# TOXICITY TEST FACT SHEET #3
– Freshwater & Marine

Chronic Toxicity Test With Algae

The chronic toxicity test using the micro alga measures the effect of test materials on growth over a 72 hour period. The test can be run using the freshwater green algae Selenastrum capricornutum, the marine diatom Nitzschia closterium or the marine flagellate Isochrysis aff. Galbana
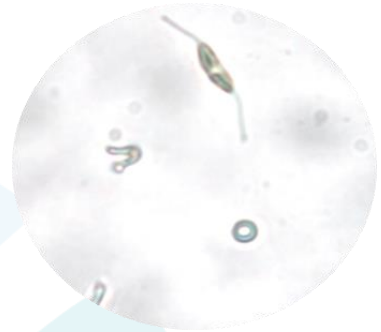
Algae are primary producers of organic matter upon which animals depend either directly or indirectly through the food chain. In Australia, the test using the freshwater S. capricornutum has been widely used in toxicity assessment of sewage treatment plant effluents discharging into freshwater streams and rivers. The tests using the marine algae have been widely used along side invertebrate toxicity tests.

In summary, this test involves exposing laboratory cultured algae to the test material for 72 hours. The test is usually undertaken on a range of concentrations of a test material, eg 100, 50, 25, 12.5 and 6.3% effluent. At the end of the exposure period, algae cell yield is determined.

Statistical analyses are then applied to the test data to determine for example, the concentration of the test material causing 50% inhibition in algal cell yield in the test population (IC50 estimate). The test data can then be used to estimate concentrations of the test material likely to cause chronic toxicity in the environment.

The algae growth test may be used to assess the toxicity of:
▸ Chemicals
▸ Effluents
▸ Leachates and groundwater
▸ Sediments

If toxicity is detected using the chronic algae test, a Toxicity Identification Evaluation (TIE) programme can be initiated to identify the cause of the observed toxicity.

Chronic Toxicity Test With Micro Algae	
Test type	Chronic static
Test end-point	Cell yield
Test duration	72 hours
Test Temperature	18 ± 1°C or 25 ± 1°C
Sample volume required	1 litre for full EC50 determination
Test availability	24hrs notice requested
Test turnaround time	Advised within 72 hours of test initiation