NACRW Reference Material Guide for Trace Level Analysis

and Multi-residue Mixes

**Guidance Document Draft Outline**

**Revised June 25, 2020**

Title: Best Practices for Use and Handling of Reference Materials

1. Introduction
   1. Scope (Jo Marie C.) **Melissa review** - **Ready for Review!** 
      1. Family of RMs and diagram
      2. What are you trying to accomplish?
         1. Prepare RMs for profit?
         2. Testing - Enforcement?
         3. Testing - Monitoring?
         4. Testing - Research?
      3. What types of standards are you using?
         1. Purchased
         2. Prepared in laboratory
   2. Manufacturer/Producer Requirements (Markus O., Pat) **Melissa review** – **Ready for Review!** 
      1. ISO 17034
      2. ISO 17025
2. Glossary of Terms (Melissa P. & working group, Hakan & Rick Jordon reviewer, ) **Ready for Review!**
3. RM & CRM Handling Tips (Francesca M.) **Ready for Review!** *Joe Reviewing*
4. Reference Material Documentation (Joe K. & Francesca M.,) Melissa & Marcus O to review

*In final updates*

1. Starting Material Characterization (Patti A. w/ Kathy S.) **Ready for Review! Mario S. to Review**
   1. Traceability
   2. Purity
   3. Identity
   4. Isomers (call out awareness, but not in-depth description) note: possible tech note resource.
2. Stability (Kelly D. (c,d,f) & Alex K. (a,b,e) **Ready for Review!**  **Jon W**, **Mario S. to Review** – **Marcus O to review**
   1. Neat
      1. Acceptance criteria
   2. Individual stock standards:
      1. pH and solvent selection considerations
      2. Hydrolysis/oxidation potential (after opening)
      3. Challenging/reactive compounds
      4. Acceptance criteria
   3. Multi-component standards:
      1. precursors and breakdown products (appropriate combinations)
      2. Hydrolysis/oxidation potential
      3. Detection systems (UV vs MS)
      4. Acceptance criteria
   4. Matrix Reference Materials (defined in glossary)
      1. Stability/interactions (metabolism, degradation after application of pesticide on crop/stored grain)
   5. Matrix-matched standards (defined in glossary as Matrix Spike)
      1. Matrix/analyte interactions
      2. Solvent/pH considerations
      3. Detection systems (UV vs MS)
      4. Acceptance criteria
   6. Stability studies
      1. Stability validation – demonstrate acceptance criteria
3. Expiration (Kyle H.) **Jon review**- **Ready for Review!**
   1. Requalification/Recertification
   2. Responsible re-use
   3. SANTE Guidelines
   4. Disposition
4. Preparing In-House Reference Materials (Jo Marie) **Ready for Review!**   **Pearse agreed to review**
5. Application & Use of RMs (Kate M., Alex & Jo) *To be completed by July 3*
   1. Calibration vs. Incurred
      1. Solvent-based
      2. Incurred in Matrix
   2. Method Development & Performance
   3. Method Validation
   4. Method Expansion
   5. Qualitative vs. Quantitative Analysis
   6. QC Check or Verification
   7. Identification
   8. Method Comparability

(Kate will send her presentation on this topic)

1. Second Source Reference Materials (Jo Marie C) **Ready for Joe to review!** 
   1. History
   2. Definition
   3. How to Use
2. Measurement Uncertainty (Marcus O. and Katerine S.) **Ready for Review!**  - **Hakan Agreed to review**

(NIST guidance docs on measurement uncertainty posted on RMWG page)

* 1. NIST Guidance Resources
  2. Reference Material Provider Resources
     1. Patti – SPEX White Paper (posted on RMWG Web Page)
     2. CoA definitions, equations
  3. Stressed vs. unstressed Uncertainty

1. Troubleshooting *(add as a new chapter in 2021)*
2. FAQ (*add as a new chapter in 2021)*

Reference Documents (All Authors) – *To be included with each Chapter*

* 1. Note references in your draft sections using first author name and date
  2. List references at the bottom of your draft document using our standard format

All authors should add whatever references they feel are appropriate for their chapters.  This is a guide and so extensive references are not expected; only those that the readers should definitely need for their work.  We want to standardize how references are formatted by Author and date first.

* The citation in the text will be author and date.  ( *Phillips 2013)*
* For example: Authors (date) Title, Journal vol:pages

Phillips MM, Sharpless KE, Wise SA (2013) Standard reference materials for food analysis, Anal Bioanal Chem 405:4325–4335

APPENDIX

A1: List of Reference Material Providers (may be added 2021)