**Water Quality Parameters**

**Water Quality Monitoring** is the process of sampling the lake water at regular intervals throughout the year to determine current lake water conditions.  This process can show trends in water quality over time and is critical in identifying potential threats to the aquatic ecosystem and provides information in which to make rational decisions on preventative actions.

Individual parameters are compared to a standard objective, which is the Saskatchewan Surface Water Quality Objectives.  These objectives are based on the intended use of the water such as: protection of aquatic life, irrigation, recreation or livestock watering.

The **key parameters** that are monitored are: Dissolved Oxygen, Total Phosphorous, Nitrogen, Total Dissolved Solids, Turbidity, Heavy Metals, Algal Blooms and Fecal Coliforms.  Below is a short description of each of these parameters

**Dissolved Oxygen:** All aquatic organisms such as fish, invertebrates, plants and aerobic bacteria require oxygen to live.  The objectives set dissolved oxygen levels at 5mg/L for the protection of fish and aquatic life. Levels below 3mg/L can be stressful to aquatic life.  Levels below 1mg/L are considered to be anoxic or no oxygen present.

**Total Phosphorous:**  Phosphorous an element that occurs naturally in the environment is an essential nutrient for plant and animal growth.  It enters water bodies as a result of surface run-off, soil erosion, decay of organic matter and waste.  High phosphorus level can stimulate algal and weed growth at levels greater than 0.1 mg/L.

**Nitrogen:** Nitrogen occurs in several forms in water: ammonia, nitrate, and organically bound.  It is an important plant nutrient.  Ammonia nitrogen is used as an indicator of the quality of the water for aquatic life, however high ammonia concentrations can be toxic to fish.  Nitrate levels are typically less that 1mg/L in healthy surface water systems.

**Total Dissolved Solids:** Total Dissolved Solids (TDS) is a measure of the amount of dissolved solids in the water.  These are solids such as: bicarbonate, sulphate, chloride, calcium, magnesium, sodium and potassium.  Concentrations of TDS depend on, the amount of precipitation a water body receives, The type of earth and rock the waters passes over and human activities. Turtle Lake TDS levels range between 576 - 750 mg/L.

**Turbidity:** Turbidity indicates the amount of suspended material in water such as soil particles, algae, or other microscopic organisms.  High turbidity reduces light penetration, productivity and habitat quality.  Suspended sediment can carry nutrients, metals and pesticides.  Turbidity is measured by placing a Secchi Disk into the water and determining how far it can be lowered before it is no longer visible.

**Heavy Metals:** Heavy Metals can be toxic to the aquatic environment at elevated levels.  Some metals such as mercury can bi-accumulate, creating higher levels of concentration as they move along the food chain.  Heavy metals do occur naturally in the environment and enter water bodies as the result of surface run-off, soil erosion, or improper waste disposal.  High levels can restrict water use.

**Algal Blooms:** Algal Blooms are common in nutrient rich surface waters.  The main types of Algal Blooms are: Green algae, diatoms, and blue-green algae (cyanobacteria). Green Algae and Diatoms are more nuisance organisms.  The plug irrigation and water treatment equipment, affect recreation activities, and can produce taste and odor compounds. Blue-Green Algae produce organisims that produce neuro and hepato-toxins.  Turtle Lake rarely experiences algal blooms in the open-water areas.

**Fecal Coliforms:** Fecal Coliform counts are used as an indicator of the sanitary quality of water.  These bacteria are found in the intestinal tract of warm-blooded animals, including humans.  A high fecal coliform count indicates water contamination.  For recreational use of a water body, levels should not exceed an average density of 200 organisms per 100 mL.   Fecal Coliforms must be absent entirely from drinking water so lake water should be boiled or treated before drinking or using it to prepare food.