

## ANALYTICAL CHEMISTRY AND MICROBIOLOGY SERVICES

<p><u>Analytical Chemistry Laboratory</u></p> <ul style="list-style-type: none"> <li>- Nutritional Labeling Analyses</li> <li>- Oil &amp; Fat Analyses</li> <li>- Pharmaceutical Analyses</li> <li>- Potable Water Testing</li> <li>- Wastewater Monitoring</li> <li>- Environmental Toxicology</li> <li>- Construction Sample Testing</li> </ul>	<p><u>Microbiology Laboratory</u></p> <ul style="list-style-type: none"> <li>- Food Analyses</li> <li>- Potable Water Testing</li> <li>- Wastewater Testing</li> <li>- Efficacy Testing</li> <li>- Biodegradability</li> <li>- Indoor Air Quality (IAQ)</li> </ul>
<p><u>Nutritional Labeling Analyses :</u></p> <ul style="list-style-type: none"> <li>• protein</li> <li>• fat</li> <li>• carbohydrate</li> <li>• sugars</li> <li>• dietary fiber</li> <li>• saturated / unsaturated fats</li> <li>• calories</li> <li>• minerals</li> <li>• vitamins (A,C)</li> <li>• cholesterol</li> <li>• preservatives</li> </ul>	<p><u>Oil &amp; Fat Analyses</u></p> <ul style="list-style-type: none"> <li>• peroxide value</li> <li>• iodine value</li> <li>• free fatty acid value</li> <li>• saponification value</li> <li>• specific gravity</li> <li>• refractive index</li> <li>• moisture</li> <li>• fatty acid profiling</li> </ul>
<p><u>Pharmaceutical analyses:</u></p> <p>Active ingredients in a wide range of formulations are analysed:</p> <p>Examples of samples analysed are:</p> <ul style="list-style-type: none"> <li>• painkillers</li> <li>• cough / cold syrups</li> <li>• multi-symptom cold tablets</li> <li>• non-drosy cold tablets</li> <li>• vapour rub ointments</li> <li>• sports balms</li> <li>• arthritis creams</li> <li>• disinfectants</li> <li>• antiseptic solutions</li> <li>• mouth wash solutions</li> <li>• oral rehydration salts</li> </ul>	<p><u>Potable Water Testing:</u></p> <p>CARIRI analyses potable water to verify compliance with a variety of international standards and guidelines. These include:</p> <ul style="list-style-type: none"> <li>• WHO Guidelines for Drinking Water Quality</li> <li>• WHO Guidelines for Drinking Water Quality Standards In Developing Countries</li> <li>• EPA Drinking Water Standards</li> <li>• Codex Alimentarius Standard for Natural Mineral Waters</li> <li>• FDA Requirements for Bottled Water</li> <li>• IBWA Model Code</li> </ul> <p>Monitoring Requirements</p> <p>Analyses are conducted for a range of organic and inorganic chemicals of health significance and of aesthetic value</p>

## Wastewater Monitoring

CARIRI analyses wastewater for 28 parameters listed under the Environment Management Agency's (EMA) Water Pollution Rules. These comprise:

- Temperature, pH, Dissolved Oxygen
- Biological Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD)
- Total Suspended Solids (TSS)
- Total Oil and Grease / Hexane Extractable Material (HEM)
- Total Petroleum Hydrocarbons (TPH)
- Ammoniacal Nitrogen as NH<sub>3</sub>-N
- Total Phosphorus (as P)
- Sulphide (as H<sub>2</sub>S)
- Residual Chlorine (as Cl<sub>2</sub>)
- Total Chromium & Hexavalent Chromium
- Dissolved Iron
- Total Nickel, Copper, Zinc, Arsenic, Cadmium, Mercury, Lead
- Total Cyanide
- Phenolic Compounds (as phenol)
- Toxicity
- Solid waste
- Faecal coliforms (analysed in our microbiology laboratory)

## Environmental Toxicology

Toxicity testing is used to assess whether potentially toxic chemicals are present in the environment.

- For liquid samples, two methods are used for toxicity testing
  - Whole Effluent toxicity testing
  - Microtox Acute toxicity testing

For solids and sludges, analysis of TCLP extracts is conducted in order to determine the potential mobility of inorganic analytes.

## Construction Sample Testing

Chemical analysis of a range of construction materials is conducted. These include:

- Soil
- Sand
- Aggregates
- Cement
- Concrete
- Water (for use in concrete)

Tests include:

- pH,
- sulphate,
- chloride,
- loss on ignition
- organic matter,
- potential reactivity,
- metal oxides,
- cement content