersible and in quantities and by contact or direct ingestion. Color, Taste and Odor: No wastes that produce industrial discoloration or undesirable odors. Solids: Suspended solids must not exceed 2,000 mg/l. No wastes producing floating solids, sludge deposits or other offensive effects. Toxic Substances: None in concentrations toxic to human, animal or aquatic life.
Tennessee	6.0-9.0	1.0 (24 hrs.)	93*	10* (3*/hr.)	Enough to prevent offensive conditions	Radioactivity: None that could adversely affect industrial use. Turbidity, Color: None in amounts or concentrations that could not be reduced to acceptable levels by conventional treatment. Taste and Odor: None that would result in taste or odor that would prevent use for industrial purposes. Solids: Suspended solids must not exceed 1,000 mg/l. No continuously settling or bottom deposits or sludge. No wastes that could be utilized for industrial use. Toxic Substances: None that produced conditions that would adversely affect water for industrial use.
Texas	6.0-9.0 (cooling water)	—	—	—	4.0	Radioactivity: Restricted by Texas Radiation Control Act and Texas regulations for Control of Radiation. Turbidity: None that is visually objectionable due to wastes. Color: No abnormal color contrast with natural appearance of receiving water. Wastes: Wastes receive only practical treatment. Taste and Odor: No concentrations that produce offensive odors. Solids: Suspended solids must not exceed 1,000 mg/l, unless water is used for cooling. Must be essentially free from floating or suspended solids that would severely affect industrial use. Toxic Substances: Shall not show taste or odors harmful to human, animal or aquatic life to such an extent as to interfere with industrial use.

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Water quality standards

State	pH Allowable Temperature (°F) allowable			Dissolved oxygen (mg/l, or %)	Other Requirements
	Range	Deviation	Maximum	Interim Subminimum	
Utah 6.5-9.0	—	—	—	—	And activity: Shall not exceed 1/20 of BOD values for continuous occupational operations in BOD Handbook 60. Turbidity: None in amounts that interfere with existing use or color change to create a nuisance or interference with industrial use. Taste and Odor: No wastes in amounts that produce taste or odor. Solids: No floating wastes that are unsightly or that interfere with industrial use. No wastes that settle to form unsightly or odorous sludge or bottom deposits. Toxic Substances: No wastes in concentrations or combinations toxic to human, animal, plant or aquatic life or that would interfere with industrial use.
Vermont 6.0-8.5	—	—	4°	3.0° 5.0° (15 hrs./day)	Radioactivity: To be approved by appropriate state agency. Turbidity, Color, Taste and Odor: None in concentrations that would impair industrial use. Solids: No floating wastes, sludge deposits or sand refuse. Toxic Substances: No chemical concentrations or combinations harmful to human, animal or aquatic life.
Virginia 5.0-9.0 (Maximum allowed 9.3)	—	0.6° (unless naturally higher)	No sudden changes that could harm aquatic life	1.0° 2.0° (daily average)	Color, Taste and Odor: No wastes that change existing color or produce odor to such a degree as to create a nuisance or interfere with industrial use. Solids: No floating wastes that are unsightly or create a nuisance or other wastes that settle to form unsightly, persistent or odorous deposits. Toxic Substances: No wastes in concentrations or combinations that would interfere directly or indirectly with industrial use.
Washington 6.5-9.5	0.5	70°	1-150° (7-15)	6.5 or 70°	Radioactivity, Toxic Substances: Below concentrations that could adversely affect industrial use. Turbidity: Less than 10 JCU over natural conditions. Color, Taste and Odor: Solids: Dissolved, suspended, floating or submerged matter shall not create odorous values so as to affect industrial use.
West Virginia Process water 5.5-9.0 (Maximum 9.3)	—	Cooling water: 70° (daily, day) 75° (Oct.) 75° (Dec.) Process water must permit fish passage	5° Daily: 25 hr. (Oct./Nov.)	1.0 2.0 (daily average)	Color: None that is objectionable. Taste and Odor: No objectionable odor in vicinity of the water. Solids: No objectionable floating, suspended or submerged waste of undesirable kind or quantity. No objectionable bottom deposits or sludge. Toxic Substances: No concentrations of materials poisonous to human, animal or fish life.
Wisconsin 6.0-9.0	0.5	65°	—	1.0 2.0 (daily average)	Color, Taste and Odor: No materials producing color, taste or odor in amounts that would create a nuisance. Solids: Dissolved solids must not exceed 100 mg/l (100 mg/l as CaCO ₃ max.). No floating or submerged waste of undesirable kind or quantity that would create objectionable deposits in amounts that create a nuisance. Toxic Substances: None in concentrations or combinations toxic to humans or of public health significance.
Wyoming 6.5-9.5	—	—	4° (for streams where temp. not over 70°)	6.0	Radioactivity: Not to exceed 1/20 of BOD Handbook 60 values. Turbidity: No more than 15 JCU above natural (above 100 mg/l in 10 JCU or less) otherwise, no more than 100 mg/l. Color: Essentially free of wastes that visibly and adversely affect water or impart color to vessels or structures. Taste and Odor: Essentially free from substances that would produce objectionable odor at site of use. Solids: Essentially free from floating or settleable solids that are unsightly or settle to form sludge, silt or bottom deposits. Toxic Substances: Free from all substances in concentrations or combinations toxic to human, animal or aquatic life.

* Standards received from Federal Water Pollution Control Administration approval.

§ 10. The discharges must be in a stream from natural waste sources, at any point throughout the given stream reach. The discharge must be in a stream that is a natural stream reach.

§ 11. The discharge must be in a stream that is a natural stream reach. The discharge must be in a stream that is a natural stream reach. The discharge must be in a stream that is a natural stream reach.

§ 12. The discharge must be in a stream that is a natural stream reach. The discharge must be in a stream that is a natural stream reach. The discharge must be in a stream that is a natural stream reach.

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