



DWR–NPDES–SOP–G–12–Quick Reference for Method Update Rule-01012024
12 Steps of Quality Assurance

DISCLAIMER: This document is guidance only and does not create legal rights or obligations. Agency decisions in any particular case will be made applying applicable laws and regulations to the specific facts.

1) EFFECTIVE DATE: 01/01/2024

2) SIGNATURES:

A handwritten signature in black ink that reads "April Grippo".

April Grippo (May 30, 2024 16:25 CDT)

April Grippo, DWR Interim Director

A handwritten signature in blue ink that reads "Brianne Begley".

Brianne Begley, Environmental Consultant
Drafter / Preparer

A handwritten signature in blue ink that reads "Stephanie Durman".

Stephanie Durman, Deputy General Counsel
Reviewer

DWR–NPDES–SOP–G–12–Quick Reference for Method Update Rule-01012024
12 Steps of Quality Assurance

12 Steps of Lab Quality Assurance

Parameter	Method	DOC	MDL	Method Blank	LFB	LFM / LFMD	Dup	ICV / CCV	Control Charts	Corrective Action	QC Acceptance	Batch Size	*QC Frequency
Ammonia	SM4500-NH3 D - 2011	X	X	X	X	X		X, Calibrate meter daily	X	X	X	20	Depends on Permit
BOD₅ / CBOD₅	SM5210 B - 2016	X		X	X		X	X, Calibrate meter daily	X	X	X	20	Depends on Permit
Chlorine, TR	SM4500-Cl G - 2010	X	X	X	X		X	X, verify meter daily w Secondary Gel Standards	X	X	X	20	Depends on Permit
pH	SM4500-H+ B - 2011	X					X	X, Calibrate meter daily	X	X	X	20	Depends on Permit
Oxygen, dissolved	SM4500-O G - 2016	X					X	X, Calibrate meter daily & verify with air-saturated water	X	X	X	20	Depends on Permit
	SM4500-O H - 2016	X					X	X, Calibrate meter daily & verify with a blank and a control	X	X	X	20	Depends on Permit
	Hach Method 10360 Luminescence Oct. 2011	X					X	X, Calibrate meter daily & verify with air-saturated water	X	X	X	20	Depends on Permit
Phosphorus, total	SM4500-P B and E - 2011	X	X	X	X	X		X, verify meter	X	X	X	20	Depends on Permit
TSS	SM2540 D - 2015	X	X*	X	X		X	X, verify scale daily	X	X	X	20	Depends on Permit
Sett. Solids	SM2540 F - 2015	X					X		X	X		20	Depends on Permit
Temperature	SM2550 B - 2010							X, verify against NIST thermometer		X			Annually

DWR–NPDES–SOP–G–12–Quick Reference for Method Update Rule-01012024

12 Steps of Quality Assurance

DOC – Demonstration of Capability

- Each analyst should have a file kept from where they have calibrated and analyzed 4 standards to demonstrate they can accurately run this test
- Documentation (signed form) that analyst has read and understands all appropriate SOPs and Methods
- Recommend backup analyst do this once a year

MDL – Method Detection Limit (Effective September 27, 2018)

- Initial MDL, run at least seven (spiked) samples at low levels and seven method blanks
- On-going, each quarter, analyze a minimum of two (spiked) samples
- On-going method blank population should include all routine method blanks analyzed with each batch during the course of sample analysis
- For ongoing annual verification - need at least two spikes and at least two method blanks each quarter for the past 24 months (unless no analysis performed)
- Annual (every 13 months) verification required using seven (spiked) samples at low levels and seven method blanks
- More detailed discussion can be found in the [MDL Examples and EPA Guidance document](#), as well as 40 CFR 136 Appendix B
- For TSS, only the method blanks are required to determine the MDL (*MDL_b only*)

Method Blank – aka Laboratory Reagent Blank (LRB)

- Analyze distilled/deionized water as a sample

LFB – Laboratory Fortified Blank

- Analyze a known standard

LFM/LFMD – Laboratory Fortified Matrix/Laboratory Fortified Matrix Duplicate

- Analyze a sample with a known amount of standard added (spike)

Dup – Duplicate

- Analyze the same sample twice

DWR–NPDES–SOP–G–12–Quick Reference for Method Update Rule-01012024

12 Steps of Quality Assurance

ICV/CCV – Initial Calibration/Continuing Calibration Verification

- Calibrate meter (DO, pH, ISE) or verify balance, thermometer and colorimeter/spectrophotometer
- Verify the calibration (especially if preset by manufacturer) at beginning of day and/or after every 10 readings, whichever comes first

Control Charts

- Create and maintain control charts when you have 20-30 data points

Corrective Action

- Have corrective action plan in SOP for each method on what to do if QC tests fail or are out of range
- For example, if standards fail, re-calibrate, and run test again

QC Acceptance

- Have in SOP for each method the acceptance ranges for standards, duplicates, spikes, etc. and make sure they match the method requirements.

Batch Size

- Each batch could be daily or every 20 samples (check method)

QC Frequency (depends on permit) – at least once a month

- For samples that need to be analyzed on a 5% basis (1 for every 20 samples or once per month, whichever is more frequent) follow these criteria:
 - If a permit stated that 3 analyses per week, we would allow for a duplicate to be analyzed at least once per month
 - Pick a date and be consistent, the 1st of every month or the 1st Thursday of every month. Mark your calendar!!
 - If a permit stated 5 analyses per week, we would suggest twice a month
 - Pick a date and be consistent, the 1st and 15th of every month or the 1st and 3rd Thursday of every month. Mark your calendar!!
- **Please note that influent and effluent samples count as two separate samples**

DWR–NPDES–SOP–G–12-Quick Reference for Method Update Rule-01012024
12 Steps of Quality Assurance

- **For example, if you are supposed to run 3 BODs a week, that should be counted as running 6 samples for that week**

Standard Operating Procedure

- Here’s that “13th Step,”
- All procedures must be documented in some type of SOP
- It can be very simple but must provide the information necessary for someone who is not familiar with the test to perform it
 - Step by step instructions on how and where to collect the samples, how to run the test, and how to report the values
- It must include the QC Acceptance Criteria, the definition of a “Batch”, and the minimum frequency of QC checks

Revision Number	Date	Brief Summary of Change
0	November 2013	Initial issuance of the Guidance
1	February 21, 2018	MDL section updated to reflect Revision 2 procedures
2	July 2019	Added TSS method blank requirement for MDL
3	December 2021	Method editorial revision dates

DWR-NPDES-SOP-G-12-Quick Reference for Method Update Rule-01012024
12 Steps of Quality Assurance

		updated to reflect changes to 40 CFR 136 that became effective July 19, 2021; added SM 4500-O H (2016); updated link to MDL Examples and EPA Guidance Document.
4	December 11, 2023	Updated Control Chart information, grammar, and effective date.