



Australian Government

NWPHYD014 Measure and process medium and high flows using a range of methods and equipment

Release: 1

NWPHYD014 Measure and process medium and high flows using a range of methods and equipment

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages. This unit supersedes and is equivalent to NWP421A Collect, measure and process hydrometric stream discharge gauging. • Unit code updated • Content and formatting updated to comply with the new standards • All PC transitioned from passive to active voice • Unit title changed to better reflect unit outcomes • One new PC added in Element 1 and all PC reordered • Element 2 all PC reordered and revised • PC 3.4 removed

Application

This unit describes the skills required to collect data using a range of discharge measuring methods and equipment, to measure and calculate readings and to interpret and report data for a range of clients and stakeholders.

This unit applies to hydrographers employed by the water industry and water operators involved in the monitoring of all the elements of the water cycle and their impact on the related environment.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to, particularly those relating to stream discharge measurement, registration, calibration, safe operation of equipment, identification of hazards, WHS, Bureau of Meteorology, World Meteorological Organisation and Australian Standards.

Those undertaking this unit would work in small teams, mostly under supervision, while performing complex tasks in a broad range of contexts, that could be unpredictable, including remote, confined spaces, near water and/or at heights.

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

Competency Field

Hydrography

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Identify flow gauging	1.1 Identify the monitoring objective of the site and gauging requirements. 1.2 Identify appropriate methods for measuring discharge. 1.3 Select equipment and confirm site conditions are within instrument specifications. 1.4 Identify stream discharge and factors affecting accuracy. 1.5 Identify hazards and implement risk management principles.
2. Collect depth and velocity data	2.1 Perform a pre-discharge measurement check on equipment. 2.2 Prepare the gauging site. 2.3 Calculate the equipment configuration settings. 2.4 Position equipment at pre-determined position. 2.5 Take measurements during gauging. 2.6 Review the data collected.
3. Calculate discharge	3.1 Apply corrections where necessary. 3.2 Calculate the mean velocity. 3.3 Calculate the area and discharge. 3.4 Calculate and record the mean stage and rate of change. 3.5 Calculate the channel storage and time of travel effects.
4. Report discharge readings	4.1 Compare the discharge measurements with the current rating. 4.2 Record the percentage deviation from the rating. 4.3 Grade and record the gauging quality with interpretation comments. 4.4 Gather and document supporting information from the site. 4.5 Enter gauging into ratings database.

Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

ACSF levels indicative of performance:

1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Learning					Reading					Writing					Oral communication					Numeracy				

Performance variables:

1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Support					Context					Text complexity					Task complexity				

Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

Range of Conditions

Methods include:	• area slope method • dilution gauging • float gauging • area velocity method • Doppler velocity meter • acoustic Doppler current profiler (ADCP) • electromagnetic current meter • mechanical current meter
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Unit Mapping Information

This unit supersedes and is equivalent to NWP421A Collect, measure and process hydrometric stream discharge gauging.

Links

Companion Volume implementation guides are found in VETNet -

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

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Assessment Requirements for NWPHYD014 Measure and process medium and high flows using a range of methods and equipment

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages. • Assessment Requirements created drawing upon specified assessment information from superseded unit

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. The candidate must be assessed in at least one of the methods listed in the Range of Conditions. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- using area velocity method
- assessing risks and applying precautions and action
- estimating and explaining the anticipated vertical distribution
- making calculations on depth and velocity
- maintaining the integrity of measurements
- using a range of suitable techniques to determine mean stage in rapidly changing situations
- adjusting measurements
- plotting discharge measurements on organisation's preferred scale
- using formulae for determining the percentage deviation
- using systems and/or software to transfer calculated flows to official database
- assembling and testing metering equipment
- checking and preparing gauging section
- setting tag lines
- measuring and calculating readings
- gathering, analysing, verifying, interpreting, storing, archiving and reporting data for a range of clients and stakeholders
- interpreting complex documentation
- sampling
- identifying, reporting and solving potential or current problems within scope of job function.
- recording the percentage deviation from the rating determined by checking:

- calculations
- equipment
- control
- recording equipment
- repeat measurement
- gathering and documenting supporting information from the site (i.e. gauging section location and access maps, photographic records, site preparation undertaken, comments on issues encountered, data management and reporting)

Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

- principles and alternative methods of discharge measurement
- methods for calculating mean velocity in a vertical
- methods for determining the cross-sectional area at a site
- requirements for surface, single and multipoint floats
- basic mathematical principles for area and velocity measurements
- correction procedures for horizontal angles and suspension measurements
- techniques for monitoring stage changes during discharge measurement
- weighted mean stage calculations
- discharge and mean stage adjustment
- technical components in calculating discharge
- factors impacting on discharge measurements and the quality of the discharge
- formulae to adjust gauging
- potential impacts of modifications of site, method or equipment on discharge accuracy
- confidence limits

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Measuring and processing flows: Assessment must occur on a minimum of two separate occasions, in at least two different locations, using a minimum of two different methods from a broad range of complex methods, with a maximum of one out of two from area velocity methods

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

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