



Enclosure 3: Understanding Data Packages

What is the Department of Defense QSM?

The Department of Defense (DoD) Quality System Manual (QSM) contains the underlying guidelines and requirements that labs must meet to be accredited under the DoD Environmental Laboratory Accreditation Program (ELAP). The QSM is written by the DoD Environmental Data Quality Workgroup (EDQW) and applies to labs performing work for Army, Navy, and Air Force under the Environmental Restoration Program. It specifies the minimum requirements for data quality, including analysis and reporting.

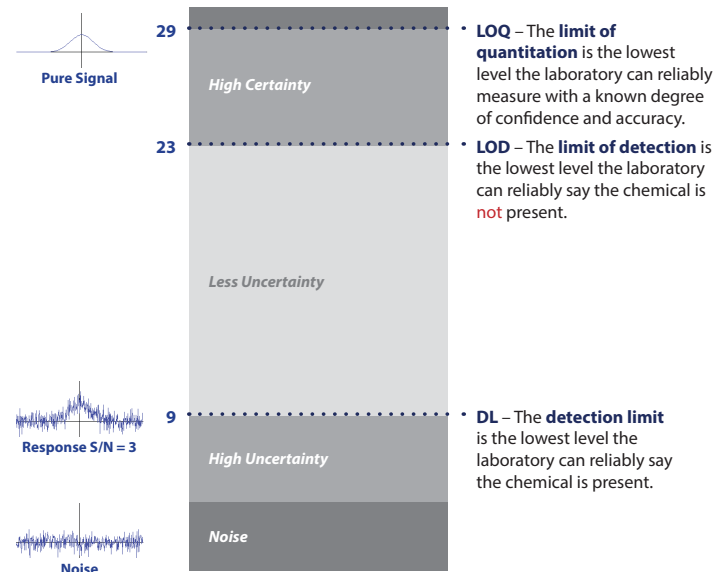
What is the difference between the detection limit and limit of detection?

The detection limit (DL, also known as the *method detection limit [MDL]*) is the lowest concentration for reliably reporting a detection. At the DL there is only a 1% chance of reporting something is there when it actually isn't present (1% chance of a false positive). **The DL is the lowest level at which the laboratory can reliably say the chemical is present.**

The limit of detection (LOD) is the lowest concentration for reliably reporting a non-detect. At the LOD there is only a 1% chance of reporting the result as not found when it actually is

present (1% chance of a false negative). **The LOD is the lowest level the laboratory can reliably say that the chemical is not present.**

Instrument Measurements



What are data qualifiers?

Qualifier	Explanation	Indicates	
		Uncertain Identity?	Uncertain Concentration?
U	Non-Detect – Chemical was analyzed for, but not “seen” above the DL.	Yes	Yes
J	Estimated Value – The reported result is an estimated value (e.g., matrix interference was observed, or the analyte was detected at a concentration outside the calibration range).	No	Yes
M	Manually Integrated – The peak on the laboratory equipment was manually, rather than automatically, integrated.	No	No
D	Diluted Sample – Sample result taken from a diluted sample.	No	No

See back of factsheet for an example of a laboratory analysis data sheet.

AFFF aqueous film forming foam
EPA U.S. Environmental Protection Agency
LHA lifetime health advisory

OLF Outlying Landing Field
PFAS per- and polyfluoroalkyl substances
PFOA perfluorooctanoic acid

PFOS perfluorooctane sulfonate
ppt parts per trillion

EXAMPLE OF LABORATORY ANALYSIS DATA SHEET

The result for PFOS:

PFOS was detected in the sample at 0.022 µg/L (0.022 ppb or 22 ppt).

The "J" qualifier means that the result detected is an estimated level.

The result for PFOA:

PFOA was detected in the sample at 0.015 µg/L (0.015 ppb or 15 ppt).

The "M" qualifier means that laboratory staff had to further verify the value the instrument produced.

The result for PFBS:*

PFBS was not detected in the sample.

The "U" qualifier means that the compound was not detected with a high degree of confidence at the LOD.

$$1 \mu\text{g/L} = 1 \text{ ppb} \quad 1 \text{ ppb} = 1,000 \text{ ppt}$$

$$\text{microgram(s) per liter} \quad \text{part(s) per billion} \quad \text{part(s) per trillion}$$

$$0.010 \mu\text{g/L} = 0.010 \text{ ppb} = 10 \text{ ppt}$$

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.:

SDG No.:

Client Sample ID: WI-CV- -1116 Lab Sample ID:

Matrix: Water Lab File ID:

Analysis Method: 537 Date Collected: 11/28/2016 16:59

Extraction Method: 537 Date Extracted: 12/02/2016 07:42

Sample wt/vol: 267.2 (mL) Date Analyzed: 12/07/2016 22:25

Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1

Injection Volume: 10 (uL) GC Column: Acquity ID: 2.1 (mm)

% Moisture: GPC Cleanup: (Y/N) N

Analysis Batch No.: 140946 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.022	J	0.056	0.045	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.015	J M	0.028	0.022	0.0088
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.10	0.045

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	114		70-130

This column identifies the data qualifiers that apply to a given result.

The limit of quantitation (LOQ) is the lowest level at which the laboratory can reliably measure this compound with a known degree of confidence and accuracy.

The limit of detection (LOD) is the lowest level at which the laboratory can reliably "see" this compound is **not** present.

The detection limit (DL) is the lowest level at which the laboratory can reliably "see" that this compound is present.

* There is not a health advisory level for PFBS; therefore, no action is currently being taken based on this result. This chemical has health effects information that can be used to evaluate potential impact under the Navy's Environmental Restoration Program.