



My data have
too many qualifiers!



Data validation is performed to ensure that environmental programs and decisions are supported by data that are of the type and quality needed, and expected, for their intended use. As a result of the validation, qualifiers are applied to the sample results so that the data user understands how precise and accurate the results are. Unfortunately, qualified data can be perceived by the data user as data of poor quality. They may think these are data in which they should have no confidence, or that the data could be unusable. The data user might even think that the number of qualifiers applied to the results is inversely proportional to the quality of the results. In most instances, this is not the case.

The goal of data validation is to provide an overall assessment of the quality of the data. As a result of the validation effort, some data may require a qualifier to indicate potential bias in the data. Qualifiers are assigned to sample results based on information such as sample integrity (condition, preservation, and holding time), quality control data, calibration data, and field data. Data validation also includes a determination, where possible, of the reasons for any failure to meet method, procedural, or contractual requirements, as well as an evaluation of the impact of such failure on the overall data set.

The most common qualifiers used during the validation process are 'U', 'J', 'UJ', and 'R'. A validator will apply the 'U' qualifier to a sample result when an associated blank (method, field, trip, equipment) contains the same analyte as the sample, at a similar concentration. The 'J' is used to alert the data user that the reported concentration is an estimate. Some EPA Regions also use 'J+' to indicate a potential high bias and 'J-' for a potential low bias. The 'UJ' indicates the analyte was analyzed for but was not detected and the reported quantitation limit (QL) is approximate and may be inaccurate. The 'R' is used to alert the data user that the data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample. These results cannot be used for any assessment or decision making.

It is possible that more than one qualifier may be added to a sample result. For example, a result may be qualified as estimated 'J-' due to low surrogate recovery and estimated 'J+' due to high recovery in the laboratory control sample. In this instance, the bias cannot be determined, and the 'J' qualifier would be applied to the sample result.

The data validation report should always explain why the data were qualified and indicate the bias direction, when it can be determined. Validated data that are not qualified are considered valid as reported and can be used without reservation at their reported numerical values.

The process of data validation and applying qualifications to sample results provides information to the data user where bias or variability exist. Except where rejected, the results are usable, however, it is up to the data user to review the qualifications on a case-by-case basis to determine if the data meet the project needs. It is important to understand that even though many qualifiers may appear on your data, it doesn't mean that the data are 'bad'.