

**TABLE A.1. DATA QUALITY OBJECTIVES (DQOS) FOR GAW PRECIPITATION CHEMISTRY MEASUREMENTS (revised 1 January 2018)**

| Measurement Parameter                               | Detection Limits | Precision   |  | Inter-Network Bias                                 |   | Calibration Levels   | Completeness                                    |
|---|------------------|---|--|--|---|--|---|
|   |                  | Overall   | Laboratory   | Overall  | Laboratory  |  |   |
| pH (pH units)                                       | n/a              | ± 0.1 pH unit at pH > 5<br>± 0.03 pH unit at pH < 5 | ± 0.04 pH unit at pH > 5<br>± 0.02 pH unit at pH < 5 | ±0.24 pH unit at pH > 5<br>±0.12 pH unit at pH < 5 | ±0.05 pH unit at pH <4.00<br>±0.07 pH unit at pH 4.00– 4.99<br>±0.10 pH unit at pH ≥ 5.00 | 4.0 & 7.0<br>low ionic strength reference<br>solution                                | 90 %PCL <sup>(1)</sup><br>70 %TP <sup>(2)</sup> |
| Conductivity (µS cm <sup>-1</sup> )                 | ± 2              | *   | *  | *  | ± 7%  | In range between the 2 <sup>nd</sup> & 98 <sup>th</sup><br>percentile concentrations | 90 %PCL <sup>(1)</sup><br>70 %TP <sup>(2)</sup> |
| Acidity/Alkalinity (µmole L <sup>-1</sup> )         | n/a              | *   | *  | *  | ± 25%   | In range between the 2 <sup>nd</sup> & 98 <sup>th</sup><br>percentile concentrations | 90 %PCL <sup>(1)</sup><br>70 %TP <sup>(2)</sup> |
| SO <sub>4</sub> <sup>2-</sup> (mg L <sup>-1</sup> ) | 0.06             | 0.06  | 0.03   | ± 0.42   | ± 5%  | In range between the 2 <sup>nd</sup> & 98 <sup>th</sup><br>percentile concentrations | 90 %PCL <sup>(1)</sup><br>70 %TP <sup>(2)</sup> |
| NO <sub>3</sub> <sup>-</sup> (mg L <sup>-1</sup> )  | 0.09             | 0.06  | 0.03   | ± 0.36   | ± 5%  | In range between the 2 <sup>nd</sup> & 98 <sup>th</sup><br>percentile concentrations | 90 %PCL <sup>(1)</sup><br>70 %TP <sup>(2)</sup> |
| Cl <sup>-</sup> (mg L <sup>-1</sup> )               | 0.04             | 0.02  | 0.02   | ± 0.05   | ± 10%   | In range between the 2 <sup>nd</sup> & 98 <sup>th</sup><br>percentile concentrations | 90 %PCL <sup>(1)</sup><br>70 %TP <sup>(2)</sup> |
| F <sup>-</sup> (mg L <sup>-1</sup> )                | *                | *   | *  | *  | ± 20%   | In range between the 2 <sup>nd</sup> & 98 <sup>th</sup><br>percentile concentrations | 90 %PCL <sup>(1)</sup><br>70 %TP <sup>(2)</sup> |
| NH <sub>4</sub> <sup>+</sup> (mg L <sup>-1</sup> )  | 0.02             | 0.02  | 0.01   | ± 0.08   | ± 7%  | In range between the 2 <sup>nd</sup> & 98 <sup>th</sup><br>percentile concentrations | 90 %PCL <sup>(1)</sup><br>70 %TP <sup>(2)</sup> |
| Ca <sup>++</sup> (mg L <sup>-1</sup> )              | 0.02             | 0.02  | 0.01   | ± 0.05   | ± 15%   | In range between the 2 <sup>nd</sup> & 98 <sup>th</sup><br>percentile concentrations | 90 %PCL <sup>(1)</sup><br>70 %TP <sup>(2)</sup> |
| Mg <sup>++</sup> (mg L <sup>-1</sup> )              | 0.01             | 0.01  | 0.01   | ± 0.02   | ± 10%   | In range between the 2 <sup>nd</sup> & 98 <sup>th</sup><br>percentile concentrations | 90 %PCL <sup>(1)</sup><br>70 %TP <sup>(2)</sup> |
| Na <sup>+</sup> (mg L <sup>-1</sup> )               | 0.02             | 0.01  | 0.01   | ± 0.03   | ± 10%   | In range between the 2 <sup>nd</sup> & 98 <sup>th</sup><br>percentile concentrations | 90 %PCL <sup>(1)</sup><br>70 %TP <sup>(2)</sup> |
| K <sup>+</sup> (mg L <sup>-1</sup> )                | 0.02             | 0.01  | 0.01   | ± 0.02   | ± 20%   | In range between the 2 <sup>nd</sup> & 98 <sup>th</sup><br>percentile concentrations | 90 %PCL <sup>(1)</sup><br>70 %TP <sup>(2)</sup> |
| Formate (mg L <sup>-1</sup> )                       | *                | *   | *  | *  | *   | In range between the 2 <sup>nd</sup> & 98 <sup>th</sup><br>percentile concentrations | 90 %PCL <sup>(1)</sup><br>70 %TP <sup>(2)</sup> |
| Acetate (mg L <sup>-1</sup> )                       | *                | *   | *  | *  | *   | In range between the 2 <sup>nd</sup> & 98 <sup>th</sup><br>percentile concentrations | 90 %PCL <sup>(1)</sup><br>70 %TP <sup>(2)</sup> |
| Standard Gauge Precipitation Depth (mm)             | 0.2              | 0.2 daily<br>0.3 weekly                             | n/a  | ± 5% for rain<br>± 15% for snow<br>± 10%rain/snow  | n/a   | In range between the 2 <sup>nd</sup> & 98 <sup>th</sup><br>percentile depth values   | 95% PCL- annual<br>90% PCL-<br>quarterly        |
| Sample Depth (mm)                                   | 0.2              | 0.1 daily<br>0.3 weekly                             | n/a  | ± 5% for rain<br>± 15% for snow<br>± 10%rain/snow  | n/a   | In range between the 2 <sup>nd</sup> & 98 <sup>th</sup><br>percentile depth values   | 90 %PCL <sup>(1)</sup><br>70 %TP <sup>(2)</sup> |

\* Not Available

n/a Not Applicable

- 1) %PCL is Percent Precipitation Coverage Length (see Section 6.10.3). The 90%PCL completeness criterion applies to annual and seasonal summary periods. For annual summary periods, each quarter of the year must also meet a 60%PCL completeness criterion.
- 2) %TP is the Percent Total Precipitation (see Section 6.10.3). The 70% completeness criterion applies to annual and seasonal summary periods. For annual summary periods, each quarter of the year must also meet a 60%TP completeness criterion.