



Australian Government
Bureau of Meteorology

WATER MONITORING STANDARDISATION TECHNICAL COMMITTEE

Basis for Endorsement

National Industry Guideline for Water Quality Metadata

NI GL101.00-2016

Version 1.0

April 2016

Version Status

Version	Revision Date	Author	Name of Document	Comment
0.1	3 November 2015	Grant Robinson	Basis for endorsement National Industry Guidelines for Water Quality Metadata	First draft
0.2	11 November 2015	Linton Johnston	Basis for endorsement National Industry Guidelines for Water Quality Metadata	Adjustment to Code for proposed National Guideline, amendments to History and Industry consultation sections
1.0	29 April 2016	Linton Johnston	Basis for endorsement National Industry Guideline for Water Quality Metadata	Final version as submitted to WaMSTeC, updated with finalised guideline code

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1 Purpose and Scope

The purpose of this document is to clearly present the case for endorsement of the National Industry Guideline for Water Quality Metadata. The document is as follows;

Code	Name of guideline
NI GL101.00-2016	National Industry Guideline for Water Quality Metadata

2 Background

The Water Monitoring Standardisation Technical Committee (WaMSTeC) was convened by the Bureau of Meteorology (the Bureau) as a successor to the Water Information Standards Business Forum (the Forum) in 2014 to advise on appropriate standards and guidelines for water information required by the water industry throughout Australia. The existence of WaMSTeC supports the Bureau in addressing its powers to set Water Information Standards and to consult with the States as requested in the *Water Act 2007* (Cwlth).

This guideline for water quality metadata began as two separate projects funded through the Bureau's Modernisation and Extension of Hydrological Monitoring Systems (M&E) program in 2009-10 and 2010-11. The first of these projects delivered a report *Scoping Information Management Protocols for Water Quality Monitoring in Queensland* published in July 2010. A second phase delivered a series of three reports published at <http://www.bom.gov.au/water/standards/projects/waterqlty.shtml>:

- Report A – Water Quality Metadata Guidelines (1.2 MB)
- Report B – Implementation Strategies (532 KB)
- Report C – Project Activity Report (1.3 MB)

After completion of the M&E projects the Forum and later WaMSTeC agreed to support and facilitate further consultation to develop the *National Industry Guideline for Water Quality Metadata*.

This guideline is now being submitted for endorsement by WaMSTeC. This Basis for Endorsement document is a requirement of the WaMSTeC's '*Guidelines and standards endorsement process*'. The primary audience is the WaMSTeC membership, and this document was made available to WaMSTeC representatives on Friday 6 November supplementing the final draft guideline delivered on Tuesday, 3 November 2015 ahead of the WaMSTeC endorsement decision. Once endorsement is achieved this document will be published with the guidelines on the Bureau of Meteorology website.

3 Guidelines for endorsement

Code	Name of guideline and brief summary
NI GL101.00-2016	Water Quality Metadata The purpose of this guideline is to identify the essential metadata requirements for water quality data to provide the requisite information to allow users to identify data fitness for their purposes.

4 History of the guidelines

The first drafts of these guidelines were completed during 2011 as project outputs from the Bureau funded M&E program.

The first part of the project was developed under M&E project 3QLD01.03 in 2009-2010. This project was coordinated by Rob De Hayr at the then Qld Department of Environment and Resource Management, delivering a report *Scoping Information Management Protocols for Water Quality Monitoring in Queensland* in July 2010.

The recommendations of this report were implemented by NSW Office of Water during 2010-2011 in M&E project 4NSW01.18 *Surface water quality data revitalisation and station detail recovery to improve data quality and accessibility*.

The second part of the project was developed in 2010-2011 under M&E project 4QLD01.08 *Water quality metadata and standards: protocols for improved metadata descriptions to ensure data interoperability for accurate, defensible interpretation to support decision making*. This project was again coordinated by Rob De Hayr at the Qld Department of Science, Information Technology and Innovation (then Department of Environment and Resource Management).

5 Context of the guidelines

The guidelines for water quality metadata have been developed in context of the Bureau's 'Improving Water Information' program. Under the *Water Act 2007*, the Bureau has key functions to enhance understanding of Australia's water resources. These include responsibilities to "collect, hold, manage, interpret and disseminate Australia's water information" and to "issue National Water Information Standards".

The Bureau does not measure and capture the water information itself, but relies on over 200 organisations around the nation who gather and supply the data. Within those organisations, data are generated for many different purposes to satisfy a spectrum of business needs. Consequently there have been a considerable range of standards, practices and procedures applied across the country at each stage along the data value chain.

This guideline presents recommended Australian industry practice for water quality metadata. The document brings together practical guidance on metadata requirements with reference to international standards such as WaterML2 and ISO19115.

At each stage of development the authors and reviewers of these guidelines have been cognisant of the range of relevant national and international standards. Following CSIRO feedback, the project team adapted the guideline to recognise new standards.

The guideline includes lists of normative references. These are existing standards, guidelines or specifications which are directly referred to within the guideline and constitute provisions therein. They include relevant ISO standards, Australian Standards and WMO guides.

6 Statement of benefit

This National Industry Guideline applies to water quality data collected and being supplied to the Bureau of Meteorology under the *Water Regulations 2008* (the regulations) by persons named in the regulations. It pertains solely to those water quality data parameters being collected from surface water and groundwater as identified in the regulations. It provides guidance about mandatory and optional metadata elements and describes data entities (or groupings) that are meaningful and pragmatic for hydrographical, laboratory and hydrologic practitioners at a national level.

The guideline is applicable to both automated continuous water quality monitoring (e.g. using in-situ sensors or probes), tests performed in the field and grab samples sent for laboratory testing.

Implementation of the guideline will facilitate consistent collection of water quality metadata, and will improve the interoperability, quality and future usefulness of the water quality data.

7 Industry consultation

Each of the Bureau funded projects involved extensive consultation.

The 2009-2010 project involved representatives from several state agencies and a representative of NSW Office of Water.

The 2010-2011 project began with consultation with lead water agencies in all jurisdictions. In February 2011, the project hosted a workshop in Brisbane with representatives from all states and the Commonwealth:

Jurisdiction	Agency/Company
Commonwealth	Bureau of Meteorology
NSW	Sydney Water
	NSW Office of Water
Queensland	Department of Environment and Resource Management
	Queensland Health Forensic Scientific Services
	UniDap Solutions
	SEQ Catchments
	Fitzroy Basin Association Inc,
	Queensland Murray Darling Committee
	Queensland Water
SA	EPA
Tasmania	Hydro Tasmania
	Southern Water
	Department of Primary Industries, Parks, Water and Environment
Victoria	Department of Sustainability & Environment
	Melbourne Water
WA	Water Corporation
	Department of Environment and Conservation
	Department of Water

The M&E project completed with a series of three reports published in July 2011.

The next phase of consultation began in 2013 when the Water Information Standards Business Forum (succeeded by WaMSTeC) agreed that the Bureau should coordinate national consultation through a Technical Reference Group (TRG).

Subsequently a TRG was convened by the Bureau and project manager Rob De Hayr early in 2014. This TRG was made up of discipline specialists in the field of water quality and information management. The consultation was started with a teleconference of TRG members in February 2014 where the TRG Terms of Reference was adopted and the initial draft guideline reviewed. The second draft Guideline was redistributed to TRG members along with the draft context document for further consultation. The TRG met again in May 2014 to consider feedback and the third draft was prepared as part of the TRG review process. This draft Guideline and accompanying context document were passed by a sub-committee of the then Water Information Standards Business Forum allowing the Guideline to proceed to Industry Consultation. Invitation to comment on the Guideline was distributed through the AWA and AHA networks, the TRG and participants of the workshops held as part of the consultation process in the original M&E project 4QLD01.08.

Industry consultation took place in mid-late 2014 and their comments were considered during two meetings of the TRG in February 2015 where agreement was gained for a final list of metadata elements. However, initial feedback from CSIRO indicated concerns and the conclusion that "we cannot recommend its endorsement as a national guideline at this stage". Subsequently a small team met with CSIRO to address their concerns, and a fourth draft was prepared and adopted by the TRG in October 2015.

8 Summary

The National Industry Guideline for water quality metadata will be presented to WaMSTeC for endorsement at the upcoming meeting on 30th November 2015. The guideline was initially developed through M&E funded projects led by the former Queensland Department of Environment and Resource Management—now Qld Department of Science, Information Technology and Innovation. The guideline has been created in the context of the Bureau's national water information program and aim to raise the level of consistent practice across the water industry. The authors have collaborated with national industry experts and practitioners to produce current guidance appropriate to Australian conditions, and have been cognisant of the range of relevant national and international standards. If broadly adopted, the guideline will offer benefits to agencies managing water quality information, and to software vendors who support those agencies as well as assisting end users of data to judge fitness for their purposes.

Extensive industry input and consultation has been a feature of the development and review processes for National Industry Guidelines. A Technical Reference Group significantly contributed to final review and redrafting of the Water quality metadata guideline and has recommended it to WaMSTeC for endorsement.

National Industry Guidelines should be considered as living documents. The status of endorsed guidelines shall be periodically reviewed by WaMSTeC at intervals of no greater than five years. In the review phase, consideration will be given to any issues or requests for changes raised by industry. The review process will ensure the guidelines remain technically sound and up to date with technological advancements. Should WaMSTeC cease to exist, the Bureau will ensure continuity of the governance process or delegate it to an alternative organisation or body.

9 References

- De Hayr, Rob and Ryan, Jennifer (2010) *Scoping Information Management Protocols for Water Quality Monitoring in Queensland*. Department of Environment and Resource Management, Queensland. July 2010.
- van Willigen, Gabi, Ryan, Jennifer and De Hayr, Rob (2011) *National Information Management Protocols for Water Quality Monitoring: Report A – Water Quality Metadata Guidelines*. Department of Environment and Resource Management, Queensland. July 2011 <http://www.bom.gov.au/water/standards/projects/waterqlty.shtml> accessed 3 November 2015
- van Willigen, Gabi, Ryan, Jennifer and De Hayr, Rob (2011) *National Information Management Protocols for Water Quality Monitoring: Report B – Implementation Strategies*. Department of Environment and Resource Management, Queensland. July 2011 <http://www.bom.gov.au/water/standards/projects/waterqlty.shtml> accessed 3 November 2015
- van Willigen, Gabi, Ryan, Jennifer and De Hayr, Rob (2011) *National Information Management Protocols for Water Quality Monitoring: Report C – Project Activity Report*. Department of Environment and Resource Management, Queensland. July 2011 <http://www.bom.gov.au/water/standards/projects/waterqlty.shtml> accessed 3 November 2015
- WaMSTeC (2014) *Guidelines and standards endorsement process*. Version 3.0, December 2014.

Water Quality Technical Reference Group

Statement of Recommendation

on

National Industry Guidelines for Water Quality Metadata

Preamble

The Bureau of Meteorology (the Bureau) is working closely with water industry organisations to establish consistent standards and guidelines for water information. National Industry Guidelines (Guidelines) are being developed to promote consistent and comparable water data collection across various collecting organisations throughout Australia. Draft Guidelines have now been developed for *Water Quality Metadata*.

In close collaboration with the Bureau through the Water Monitoring Standardisation Technical Committee (WaMSTeC), the Water Quality Metadata project manager has established a Technical Reference Group (TRG) made up of discipline specialists in the field of water quality information. One of the primary purposes of the Water Quality Metadata TRG is to provide expert review of draft *Guidelines* on water quality metadata. The TRG will also assist WaMSTeC in their decision to endorse the Guidelines by making an industry-representative recommendation.

The Terms of Reference for the TRG was forwarded to all members prior to their first meeting, and provides further detail on TRG purpose and membership.

Process followed

During 2014, the Project Manager with support from the Bureau undertook an extensive national industry consultation process on the draft *Guideline*. A revised draft *Guideline* was produced incorporating comment and input received during that consultation phase. The TRG was provided with the revised draft *Guidelines*. The TRG was tasked with reviewing the *Guidelines* to;

- ensure previous comment and input from the previous consultation process has been faithfully incorporated into the revised drafts; and
- make any additional comment and input to ensure the *Guidelines* have the support of industry.

All additional comment and input submitted by TRG members was considered by the full TRG during February 2014 and May 2014. A decision was reached in response to each comment, and further revisions were made to the *Guidelines* as appropriate.

Subsequently, feedback from CSIRO highlighted potential inconsistencies between the draft guideline and international standards including ISO19115, ISO19156:2011, OGC WaterML2 and OGC WaterML-WQ. In September 2015, Project Manager Rob De Hayr (DSITI) with Linton Johnston and Kema Ranatunga (BoM) and Grant Robinson (AHA) met with CSIRO to address their concerns. Subsequently a further round of consultation with the TRG members resulted in a final draft completed on 3 November 2015.

At completion of the task, the TRG was called upon to make a recommendation to WaMSTeC that this *Guideline* be endorsed (this document).

Water Quality TRG

TRG Meetings



- The TRG met on 13 February 2014 and 29 May 2014
- TRG meetings were attended by members from 12 different organisations from 7 jurisdictions (TRG membership listed in Schedule A). In total of 18 members of the TRG actively participated in the meetings and took part in the *Guideline* review task.

Recommendations

The TRG recommends that the draft National Industry Guidelines for Water Quality Metadata be submitted to the Water Monitoring Standardisation Technical Committee (WaMSTeC) for endorsement.

This TRG acknowledges that further work is required, including future revision of these guidelines, and is keen to continue to support WaMSTeC.

Signed by TRG Chair

	
Rob De Hayr (Project Manager and TRG Chair)	Kema Ranatunga (Witness)
Date: 2 December 2015	Date: 2 December 2015

Schedule A – TRG membership

First name	Last name	Interest	Agency
Jacquie	Bellhouse	WA	Water Corporation
Ulrike	Bende-Michl	Cwlth	Bureau of Meteorology
Daniel	Harris	NSW	DPI Water (from late 2014)
Rob	De Hayr	Qld	Department of Science, Information Technology and Innovation
John	Hayes	NSW	DPI Water
Christopher	Hepplewhite	Cwlth	Environment
Marty	Jack	Tas	Department of Primary Industries, Parks, Water and Environment
Linton	Johnston	Cwlth	Bureau of Meteorology
David	Malone	Cwlth	Bureau of Meteorology (to 30 June 2014)
Carolyn	Maxwell	Tas	Hydro Tasmania
Monika	Muschal	NSW	DPI Water
Ataur	Rahman	National	University of Western Sydney
Kema	Ranatunga	Cwlth	Bureau of Meteorology
Grant	Robinson	National	Australian Hydrographers Association
Katrina	Rodriguez	Qld	Department of Natural Resources and Mines
Sabine	Shreiber	Vic	Department of Environment and Primary Industries
Shaun	Thomas	SA	Environmental Protection Agency South Australia
Laura	Torrible	Cwlth	Bureau of Meteorology (to 30 June 2014)
Damien	Venema	SA	SA Water
Daniel	Wagenaar	NT	Dept. of Land Resource Management
Nicholas	Car	Qld	CSIRO