

The Impact of Professional Judgment to Final Data Usability

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Why worry about professional judgment?

Typical language from a QAPP:

Laboratory analytical data packages will be validated in accordance with the EPA National Functional Guidelines (NFG) for Inorganic Superfund Data Review (EPA540-R-10/011, January 2010) and the EPA NFG for Superfund Organic Methods Data Review (EPA540/R-07/003, June 2008).

Professional Judgment

“Professional Judgment” is cited 361 times in the 2014 Organic NFG!

48 times for trace VOA
54 times for 'regular' VOA
61 times for SV
110 times for pesticides
87 times for Aroclors

“Professional Judgment” is cited 253 times in the 2014 Inorganics NFG

The number of citations typically increases with each new version of NFG

For Organics:

1994	108 citations
1999	104 citations
2005	203 citations
2008	266 citations
2014	361 citations

Maybe that's why they call it
"GUIDELINES"

Language from 2014 NFG introduction:

Limitations of Use:

“This guidance is specific to the review of analytical data generated using CLP SOW SOM02.2.”

Language from 2014 NFG introduction:

Limitations of Use:

“While this document is a valuable aid in the formal data review process, other sources of guidance and information, along with professional judgment, are useful in determining the ultimate usability of the data. This is particularly critical in those cases where all data do not meet SOW-specific technical and QC criteria.”

Sections of NFG with Significant PJ Calls

- ▶ Sample Handling
- ▶ Instrument Tuning
- ▶ Calibrations
- ▶ Method Blanks
- ▶ Surrogates
- ▶ MS/MSD
- ▶ Compound Identification
- ▶ System Performance

What about the LCS section?

For GCMS analyses, NFG has not included LCS since 1999!

How can professional judgment affect my data?

Sample Handling (Preservation and Holding Times)

- ▶ If samples are received with shipping container temperatures $> 6^{\circ}\text{C}$, use professional judgment to qualify detects and non-detects.
- ▶ If samples are received with shipping container temperatures $> 10^{\circ}\text{C}$, use professional judgment to determine the reliability of the data

Instrument Tuning

- ▶ If the ion abundance criteria are not met, use professional judgment to qualify detects and non-detects in the associated sample

Initial Calibration

Use PJ to:

- ▶ Potentially reject all data if frequency requirements are not met
- ▶ Potentially reject detected results associated with a low RRF value
- ▶ Decide whether to qualify non-detects associated with a %RSD outlier
- ▶ Decide whether an outlier is 'ok' if you throw out the high or low point

Continuing Calibration

Use PJ to:

- ▶ Potentially reject all data if frequency requirements are not met
- ▶ Potentially reject detected results associated with a low RRF value
- ▶ Potentially qualify all data if an inappropriate concentration is used
- ▶ But no discussion of NOT estimating non-detects if a high bias is noted!

Blanks

Blanks: Comparison to CRQL

Blanks

- ▶ There may be instances where little or no contamination is present in the associated blanks, but qualification of the sample is deemed necessary

Blanks: Trip, Field, Rinsate, Wipes

- ▶ Association with field samples
- ▶ Hierarchy of blanks
- ▶ Application of aqueous blank to other matrices

Surrogates

- ▶ System Monitoring Compounds (GCMS 1994)
- ▶ Deuterated Monitoring Compounds (GCMS 2005)
- ▶ Surrogates (other organics)

Surrogates

- ▶ VOA
 - ▶ 1994 NFG: 3 (or 4) SMC
 - ▶ 2014 NFG: 13 DMC
- ▶ SV
 - ▶ 1994 NFG: 3 acid and 3 BN SMC
 - ▶ 2014 NFG: 17 to 19 DMC

MS/MSD

- ▶ If MS/MSD samples are not analyzed at the specified frequency, use professional judgment to determine the impact on sample data

MS/MSD

- ▶ What analytes were spiked?
- ▶ What control limits should be used?
- ▶ How do actions apply to unspiked analytes?

Compound Identification

Etc., etc., etc. – Yul Brynner

- ▶ System performance/degradation
- ▶ % solids – qualify if < 30%
- ▶ Impact of cleanups
- ▶ Retention time shifts
- ▶ Method specific QC

Take Away

- ▶ National Functional Guidelines are...guidelines
- ▶ NFG applies only loosely to SW846 and/or other programs
- ▶ PJ calls should be based on experience and expertise, because
- ▶ PJ calls can have a major impact on your reported results!
- ▶ PJ calls should be documented by the validation firm to ensure consistency and defensibility

Do you know what your validator is doing?

Do they?

A Fond Farewell

Thank you for attending my presentation...Questions??

My attendance at this conference is, in a way, my personal retrospective of 30+ years in the Environmental Quality industry. Thanks to all of my colleagues, friends and competitors for a interesting and challenging career.

Next up...a career in wine and food.

