

## Understanding the Dip Results

Thank you for being a part of the water quality campaign to Take the Dip! The Take the Dip kits are FREE to anyone who would like to participate and we are encouraging that these are used in Surrey.

**If you have any questions or need more kits please contact Liana Ayach at 604-591-4383 or [salmontracks@surrey.ca](mailto:salmontracks@surrey.ca)**



## Understanding the Dip

People will be using the plastic jars to collect a water sample from a stream or creek. Your dip will give us information in 6 different water quality measures that are all important to maintaining the healthy ecosystem habitats. Once they have completed their tests, the results are recorded on the Dip postcard and returned with the kit supplies.

Provincial water quality guidelines can be found at [www.env.gov.bc.ca/wat/wq/wq\\_guidelines.html](http://www.env.gov.bc.ca/wat/wq/wq_guidelines.html)

**TURBIDITY:** Turbidity is a measurement of how clear, or opaque, the water is. Turbid water is when there are higher levels of suspended soil, clay, silt, organic/inorganic matter and microscopic organisms in the water. Turbid water is different than darkly coloured water as darkly coloured water can still be clear. High levels of turbidity in Surrey's streams could indicate a greater amount of soil entering a storm drain somewhere and could be caused by a construction site nearby. Higher levels of turbidity in streams also occur during rain events. Generally in urban streams, the lower the turbidity the better the water quality for aquatic species. If a value of over 60 NTU over the background level is recorded in a stream sample where a pollution source can be identified then it triggers further investigation with sample collection for analysis at a lab facility to determine the amount of suspended solids in the water.



Turbidity values are commonly recorded as NTU or JTU units. NTU (Nephelometric Turbidity Units) indicate that a calibration using a standard liquid in a turbidity meter was used to measure the amount of light the sample refracted. JTU (Jackson Turbidity Units) is the more historic unit when measurements were made using a Jackson Candle Turbidimeter measuring the point when a candle flame positioned under a tube of water could no longer be visible as water was added to the tube. Measurements in the Take

the Dip kits record measurements as JTU units as a visual determination is used for when the checked circle inside (this is a 'secchi disk' tool) is no longer visible.

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**TEMPERATURE:** Salmon, trout and other aquatic species are very sensitive to temperature changes in the water and the temperature must stay within a certain range for them to be able to survive. Temperature also affects other things in an aquatic habitat as well, such as the amount of dissolved oxygen the water can hold (the warmer the water the less dissolved oxygen).

The preferable temperature range for Pacific Northwestern streams is 4 to 18 degrees Celcius. Water quality protection also looks at the rate at which temperature changes in a stream.

**NUTRIENTS (Nitrate/Nitrite):** Nutrients are common chemicals found in products that make things grow (like fertilizers) or wastes (like sewer discharges and animal waste). If there are too many nutrients in a waterway it can cause too much growth of algae that will then die off when the nutrients are used up. When this plant material decays it can cause higher turbidity, lower the dissolved oxygen in the water and cause bad smells.

Nitrate and nitrite can also be directly toxic to fish populations as they may affect the ability of the organism to utilize the dissolved oxygen in the water. The B.C. guidelines to protect freshwater aquatic life is 3.0 mg/L for nitrate and 0.06 mg/L for nitrite.

**pH:** pH is a measurement of how acidic or basic the water is. The range for pH is 0 for very acidic to 14 for very basic, with a pH of 7 being neutral. Most aquatic species thrive in water that has a pH range between 6.5 to 8. Should the pH values vary outside of this range or change quickly from one end of the scale to the other, it can cause stress to the aquatic species in the water. In areas with air pollution concerns, the rainwater may become more acidic as the rain

encounters atmospheric gases as it falls to the ground. The rainwater becomes weak sulphuric and nitric acids as the rain absorbs concentrations of sulphur and nitrogen oxides and can bring the pH level down to 4.

**DISSOLVED OXYGEN:** All aquatic species need dissolved oxygen (DO) to live. It is measured either as parts per million (ppm) or an equivalent unit of milligrams per litre (mg/L). The streams and creeks with consistently high levels of DO support a wide diversity of life. There are many factors that can affect the level of DO in a waterway with some of these factors being natural and some not. A natural factor that can lower the DO in a stream is temperature – the higher the temperature of the water, the less DO the water can hold. For example, water at 28 degrees Celsius can hold 8 ppm of DO and water at 8 degrees Celsius can hold 12 ppm of DO. Some other factors that can affect the amount of DO in the water are nutrient levels and organic matter as when these breakdown in waterways it can consume dissolved oxygen in the water leaving less available for aquatic species. To maintain aquatic life in all the life cycle stages of a fish the dissolved oxygen levels should be higher than 5 mg/L.

