A Description of Different Water Quality Conditions, the Possible Associated Problems and the Possible Causes

PHYSICAL CONDITIONS OBSERVED	POSSIBLE ASSOCIATED PROBLEMS	POSSIBLE ASSOCIATED CAUSES
WATER APPEARANCE		
Green, Green-Blue, Brown or Red	Indicates the growth of algae	High levels of nutrient pollution, originating from organic wastes, fertilizers, or untreated sewage
Muddy, Cloudy	Indicates elevated levels of suspended sediments, giving the water a muddy or cloudy appearance	Erosion is the most common source of high levels of suspended solids in water Land use that cause soil erosion include mining, farming, construction, and unpaved roads
Dark Reds, Purple, Blues, Blacks	May indicate organic dye pollution	Originated from clothing manufacturers or textile mills
Orange-Red	May indicate the presence of copper	Copper can be both a pollutant and naturally occurring Unnatural occurrences can result by acid mine drainage or oil-well runoff
Blue	May indicate the presence of copper, which can cause skin irritations and death of fish	Copper is sometimes used as a pesticide, in which case an acrid (sharp) odor might also be present
Foam	May indicate presence of soap or detergent	Excessive foam is usually the result of soap and detergent pollution Moderate levels of foam can also result from decaying algae, which indicates nutrient pollution
Multi-Colored (oily sheen)	Indicates the presence of oil or gasoline floating on the surface of the water. Oil and gasoline can cause poisoning, internal burning of the gastrointestinal tract and stomach ulcers	Oil and gasoline pollution can be caused by oil drilling and mining practices, leaks in fuel lines and underground storage tanks, automotive junk yards, nearby service stations, wastes from ships, or runoff from impervious roads and parking lot surfaces
No Unusual Color	Not necessarily an indicator of clean water	Many pesticides, herbicides, chemicals, and other pollutants are colorless or produce no visible signs of contamination
ODOURS		
Sulfur (rotten eggs)	May indicate the presence of organic pollution	Possible domestic or industrial wastes
Musty	May indicate presence of organic pollution	Possible sewage discharge, livestock waste, decaying algae, or decomposition of other organic pollution
Harsh	May indicate presence of chemicals	Possible industrial or pesticide pollution
Chlorine	May indicate the presence of over-chlorinated effluent	Sewage treatment plant or a chemical industry
No Unusual Smell	Not necessarily an indicator of clean water	Many pesticides and herbicides from agricultural and forestry runoff are colorless and odorless, as are many chemicals discharged by industry
EROSION	Sediment and suspended solids	Land uses that cause soil erosion include mining, farming, construction, unpaved roads, and deforestation
DUMPING	Decomposition of organic material or human made products, presence of chemical or metal pollutants in water, presence of oil or gasoline in water	Construction, urbanization
DISCHARGE PIPES	Organic wastes, detergents, chemical/industrial runoff, sewage, temperature increase in body of water	Improper industrial waste treatment, improper sewage or gray water treatment

The information contained in this document comes from the following website: http://www.in.gov/dnr/soilcons/riverwatch/pdf/manual/Chapters6-7.pdf

WATER QUALITY CONDITIONS OBSERVED	POSSIBLE ASSOCIATED PROBLEMS	POSSIBLE ASSOCIATED CAUSES
DECREASE IN DISSOLVED OXYGEN	Temperature increase Organic waste – once part of a living plant or animal (food, leaves, feces, etc.)	Reduction in vegetation shading body of water; increase in sediment or suspended solids; industrial cooling processes Leaking or failing septic systems; waste from farms and animals (pets and feedlots); discharge from food-processing plants, meat-packing houses, dairies, and other industrial sources; garbage; industrial waste (organic fibers from textile, paper, and plant processing); sewage treatment plants, natural processes; grass, tree, and shrub clippings; urban runoff; agricultural runoff Golf courses; residential lawns; agricultural lands; recreational parks Litter washed into sewer systems Multiple sources of water pollution (e.g., chemicals, toxins) Climatic or weather change
FECAL COLIFORM BACTERIA *E. COLI* ENTEROCOCCI	Organic waste – feces from human beings or other warm-blooded animals	Leaking or failing septic systems; failing sewer systems Direct discharge from mammals and birds with access to waterways or waste entering a body of water as runoff
INCREASE IN TEMPERATURE (THERMAL POLLUTION)	Organic waste – once part of a living plant or animal (food, leaves, feces, etc.) Reduction in vegetation shading body of water Industry and power plant discharge Runoff from warmed urban surfaces Suspended solids Flow of water impeded	Natural processes; grass clippings; tree and shrub clippings; unnatural fish or animal kills Shade trees and shrubs removed from stream bank for urban development, irrigation, and industrial and agricultural expansion, exposing the water to direct sunlight Water returned to source is at higher temperature than at initial intake point Impervious land cover such as paved streets, sidewalks, and parking lots Urbanization leading to increased numbers of buildings, homes, and roads on lands, that previously were natural areas and absorbed rain and snowmelt more efficiently Removal of streamside vegetation; overgrazing; poor farming practices and construction causing excessive soil erosion Dams, dikes, and diversions for agricultural, industrial, or municipal practices decrease flow rate of river, absorbing more heat from sunlight Dams created from beavers or log jams
TURBIDITY HIGH TOTAL DISSOLVED SOLIDS/TOTAL SOLIDS	Suspended solids (ranging from clay, silt, and plankton, to industrial wastes and sewage)	Erosion from agricultural fields; construction sites; residential driveways, roads, and lawns; natural and accelerated erosion of stream bank; excessive alga growth Leaves and plant materials Wastewater treatment plant Runoff from urban areas Dredging waterways Waste discharge (garbage, sewage) Excessive population of bottom-feeding fish (such as carp) that stir up bottom sediments

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EXCESSIVE PHOSPHATES	Human wastes Organic waste – once part of a living plant or animal (food, leaves, feces, etc.) Runoff from fertilized land Industrial waste Detergents Natural events	Leaking or failing septic systems; sewage treatment plants Waste containers leaking; lack of waste storage facilities; animals have direct access to waterways Pet wastes not collected and disposed of appropriately Removal of natural vegetation for farming or construction practices, causing soil erosion Draining swamps and marshes for farmland or commercial/residential development Drained wetlands no longer functioning as filters of silt and phosphorous Agricultural fields; residential lawns; home gardens; golf courses; recreation parks Poorly treated sewage; broken pipes; farms; golf courses; sewage treatment facilities; industrial discharges Household and commercial cleaning agents washing into water and sewage systems Forest fires and fallout from volcanic eruptions
EXCESSIVE NITRATE	Runoff from fertilized land Human wastes Animals wastes Organic waste – once part of a living plant or animal (food, leaves, feces, etc.)	Agricultural fields; residential lawns; gold courses; recreational parks Leaking or failing septic systems; sewage treatment facilities Waste containers leaking; lack of waste storage facilities; animals (particularly ducks and geese) that have direct access to waterways Pet wastes not collected and disposed of appropriately Natural processes; grass clippings; tree and shrub clippings; unnatural fish or animal kills
PH	Vehicles for transportation Industrial waste Runoff from fertilized land	Improper engine maintenance of vehicles (emissions systems) Industrial or mining drainage; sewage treatment plants Agricultural fields; residential lawns; golf courses; recreational parks
PH & ALKALINITY	Acid rain (beginning in neighboring regions)	Excessive air pollution from burning fossil fuels for automobiles, boats, planes, etc.
SALINITY	Salt and oil runoff Bodies of salt water mixing with fresh water	Paved roads cannot absorb substances, such as salts used on roads in winter; irrigation water picks up salts in soil Water tables decrease in areas where water is being pumped (used) at levels exceeding replenishment capability
HIGH CONDUCTIVITY	Discharges into the water	Failing sewage systems High temperature Water used for irrigation Discharge of heavy metals into the water
LOW CONDUCTIVITY	Discharges into the water	Oil Spill Low temperature

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RURAL OBSERVATIONS	POSSIBLE ASSOCIATED PROBLEMS	POSSIBLE ASSOCIATED CAUSES
AGRICULTURAL		
Crop Production	Chemical runoff = pesticides, herbicides, insecticides Temperature increase in body of water adjacent to agricultural fields Natural flow of water impeded Reduced ability to contain suspended solids, chemicals, and excess water from runoff	Poor farming practices causing excessive erosion of sediment and chemicals from fields Shade trees and shrubs removed from stream bank for irrigation or agricultural expansion, exposing the water to direct sunlight Dams, dikes, and diversions from agricultural practices decrease flow rate of water, absorbing more heat from sunlight Draining swamps and marshes for farmland
Manure Piles	Organic waste entering water from runoff	Improper containment of farm animal waste
Animal Grazing	Organic waste entering water from runoff	Direct discharge from farm animals with access to waterways or waste entering a body of water as runoff
RESIDENTIAL		
Housing	Excess water and chemical runoff, runoff from fertilized and impervious land Reduction in vegetation shading body of water	Urbanization leads to increasing numbers of buildings, homes, and roads on lands that previously were natural areas, runoff from driveways and lawns Shade trees and shrubs removed from watershed for housing development, exposing the water to direct sunlight and increasing sediment and suspended solids entering a body of water from erosion
Septic Systems and Gray Water Fields	Human wastes and/or gray water leaking into groundwater Detergents	Leaking or failing septic systems Household cleaning agents washing into water and sewage systems
Dumping	Trash Organic waste – once part of a living plant or animal (food, leaves, feces, etc.)	Litter washed into sewer systems Pet wastes not collected and disposed of properly Grass, tree, and shrub clippings washed into sewer systems
SCHOOL	Runoff from fertilized and impervious land Trash	Impervious land cover such as sidewalks, play grounds and parking lots causes excessive runoff Liter washed into adjacent waterways or sewer systems
COMMERCIAL/INDUSTRIAL	Reduction in vegetation shading body of water Organic waste Runoff from fertilized or impervious land Industry and power plant discharge	Shade trees and shrubs removed from watershed for commercial/industrial development, exposing the water to direct sunlight and increasing sediment and suspended solids entering a body of water Wastewater treatment plants Discharge from food-processing plants, meat-packing houses, dairies, and other industrial sources Organic waste from fibers originating from textile and plant processing plants Impervious land cover such as parking lots and sidewalks causes excessive runoff Industrial cooling process; water returned to source body of water is at higher temperature than at initial intake point Industrial or mining drainage

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CONSTRUSTION		
Buildings and Roadways	Sediment and suspended solids Temperature Increase	Construction of new buildings, homes, and streets causes excessive erosion Paved road cannot absorb chemicals, soil, and suspended particles in runoff Draining swamps and marshes for commercial or residential development reduces water catchment ability and filtering of silt and suspended solids Dredging waterways Dams, dikes, and diversions for drinking water intake decreases flow rate of water, absorbing more heat from sunlight
PUBLIC USE		
Zoo	Organic waste	Direct discharge from mammals and birds as waste entering a body of water as runoff
Parks and Golf Courses	Runoff from fertilized and impervious land	Chemical runoff from golf courses and recreational parks entering a body of water as runoff Impervious land cover such as parking lots causes excessive runoff
Airports, Bus Stations, Train Stations	Runoff from impervious land	Impervious land cover such as parking lots causes excessive runoff
Marina or Shipping Port	Petroleum Products	Chemical pollutants from point or nonpoint source pollution