Environment Canada Environnement Canada

CERTIFIED REFERENCE MATERIAL

TM-DWS.3, lot 0913

A trace element fortified sample

Trace element Certified Reference Materials (CRMs) are made with filtered and diluted Lake Ontario water and are preserved with 0.2% nitric acid. This fortified bulk CRM has concentrations ranges appropriate for drinking water analysis. Trace element CRMs are noted for their integrity and consistency, and are monitored in additional Proficiency Testing (PT) studies. "For Information" values indicate insufficient data exists to meet CRM certification criteria. The values and statistics for this CRM are derived from PT studies 98, 100, and 102 dated September 2011, September 2012, and September 2013 respectively. A more detailed report on the methods used in our PT studies for specific parameters is available upon request. Please note that expiry dates of 2 years from the date of shipping are not indicative of sample stability, but rather of sample transport, handling and storage. We strongly recommend that the CRM be tightly capped and refrigerated immediately after use.

Measurand	**Value[a] in µg/L**	**±2σ[b]**	**C.I.[c]**	**Studies / Results (N)**
Aluminum	57.0	6.64	0.72	3/83
Antimony	3.39	0.413	0.050	3/66
Arsenic	4.75	0.493	0.056	3/76
Barium	146	8.56	0.92	3/85
Beryllium	14.1	1.48	0.17	3/76
Boron	80.2	9.62	1.20	3/63
Cadmium	4.80	0.401	0.042	3/89
Chromium	43.9	3.03	0.30	3/100
Cobalt	51.1	3.42	0.38	3/81
Copper	163	10.8	1.09	3/96
Iron	223	22.5	2.30	3/93
Lead	6.87	0.612	0.070	3/75
Lithium	20.0	1.75	0.24	3/53
Manganese	47.4	3.68	0.38	3/92
Molybdenum	65.5	5.46	0.61	3/78
Nickel	82.7	5.40	0.56	3/92
Selenium	9.20	1.17	0.13	3/75
Strontium	238	14.9	1.72	3/73
Thallium	8.47	0.722	0.089	3/64
Uranium	14.4	1.17	0.14	3/64
Vanadium	45.1	3.22	0.35	3/83
Zinc	388	34.3	3.45	3/97
For information				
Bismuth	13	35 Results		
Rubidium	0.5	23 Results		
Silver	9	74 Results		

[a] Outliers of > 3 std. dev. excluded and are calculated with 'Robust Analysis' Annex C, ISO DIS 13528:2005(E).
[b] 2-sigma limit for an individual measurement.
[c] 95% confidence interval on the population mean (σ x 1.96) ÷ √ N.

Canada

Last Updated: September 2013

Certified Reference Materials (CRMs) are valuable and necessary tools for validating the analytical results in environmental research and monitoring programs. These water reference materials are intended for the verification or development of analytical methods for environmental analysis.

Development and Certification

Reference waters are collected in bulk from various locations across North America. Waters are centrifuged, filtered and stored refrigerated. Certification is by means of large interlaboratory Proficiency Testing (PT) studies. This normally occurs over a minimum time span of 3 years, thus giving a good indication of sample stability and homogeneity.

Traceability

The property values and measurement uncertainties are derived from statistical analysis of the interlaboratory consensus data from the PT studies identified in the sample description. Report details of each individual PT study are available in pdf format.

Stability, Storage and Handling

The certification and stability of CRMs are subject to uncertainties. The inherently complex nature of natural water samples and environmental analyses should be observed as they may not be completely free of errors. CRMs should be handled by qualified personnel with good laboratory practices to ensure their integrity. In addition, CRMs are necessarily shipped by commercial couriers under non-controlled conditions and storage may be subject to foreign and unknown customs regulations.

CRMs should be stored refrigerated, well sealed and in the dark. Care should be taken when subsampling to avoid contamination of the sample bottle. It is recommended that users purchase new CRMs as required or as expiry dates are reached.

Disclaimer, Liability & Warranty

Certified values for these CRMs are based on performance based methods used by laboratories in Environment Canada's interlaboratory PT program. Environment Canada warrants that the materials conform to the certificate values. In the event of a breach of this warranty, Environment Canada will only be liable for a replacement sample, an equivalent substitute, or the invoice price of the CRM. In no event will Environment Canada be liable for direct, indirect, special, incidental or consequential damages arising from the use of or inability to use the material or documentation, or for the loss of revenue or profit, even if advised of the possibility of such damages.

Further Information

Additional information is available on request. Analytical results, any comments or suggestions will be most welcome. Difficulties or discrepancies arising with the certified materials should be communicated immediately.

Certifying Officer

Jayne Simser
PT Technical Manager/Quality Manager
E-mail: Jayne.Simser@ec.gc.ca

Comments, concerns, or information inquiries may be addressed to:

Attention:
CRM Sales
Information and Quality Management Group
Emergencies, Operational Analytical Laboratories & Research Support Division
Water Science & Technology Directorate

Environment Canada
867 Lakeshore Road
Burlington, ON L7R 4A6
CANADA

Tel: +1 905-336-4653
Fax: +1 905-336-8914
E-mail: CRMsales@ec.gc.ca

Website English http://www.ec.gc.ca/inre-nwri/Default.asp?lang=En&n=D3D76BEC-1
Website French http://www.ec.gc.ca/inre-nwri/default.asp?lang=Fr&n=BD7B3283-1