Table 1

Indicator Test	Water Quality Data	Interpretation	Possible Source	Explanation	Impact of fish
Ammonia	Ammonia levels above .25 ppm	Ammonia level too high for trout and other salmonids to survive more than a month.	Agriculture: Fertilizer. Animal waste (usually from farms, pastures, or feedlots). Residential: Household use of ammonia-containing cleaning products, leaking home septic systems, and improper disposal of ammonia products. You: Pet waste	Fertilizer contains high levels of nitrogen and other nutrients to boost plant growth. When too much fertilizer is applied or if it's applied before a rain, the nutrients get washed into storm drains and into our waterway, boosting plant growth in the wrong place. Animal waste has a high amount of ammonia. Ammonia is a source of nitrogen and therefore a nutrient that plants need for growth. Increased ammonia from animal waste leads to more plants in waterways. The new plants use up oxygen for respiration. Fish die because there isn't enough oxygen in the water. Improperly disposed of ammonia cleaning products do the same thing when it enters the waterway.	Too much ammonia is harmful to fish in two ways. 1. Ammonia in the water prevents fish from breathing correctly, eventually leading to death. 2. Ammonia is a nutrient found in nature that helps plants grow. When there is too much ammonia in the water, too many plants grow. These extra plants use up the oxygen that fish need to survive. Ammonia can block oxygen transfer in the gills of fish, causing immediate and long term gill damage. Fish suffering from ammonia poisoning will appear sluggish and come to the surface, as if gasping for air. Fish exposed to ammonia levels above .25 ppm for a month will die. Fish exposed to ammonia levels above 1 ppm will die in 1-3 days.
Nitrates	Nitrates levels greater than 5 ppm.	Nitrate level too high for fish to survive in freshwater.	Agriculture: Fertilizer. Animal waste (usually from farms, pastures, or feedlots). Residential: Leaking home septic systems. Fertilizer from lawn or gardens. You - nitric acid (produced by automobile engines).	Fertilizer contains high levels of nitrogen and other nutrients to boost plant growth. When too much fertilizer is applied or if it's applied before a rain, the nutrients get washed into storm drains and into our waterway, boosting plant growth in the wrong place. Animal waste has a high amount of nitrate. Nitrate is a source of nitrogen and therefore a nutrient that plants need for growth. Increased nitrogen from animal waste leads to more plants in waterways. The new plants use up oxygen for respiration. Fish die because there isn't enough oxygen in the water. Nitric acid from vehicles exhaust falls as acid rain and adds significant nitrates to waterways. All this means more plants than normal.	Excess plants in a body of water can create many problems. Too many plants and algae create an unstable amount of dissolved oxygen. During the day, there will be usually be high levels of dissolved oxygen, and at night the levels of oxygen can decrease dramatically. This will create stressful conditions for fish. If they are stressed for a significant part of the day, they will not behave normally or reproduce. If the conditions persist for a long period of time, the stressed fish species may choose to leave that area or die off. Fish that need gravel or sand for spawning may find nothing but mats of vegetation and muck so will be unable to produce offspring.
Phosphate	Phosphate levels greater than 1 ppm.	Phosphate level too high. Algae bloom likely	Agriculture: Fertilizer. Animal waste (usually from farms, pastures, or feedlots). Residential: Leaking home septic systems. Municipality: Overloaded sewage treatment plants. You: Pet waste and laundry detergent.	Phosphates are a nutrient that boost plant growth, much like nitrogen. Phosphates are especially high in animal and human waste. Too much phosphate entering the waterway lead to plant and algae blooms, stealing oxygen that fish need to survive.	Excess phosphate in the waterway does not directly harm fish. But, excess phosphate will allow plants and algae to grow more than they should in the waterway. Too many plants and algae use up too much oxygen. Fish are left with too little oxygen to breathe and eventually die.
D.O. (Dissolved Oxygen)	Dissolved Oxygen levels below 5 (ppm)	Oxygen below level necessary for fish to survive.	Agriculture: Fertilizer. Excess animal waste (usually from barnyards, pastures, ranch lands, or feedlots). Residential: Excess leaves, soil, and other organic matter entering stormwater drains. Leaking or overfilled home septic systems. Municipality: Overloaded sewage treatment plants.	If animal or human waste enters a waterway, the number of bacteria in that waterway increase to break down the waste. The bacteria needed to break down (decompose) any organic material requires oxygen. When too much vegetation, algae, or animal waste ends up in the water, fish die because there isn't enough oxygen left for them to breathe.	Oxygen is required by all living things. Fish absorb oxygen through their gills, where the bloodstream moves it to muscles and organs. When oxygen levels in water become dangerously low, fish rise the surface of the water, where oxygen levels are highest. If dissolved oxygen is not added, fish will die. Low oxygen levels kill fish by suffocation.
Turbidity vs. Clarity	Water is cloudy, murky and hard to see through	Turbidity is higher than healthy levels.	Residential - Exposed soil from construction sites. Fertilizer from lawn or garden. Agriculture - Exposed soil from tilling and planting crops Fertilizer from crop fields	Loose soils from construction sites or bare fields are more prone to erosion during storms. When stormwater runoff deposits these sediments into ponds, streams or wetlands, they can make turbidity much worse than it would be normally. When too much fertilizer is applied or if it's applied before a rain, the nutrients get washed into storm drains and into our waterway, boosting algae growth. Algae can take over a waterway, causing the water to become green, brown, white, yellow, or red.	Turbid water makes it difficult for predators to hunt because they cannot see their prey. Turbid water also prevents sunlight from reaching plants at the bottom of the body of water. Plants cannot produce oxygen without sunlight. Fish suffocate in very turbid waters. The silt and dirt that cause turbidity can settle on the bottom and cover fish and insect eggs. The eggs suffocate and die when covered with silt or dirt.
pH	pH outside healthy range of 6.0-8.0	Water is too acidic or basic for fish to survive.	Industry - sulfuric acid (made by coal burning industries) and You - nitric acid (produced by automobile engines) are main contributors to acid rain. Factories - Dumping industrial pollutants directly into the waterway can impact pH (oil, toxic chemicals, heavy metals). Mining - Stripping away vegetation and soil exposes new rock to falling rain.	Coal burning factories release sulfuric acid into the air. Vehicle engines release nitric acid into the air. Both of these acids cling to water in the clouds and fall back to the earth as rain. Acid rain greatly lowers the pH of waterways. If mining activities expose limestone or other alkaline substances, runoff from rainfall may increase pH in local waterways.	Low pH from Acid Rain can release toxic metals into the water causing fish gills to clog, leading to suffocation. Acidic water can also prevent many fish from laying eggs successfully, and weakens bones in adult fish. Acid water will also dissolve the shells of crayfish, snails and other invertebrates that fish depend on for their food.