



Australian Government

NWPHYD006 Measure discharge and process discharge data using a range of methods and equipment

Release: 1

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Modification History

Release 1. This is the first release of this unit of competency in the NWP National Water Training Package.

Application

This unit involves the skills and knowledge required to measure discharge and process discharge data using a range of methods and equipment.

It includes collecting data using a range of discharge measuring methods and equipment, to measure and calculate readings and to interpret and report data to clients and stakeholders.

This unit applies to hydrographers and water operators involved in the monitoring of all the elements of the water cycle and their impact on the related environment. Those undertaking this unit would work autonomously, usually with supervisory responsibilities, while performing complex tasks in a range of contexts.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Not applicable.

Competency Field

Hydrometric Monitoring

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to undertake

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.1 Identify the monitoring objective of the site and gauging

flow gauging		requirements
2 Collect depth and velocity data	1.2	Identify appropriate methods based on site conditions for measuring discharge
	1.3	Select appropriate equipment and instruments to meet site conditions
	1.4	Identify stream conditions and factors affecting gauging accuracy
	1.5	Identify hazards, assess risks and implement control measures according to workplace procedures
	2.1	Perform a pre-discharge measurement check on equipment and ensure it is working within specifications
	2.2	Prepare the gauging site according to workplace procedures
	2.3	Calculate the equipment configuration settings
	2.4	Securely position equipment on mounting device
	2.5	Take measurements during gauging and review data for abnormalities
	2.6	Pack and store equipment safely for transport
	3.1	Apply corrections to data where required
	3.2	Perform calculations of mean velocity, area and discharge according to workplace procedures
	3.3	Calculate and record the mean stage and rate of change
	4.1	Compare the discharge measurements with the current rating and record deviation
	4.2	Grade and record the gauging quality with interpretation comments
	4.3	Gather and document supporting information from the site and update gauging database
	4.4	Report site issues or significant deviations from ratings to relevant personnel and stakeholders

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit supersedes and is equivalent to NWPHYD014 Measure and process medium and high flows using a range of methods and equipment.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037>

Assessment Requirements for NWPHYD006 Measure discharge and process discharge data using a range of methods and equipment

Modification History

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria on at least one occasion and includes:

- applying corrections to measurements
- assembling and testing metering equipment
- assessing risks and applying precautions and action
- checking and preparing gauging section
- confirming and recording the percentage deviation from the rating determined by checking:
 - calculations
 - equipment
 - gauging station control
 - recording equipment
 - repeat measurement
- estimating and explaining the anticipated vertical distribution
- gathering and documenting supporting information relevant to the discharge measurement
- gathering, analysing, verifying, interpreting, storing, archiving and reporting data for a range of clients and stakeholders
- identifying, reporting and solving potential issues in relation to discharge measurement
- making calculations on depth and velocity
- measuring and calculating readings
- plotting discharge measurements on organisation's preferred scale
- selecting appropriate equipment and techniques relevant to site conditions transferring data to database
- using a range of suitable techniques to determine mean stage in rapidly changing situations
- using area velocity methods
- using formulae for determining the percentage deviation

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria and include knowledge of:

- client service agreements
- correction procedures for horizontal angles and suspension measurements
- discharge and mean stage adjustment
- equipment and required techniques including:
 - Acoustic Doppler Current Profiler (ADCP)
 - area slope method
 - area velocity method
 - dilution gauging
 - Doppler velocity meter
 - electromagnetic current meter
 - float gauging
 - mechanical current meter
- factors impacting on discharge measurements and the quality of the discharge
- impacts of site conditions, gauging techniques or equipment on discharge accuracy
- mathematical principles for area and velocity measurements
- methods for calculating mean velocity in a vertical
- methods for determining the cross-sectional area at a site
- principles and alternative methods of discharge measurement
- relevant legislation, industry standards, workplace policies and procedures including:
 - Bureau of Meteorology
 - international and national standards
 - work health and safety
 - World Meteorological Organisation
- requirements for surface velocity float measurements
- technical components in calculating discharge
- techniques for monitoring stage changes during discharge measurement
- weighted mean stage calculations

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including legislation, regulations, codes of practice, workplace procedures and operation manuals.

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