

Turbidity is a measurement of how "cloudy" water is resulting from suspended solids (clay, silt, organic matter, and microscopic organisms, etc). Suspended solids can contain harmful chemicals and parasites such as bacteria and viruses, which makes turbidity a good indicator of water quality. A turbidity meter is the best way to get true turbidity measurements, but there are other methods such as using secchi disks, transparency tubes, and visual comparison kits to get a "visual transparency" measurement, which is closely associated with turbidity. The only problem with using different methods is that each method has its own unit of measure and there is no direct conversion factor.

### Secchi Disks

Secchi disks are commonly used to measure visual water transparency in lakes, rivers, streams and the ocean. They consist of a 20cm (8") solid disk, separated into 4 quadrants alternately colored black and white. A weight is attached to the bottom and a measuring rope is attached to a loop on the top. The secchi disk is then lowered into the water to the point where you cannot see the design anymore. The measurement markings on the rope will give you the "Secchi Depth".

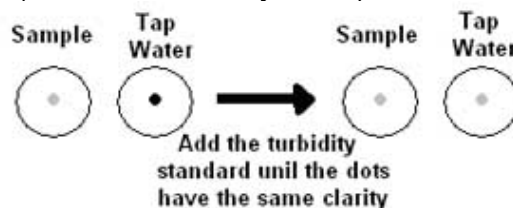


### Transparency Tubes

Transparency Tubes are very similar to secchi disks. They have the same secchi disk pattern in the bottom of the tube. The tube is filled with water until you can no longer see the secchi pattern from the top and water is slowly let out of the tube until you can see the pattern. The markings on the outside of the will give you a water level, which is a "Transparency Tube" measurement.

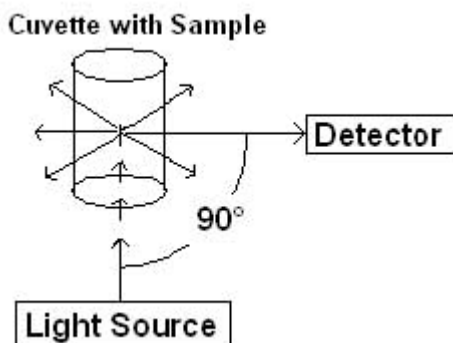


**Visual Comparison Kits** - Visual comparison kits are similar to transparency tubes but they use a known turbidity standard solutions for visual comparison. They typically contain two tubes with a black dot in the bottom. The first tube is filled up with your sample and the second tube is filled with distilled or tap water. A set amount of the turbidity standard solution is continually added to the distilled/tap water tube until the dots at the bottom of both tubes have the same clarity. The amount of the turbidity standard is measured and converted into a turbidity measurement, typically in JTU (Jackson Turbidity Units).



## Turbidity Meters

Turbidity meters are commonly used in public drinking water systems, wastewater treatment systems, and environmental monitoring. They use a concentrated light source that is aimed at a sample. The intensity of the scattered light 90° from the light source is measured and then converted into either NTU (nephelometric units) or FNU (formazin nephelometric units). The difference between meters that measure in NTU and meters that measure in FNU is the light source. NTU is measured from a tungsten halogen lamp while FNU is measured from an infrared LED (light emitting diode). EPA standards, which are used for US and Canadian drinking water, require NTU while ISO standards, used throughout Europe and other parts of the world, require FNU. These units can be very closely related to each other, but there is no direct conversion because they are derived from different methods (light sources) to get a measurement.



For information on calibration, storage and maintenance of pH probes, see the [Calibration and Maintenance of Water Quality Meters Tech Info Doc](#).

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