Data Validation Criteria for Water Quality Parameters Measured in the Field

Data Validation Chiena for Water Quality Farameters Measured in the Field								
Data Quality Level	Quality Assurance Plan	Water Temperature Methods	pH Methods	Dissolved Oxygen Methods	Turbidity Methods	Conductivity Methods	Bacteria Methods	Data Uses
А	Approved QAPP	Thermometer Accuracy checked with NIST standards $A \leq \pm 0.5^{\circ}\text{C}$ $P \leq \pm 0.5^{\circ}\text{C}$	Calibrated pH electrode $A \leq \pm \ 0.2 \ S.U.$ $P \leq \pm \ 0.3 \ S.U.$	Winkler titration $A \le \pm 0.2 \text{ mgL}$ $P \le \pm 0.3 \text{ mgL}$ Calibrated oxygen meter/LDO Accuracy: $\le + 0.4 \text{ mgL}$ $\ge -0.3 \text{ mgL}$ $P \le \pm 0.3 \text{ mgL}$	Nephelometric Turbidity meter A $\leq \pm 10\%$ Standard value P $\leq \pm 20\%$ (± 3 NTU if NTU < 20)	Meter with temp correction to 25°C A ≤ ± 7% of standard value P ≤ ± 10%	DEQ Approved Methods Absolute difference between log-transformed values P ≤ 0.6 log	Regulatory, permitting, compliance (e.g., 303(d) and 305(b) assessments)
В	Minimum Data Acceptance Criteria Met	Thermometer Accuracy checked with NIST standards $A \leq \pm 1.0^{\circ}\text{C}$ $P \leq \pm 2.0^{\circ}\text{C}$	Any Method $A \leq \pm \ 0.5 \ S.U.$ $P \leq \pm \ 0.5 \ S.U.$	Winkler titration or Calibrated oxygen meter/LDO A ≤ ± 1 mgL P ≤ ± 1 mgL	Any Method A ≤ ± 30% P ≤ ± 30%	Meter with temp correction to 25° C A $\leq \pm 10\%$ of standard value P $\leq \pm 15\%$	DEQ Approved Methods Absolute difference between log-transformed values P ≤ 0.8 log	Regulatory, permitting, compliance (e.g., 303(d) and 305(b) assessments) with professional judgment
С		A > ± 1.0°C P > ± 2.0°C	A > ± 0.5 S.U. P > ± 0.5 S.U.	A > ± 2 mgL P > ± 2 mgL	A > 30% P > 30%	A > ± 10% P > ± 15%	Absolute difference between log- transformed values P > 0.8 log	Not to used for 303(d) and 305(b) assessments Based on project manager judgment, the data may be Voided with a DQL of D.
D		Missing or voided data	Missing or voided data	Missing or voided data	Missing or voided data	Missing or voided data	Missing or voided data	Missing or voided data
E	No QAPP provided	No precision or accuracy checks available	Any Method No precision or accuracy checks available	Any Method No precision or accuracy checks available	Any Method No precision or accuracy checks available	Meter without routine calibration No precision or accuracy checks available	Any Method No precision or accuracy checks available	Informational purposes only
F	See definitions table	See definitions table	See definitions table	See definitions table	See definitions table	See definitions table	See definitions table	See definitions table

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Notes:

QA definitions of Data Quality Levels

- A Data of known quality; meets QC limits established in a DEQ approved QAPP.
- **B Data of known but lesser quality**; Data may not meet established QC but is within marginal acceptance criteria; or data value may be accurate, however controls used to measure Data Quality Objective (DQO) elements failed (e.g., batch failed to meet blank QC limit); the data is generally usable for most situations or in supporting other, higher quality data. **(Equivalent to the "J" (estimated) qualifier used by EPA).**

Note: Statistics for **turbidity**, **conductivity**, and **bacteria** are concentration-dependent; thus low-concentration B level data may be considered acceptable for all uses.

- C **Data of unacceptable quality**; Generally due to QC failures but may be related to other known information about the sample. Data should not be used for quantitation purposes but may have qualitative use. (Equivalent to the "R" (rejected) validation qualifier used by EPA)
- **D No data available**; No sample collected or no reportable results. Samples are either voided or canceled.
- **E Data of unknown quality**; Insufficient QA/QC or other information available to make determination. Data could be acceptable; however, no evidence is available to prove either way. Data is provided for Educational Use Only.
- **F Exceptional event**; "A" quality data (data is of known quality), but not representative of sampling conditions as required by the project plan.(e.g., a continuous water quality monitor intended to collect background environmental conditions collects a sample impacted by a fire that created anomalous conditions to the environment).

Data Quality Level Grading Criteria:

- **A** = Accuracy as determined by comparison with standards, e.g., during equipment calibration or pre- and post-deployment checks
- **P** = Precision as determined by replicate measurements, e.g., during field duplicates, field audits, or split samples