

*Review and Approval Guidance: Water Quality (WQ) Records*

**Record Period:** *Dates of record period associated with this approval*

**Approver:** *Name of record-period approver (should not be the same as the collector/analyst)*

Routine records review and approval ([TM1-D3](#)--Wagner and others, 2006; [TM1-D5](#)--Pellerin and others, 2013)

1. Field Notes, Cross-section surveys, Station Description:
  - 1.1. Were field notes and cross-section notes adequately reviewed and were these reviews documented in accordance with [TM1-D3](#), [TM1-D5](#), and WSC procedures? (if not, this task must be completed before approval)
  - 1.2. Has the Station Description been properly updated to reflect any changes made during record period?
  - 1.3. Were all of the notes and documents properly archived in accordance with the WSC data archive plan.
2. Cross-section surveys:
  - 2.1. Dates of the last three cross-section surveys:
  - 2.2. How many cross-section surveys were done over the last 12 months? Was vertical mixing verified in at least one of those cross-section surveys?

See frequency requirements below (Wagner and others, 2006). If a cross-section survey is overdue, or determined to be invalid, the record period should not be approved until a cross-section survey is made.
  - 2.3. Were the results from the cross-sectional surveys compared with time-series measurements from the in-situ monitor during the record period?
    - 2.3.1. How do the differences between cross-sectional survey results and time-series measurements compare with previous differences? Should a cross-section correction be applied to the time series (page 35, [TM1-D3](#)).
    - 2.3.2. Does the differences indicate that the frequency of cross-section measurements should be increased or should certain hydrologic events be targeted?
3. Instantaneous Value Edits:
  - 3.1. Were erroneous instantaneous values removed?
    - 3.1.1. Was the basis of removal adequately discussed in the station analysis?
  - 3.2. Was backup data available, downloaded, and used to fill any gaps in transmissions?
    - 3.2.1. Were these adequately discussed in the station analysis?
  - 3.3. Were periods of missing record properly identified?
4. Fouling Corrections:

- 4.1. Were fouling corrections applied when the sum of the absolute values of the fouling and drift errors exceeded the correction criterion for the parameter (table 10, [TM1-D3](#) and [TM1-D5](#))? If not, why.
- 4.2. Were fouling correction applied when the sum of the absolute values of the fouling and drift errors did not exceeded the correction criterion for the parameter? Explain why.
- 4.3. Is the applied timing of any fouling correction valid and does it agree with the rationale provided in the station analysis?
- 4.4. Have larger corrections been adequately discussed?
- 4.5. Were fouling corrections properly input using correction set 1?
5. Calibration Drift Corrections:
  - 5.1. Do calibration standards bracket the measured values?
  - 5.2. Were calibration drift correction applied when the sum of the absolute values of the fouling and drift errors exceeded the correction criterion for the parameter (table 10, [TM1-D3](#); table 5, [TM1-D5](#))?
  - 5.3. Is the applied timing of any calibration drift correction valid and does it agree with the rationale provided in the station analysis?
  - 5.4. Have larger corrections been adequately discussed?
  - 5.5. Were calibration drift corrections properly input using correction set 2?
6. Other types of data corrections:
  - 6.1. Were other types of data corrections (cross-section correction, etc) defined and applied during the record period? (if no, go on to section 7)
  - 6.2. Were corrections defined and applied?
    - 6.2.1. Do correction values agree with differences observed between mean or median cross-sectional value? (examine field notes and compare the difference of the cross-section reading nearest the monitor)
    - 6.2.2. Is the timing of the application of correction valid and does it agree with the rationale provided in station analysis?
    - 6.2.3. Were corrections properly input using correction set 3?
7. Daily values:
  - 7.1. Were partial and missing daily values (DV) validated and discussed in the station analysis?
  - 7.2. Were DVs derived from instantaneous values outside of the guidance in [TM1-D3](#) (pgs 38-9) justified in the station analysis?
  - 7.3. If force interpolation was used, was it noted in the station description and were all statistics verified?
8. Graphic Comparison:
  - 8.1. Did corrections result in a smooth data trace? If they caused any changes in the extremes, these should be reviewed closely.
  - 8.2. Have graphic comparisons been adequately made and discussed in the station analysis.
  - 8.3. Were any unusual patterns or anomalies noted and explained. Observations should include unusual seasonal and diurnal patterns, storms, and changes in channel morphology and(or) deployment of the sonde,

9. Approval Evaluation: Provide brief assessment of the record period in context of the findings outlined above. Discuss analyst's evaluation / quality rating of record and provide your evaluation.

#### References Cited

Pellerin, B.A., Bergamaschi, B.A., Downing, B.D., Saraceno, J.F., Garrett, J.A., and Olsen, L.D., 2013, Optical techniques for the determination of nitrate in environmental waters: Guidelines for instrument selection, operation, deployment, maintenance, quality assurance, and data reporting: U.S. Geological Survey Techniques and Methods 1–D5, 37 p., accessed August 25, 2017 at <http://pubs.usgs.gov/tm/01/d5/>.

Wagner, R.J., Boulger R.W., Oblinger C.J. and Smith, B.A, 2000, Guidelines and standard procedures for continuous water-quality monitors: Station operation, record computation, and data reporting: U.S. Geological Survey Techniques and Methods Book 1, chap D3 WRI 00-4252, 51 p., accessed August 25, 2017, at <https://pubs.usgs.gov/tm/2006/tm1D3/>.