

Title	Assess competence of drinking-water field analysts		
Level	6	Credits	11

Purpose	<p>People credited with this unit standard are able to describe, demonstrate, and assess the competence of a field analyst in: analysis of chlorine in water; measurement of ultraviolet transmittance (UVT) and ultraviolet intensity (UVI) in water treatment; measurement of the pH in drinking-water; measurement of turbidity in drinking-water; and calibrating the output of a continuous analyser.</p>
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Classification	Water Industry > Drinking-Water Assessment
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Available grade	Achieved
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Guidance Information

- Legislation and references relevant to this unit standard include: Health Act 1956, and subsequent amendments;
Drinking-Water Standards for New Zealand, 2005 (Revised 2008). Ministry of Health, Wellington;
 For methods for the specified determinands refer to *Standard Methods for the Examination of Water and Wastewater*, 22nd Edition, American Public Health Association (APHA), American Water Works Association (AWWA) and Water Environment Federation (WEF); Washington D.C, USA, published by APHA, 2012;
 NZS/ISO/IEC 17025: 2005, *General Requirements for the Competence of Testing and Calibration Laboratories*, available from StandardsNZ
<https://www.standards.govt.nz/>;
Ultraviolet Disinfection Guidance Manual (USEPA 2006b), United States Environmental Protection Agency, Washington.
- Definition
Field analysts – people who carry out analysis of water for process control, or for the purpose of verifying compliance of the drinking-water supply with the drinking-water standards, but who have not been accredited as analysts by International Accreditation New Zealand (IANZ).
- DPD is the common acronym for N,N-diethyl-p-phenylenediamine.

Outcomes and performance criteria

Outcome 1

Describe, demonstrate, and assess the competence of a field analyst in analysis of chlorine in water.

Performance criteria

- 1.1 Sampling and analysis of chlorine in water is described in terms of DPD and the procedures for electrometric analysis.
- 1.2 The analysis of chlorine in water is carried out in accordance with the standard methods for DPD and electrometric analysis and manufacturer's specifications.
- 1.3 The potential sources of error in sampling and analysis and the procedures for verification of precision and accuracy in the analysis of chlorine in water are identified in accordance with the requirements of NZS/ISO/IEC 17025.
- Range methods of analysis – DPD, electrometric analysis techniques.
- 1.4 The competence of a field analyst is assessed in terms of the theory, practice, and error sources of chlorine analysis, and equipment manufacturer's instructions.
- Range verbal questions, field observation.

Outcome 2

Describe, demonstrate, and assess the competence of a field analyst in measurement of ultraviolet transmittance (UVT) and ultraviolet intensity (UVI) in water treatment.

Performance criteria

- 2.1 Sampling and analysis of water is described in terms of procedures for measuring UVT.
- 2.2 UV intensity is described in terms of procedures for comparison and verification of UVI measurements.
- 2.3 The analysis of UVT and UVI in water is carried out in accordance with the standard measurement methods and electrometric analysis and manufacturer's specifications.
- 2.4 The potential sources of error in measurement and the procedures for verification of precision and accuracy in the measurement of UVT and UVI in water are identified in accordance with the requirements of the *Ultraviolet Disinfection Guidance Manual*.
- 2.5 The competence of a field analyst is assessed in terms of the theory, practice, and error sources of UV transmittance and intensity measurement, and equipment manufacturer's instructions.
- Range verbal questions, field observation.

Outcome 3

Describe, demonstrate, and assess the competence of a field analyst in measurement of the pH in drinking-water.

Performance criteria

- 3.1 The theory of the sampling and analysis of pH in water is described in relation to electrometric analysis and colorimetric techniques.
- 3.2 The measurement of pH in water is carried out in accordance with the standard methods for electrometric analysis and colorimetric techniques, and equipment manufacturer's instructions.
- 3.3 The potential sources of error in sampling and analysis, and the procedures for verification of precision and accuracy in the analysis of pH, are identified in accordance with the requirements of NZS/ISO/IEC 17025.
- Range techniques – electrometric, colorimetric, robust and sensitive electrodes, weak buffers.
- 3.4 The competence of a field analyst is assessed in terms of the theory, practice, and error sources of pH analysis, and equipment manufacturer's instructions.
- Range verbal questions, field observation.

Outcome 4

Describe, demonstrate, and assess the competence of a field analyst in measurement of turbidity of drinking-water.

Performance criteria

- 4.1 The theory of the sampling and analysis of turbidity in water is described in relation to photometric analysis techniques.
- 4.2 The measurement of turbidity in water is carried out in accordance with the standard methods for photometric analysis, and manufacturer's instructions.
- 4.3 The potential sources of error in sampling and analysis, and the procedures for verification of precision and accuracy in the analysis of turbidity, are identified in accordance with the requirements of NZS/ISO/IEC 17025.
- Range techniques – photometric, transmission, surface scatter, calibration to low levels.
- 4.4 The competence of a field analyst is assessed in terms of the theory, practice, and errors sources of analysis of turbidity, and equipment manufacturer's instructions.
- Range verbal questions, field observation.

Outcome 5

Describe, demonstrate, and assess the competence of a field analyst in calibrating the output of a continuous analyser.

Performance criteria

5.1 The procedure for calibrating the output of a continuous analyser is described in relation to chlorine, pH, and turbidity analysers.

5.2 The calibration and correction of a continuous analyser is carried out in accordance with manufacturer's specifications.

Range one of – chlorine, pH, turbidity analyser.

5.3 The potential sources of error are described, and the procedures for verification of precision and accuracy demonstrated, in the calibration of a continuous analyser.

5.4 The competence of a field analyst is assessed in terms of the theory, practice, and error sources of continuous analyser measurements, and manufacturer's instructions.

Range verbal questions, field observation.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	27 August 2001	31 December 2018
Review	2	19 September 2008	31 December 2018
Review	3	16 March 2017	31 December 2022
Review	4	28 January 2021	31 December 2022

Consent and Moderation Requirements (CMR) reference

0101

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.