

Specification of Competency Standards
for the Testing, Inspection and Certification Industry
Unit of Competency

Functional Area - Testing Operations

Title	Perform environmental testing (chemical)
Code	105813L5
Range	This unit of competency (UoC) covers the abilities to carry out chemical tests on environmental samples independently in the testing laboratories and critically evaluate test results for the compliance of environmental samples against relevant regulatory limits.
Level	5
Credit	4 (For Reference Only)
Competency	<p>Performance Requirements</p> <p>1. Possess knowledge of chemical parameters for environmental testing</p> <ul style="list-style-type: none"> • Employ the principles and concepts underpinning chemical tests for environmental samples, e.g.: <ul style="list-style-type: none"> ○ water and wastewater: pH, chemical oxygen demand (COD), biochemical oxygen demand (BOD), chloride, residual chlorine, phosphorus, sulphide, cyanide, ammonia, nitrate and nitrite, oil and grease, total Kjeldahl nitrogen (TKN), water contaminants (such as volatile organic compounds (VOC), semi-VOC, heavy metals), total organic carbon (TOC), phenols, surfactants, ○ air: VOC, semi-VOC, ozone depleting chemicals (CFCs and HCFCs), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), ○ sediment: heavy metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs). • Identify test methods/standards of chemical tests for different environmental samples. • Explain the working principles and operation of equipment used for chemical tests of environmental samples. • Describe the sampling requirements and sample preparation techniques of chemical tests for environmental samples. • Specify the requirements of chemical tests for environmental samples as stipulated in test methods/standards, regulatory limits and guidelines. • Examine the calibration requirements of equipment for environmental testing. <p>2. Perform chemical tests on environmental samples</p> <ul style="list-style-type: none"> • Prepare a representative test portion of the selected environmental sample to reduce the sample complexity and eliminate matrix effects. • Apply appropriate test methods/standards and testing equipment for chemical tests on selected environmental sample. • Apply appropriate conditions to testing equipment. • Carry out routine performance check of equipment according to manufacturer's instruction and/or relevant standard. • Set up, optimise and check the calibration status of equipment for chemical tests of the environmental sample. • Carry out appropriate chemical tests for the environmental sample independently by measuring analyte responses of calibration standards, validation and quality control checks, and the sample according to the requirements of test methods/standards. • Conduct sufficient measurements to obtain accurate and reliable test data and/or observations. • Critically evaluate test results for the compliance of chemical contaminants in the environmental sample. <p>3. Exhibit professionalism</p>

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	<ul style="list-style-type: none">• Troubleshoot analytical procedures or equipment in case of any atypical observations/data/results being identified during sample analysis or performance and validation checks.• Ensure integrity and confidentiality of laboratory data and information by observing the relevant code of conduct.
Assessment Criteria	<p>The integrated outcome requirements of this UoC are the abilities to:</p> <ul style="list-style-type: none">• carry out appropriate chemical tests for selected environmental sample independently by applying appropriate conditions to the testing equipment according to the requirements of relevant test methods/standards,• record and document accurate test data by verifying equipment calibration status and validation check,• critically evaluate the compliance of chemical contaminants in the environmental sample by analysing test results against the relevant specifications of regulatory limits / test standards.
Remark	<p>Practitioners are required to have prior knowledge of the following UoCs:</p> <ul style="list-style-type: none">• Apply atomic spectrometric