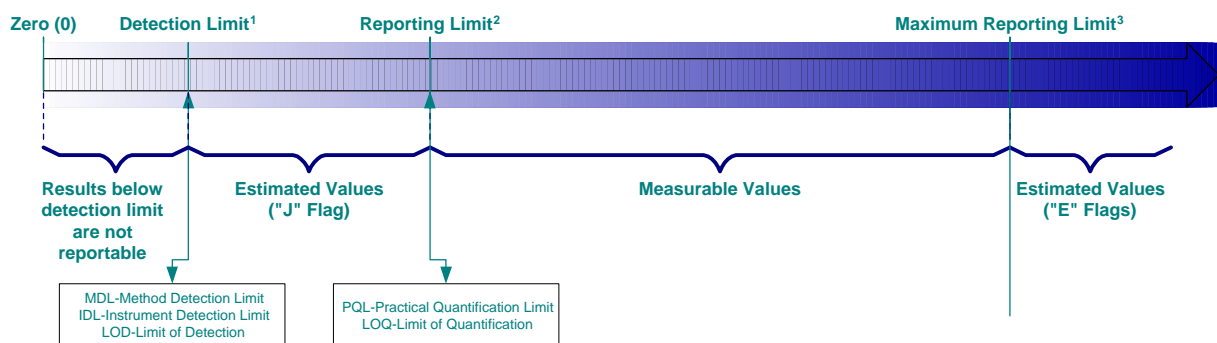


Technical Bulletin – Reporting Limits

Our experience shows that requests have been made for results that are several orders of magnitude lower than the laboratory's current reporting limits. We feel this may be due to personnel and even the regulators not truly understanding the terminology used in data reporting. To help you better understand this terminology, we have developed the following chart and definitions of data reporting terminology.



1. Detection Limit

The detection limit is the lowest result that the laboratory can report, and is also referred to as:

- MDL – Method Detection Limit
- IDL – Instrument Detection Limit
- LOD – Limit of Detection

The detection limit is defined (in 40CFR, Part 136, Appendix B) as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. In other words, the presence of the analyte can be confirmed, but the precise concentration cannot be reliably determined. Data reported between the detection limit and the reporting limit will be flagged with a "J".

2. Reporting Limit

The next range of numbers are the true measurable values – values between the reporting limit and the maximum reporting limit. The reporting limit (RL) is also referred to as:

- PQL – Practical Quantitation Limit
- LOQ – Limit of Quantitation

This is the lowest concentration that can be reliably measured (within specified limits of precision and accuracy), generally 3 to 10 times the MDL. For many analytes, the reporting limit is selected as the lowest non-zero standard in the calibration curve. The calibration curve is established by graphing the known quantity of an analyte and comparing it to the instrument response (normally for 5 points ranging from a very low concentration to a very high concentration).

Results that fall below the reporting limit will be reported as "less than" the value of the reporting limit, e.g., less than (<0.01 ug/L), BDL (below detection limit), BQL (below quantitation limit), or ND (none detected), dependent upon the laboratory's reporting format. Results that are between the reporting limit and the maximum reporting limit will be reported as the determined value.



3. Maximum Reporting Limit

Lastly, a sample concentration exceeding the high standard of the calibration curve typically requires dilution and reanalysis, but can also be reported directly with an “E” flag. When reanalyzed, the reporting limit will be raised in direct proportion to the dilution factor (i.e., a 10 fold dilution will raise the reporting limit by a factor of 10).

There are several other reasons why detection limits might change for a particular test, including:

Sample Matrix. Some samples have a simple matrix that does not cause any analytical difficulties. Other matrices are complex, containing constituents that interfere with the analysis and may result in higher detection limits. For solid samples, the amount of sample analyzed determines the final reporting and detection limits. Since it is not practical to weigh out exactly the same amount of sample for every sample in a batch, the detection limits could vary slightly within a batch of samples. Another factor that impacts reporting and detection limits for solid samples is the % moisture. Samples are analyzed wet, or "as received", but the data are reported on a dry weight basis, therefore the analytical results are corrected for % moisture. Moisture content does vary from sample to sample, and the reporting limit, expressed on a dry weight basis, will vary accordingly.

Changes in Performance of Existing Methods. There are occasions when the laboratory finds it necessary to adjust reporting limits based upon evaluation of the performance of an existing method.

If you should have any further questions or need additional information regarding reporting limit, please feel free to contact us at 800-888-8061.