# QUALIFIER AND PROBLEM CODE FACTSHEET

## Qualifier Codes

**Table 1:** Qualifier codes available in the CMC Data Explorer. Only codes labeled "Field" will be available on the data upload form, all codes are available for bulk upload.

| Field/Lab | Code | Description |
|---|---|---|
| Field/Lab | < | Value reported is **less than** the method detection limit (MDL) for the equipment used to analyze the sample. Used for lab grab samples if the lab reports a value lower than the MDL or field samples like bacteria (Coliscan or R-Card) analyses. |
| Field | > | Value reported equals the upper range limit for the equipment used, but the actual reading or measurement is **greater than** this value. Used for secchi depth, turbidity tube, and bacteria (Coliscan or R-Card) readings. |

### When to use qualifier codes

Qualifier codes are used to describe cases where the value reported for a sample is less than or greater than the detection limit for the equipment used to analyze the sample.

- Less than (<) - is used for lab data, or in some cases field data (like bacteria Coliscan or R-Card samples), when the value reported is less than the method detection limit (MDL) for the associated lab and/or equipment. All labs are required to report their MDL for each parameter analyzed and this information is stored within the Data Explorer.
- Greater than (>) - is used for water clarity data (secchi depth or turbidity tube) when the reading is actually greater than the highest achievable value (ie. the secchi disk is visible on the stream bed or when the turbidity tube is filled to the top and the disk is still visible) and bacteria data when the plate is "too numerous to count" or above the upper range limit for the method (typically 2419 CFU/100mL or MPN).

### How to use qualifier codes

Qualifier codes should be associated with the water quality **value** reported for an individual parameter or data point.

- The less than (<) symbol will be automatically attached to the data if the value reported is less than the MDL recorded for that parameter and lab. The less than symbol can also be attached to the data manually during the bulk upload process or via the data upload form/edit and review process.

- The greater than (>) symbol is attached to the data manually during the bulk upload process or via the data upload form/edit and review process.
    - If the secchi disk is visible while sitting on the stream bed, the total depth should be recorded as the value with the > symbol as the qualifier code.
    - If the secchi disk is visible at the bottom of the Turbidity Tube while the tube is completely full, the highest value achievable (could be 55cm, 60cm, 115cm, or 120cm) should be recorded with the > symbol as the qualifier code.

## Who should use qualifier codes

Qualifier codes should be assigned by project coordinators during the quality assurance checks in place for their specific programs. In some cases individual monitors may include a code on the data upload form, but that code should be checked by the appropriate coordinator.

## What happens to the data after a qualifier code is used?

All qualifier codes are attached to the value reported when these data are downloaded from the Query page of the Data Explorer or submitted to the Chesapeake Bay Program and the Water Quality Exchange (WQX). There are multiple methods for handling below MDL values and each system may handle them differently.

## Problem Codes

**Table 2:** Problem codes available in the CMC Data Explorer. Only codes labeled "Field" will be available on the data upload form, all codes are available for bulk upload.

| Field/Lab | Code | Name | Description |
|---|---|---|---|
| Field | A | Calibration or Standardization failed | Must be used if a sample value is reported, but the calibration or standardization for that equipment failed. |
| Field | B | Post-sample check failed | Must be used if the sample value is reported, but the post-sample check technique for that equipment failed for specific sampling events. If the issue is chronic, data should be downgraded to a lower Tier or flagged with the "Q" code instead. |
| Field | C | Field replicate out of range | Must be used if the field replicates or duplicates for kit or probe measurements are out of range. If the issue is chronic, data should be flagged with the "Q" code instead. |
| Field | V | Other Field QA/QC issue | Must be used if any other quality assurance or quality control measures are not met. |
| Field | X | No routine sample taken - see comments | Can be used to record that a routine measurement was not taken for a specific sampling date. Should be accompanied by an explanation in the comments section. |
| Lab | D | Lab sample not preserved properly | Reported by the lab if the sample was received and not preserved (either with acid or on ice) properly. |
| Lab | E | Lab sample received after holding time | Reported by the lab if the sample was received after the appropriate holding time. |
| Lab | F | Lab sample analyzed after holding time | Reported by the lab if the sample was analyzed after the appropriate holding time. |
| Lab | G | Other Lab QA/QC issues | Reported by the lab if there is some issue with the sample (ie. not enough sample was collected, chemical interference, lab analysis issues, etc.). |
| Lab | H | Lab sample field blank failed | May be reported by the lab, but should be checked by the program coordinator when lab data is received. |
| Lab | I | Lab sample field duplicate out of range | May be reported by the lab, but should be checked by the program coordinator when lab data is received. |

## When to use problem codes

Problem codes are used to signify a quality assurance or quality control issue or concern with a specific data point so a data user can make a decision whether or not to use that data. Problem codes should be used in the following ways:

- By groups who have volunteer monitors upload their data on the data upload form and a coordinator performs the quality assurance checks at a later date to flag data that failed QA checks.
- By groups who take grab samples to a lab for analysis if the lab flags data.

Monitoring groups who bulk upload field data most likely remove questionable data prior to upload. Problem codes can be included in the bulk upload process if questionable data are included.

## How to use problem codes

Problem codes should be associated with the water quality **value** reported for an individual parameter or data point.

- The problem codes labeled “Field” can be attached to a data point via the data upload form or on the edit and review page by clicking the red circle next to the parameter and selecting the appropriate code from the drop down list.
- All problem codes can be attached to a data point via the bulk upload form by including the code in Column K “Problem” on the data upload template.

## Who should use problem codes

Problem codes should be assigned by project coordinators during the quality assurance checks in place for their specific programs. In some cases individual monitors may select a code on the data upload form, but that code should be checked by the appropriate coordinator.

## What happens to the data after a problem code is used?

Problem codes are used to alert a potential data user to a quality assurance or quality control issue with a particular data point. All problem codes are attached to the value reported when data are downloaded from the Query page of the Data Explorer or submitted to CBP and WQX. There are multiple methods for handling problem codes and each system may handle them differently.