

## Radiochemistry Expert Committee (REC) Meeting Summary

January 28, 2014

### 1. Roll Call and Minutes:

Bob Shannon, Chair, called the meeting to order at 8 am EST in Louisville, KY. Attendance is recorded in Attachment A – there were 10 members present. Phone: Ariana Mankarian - associate (morning/afternoon), Vas-member (morning/afternoon), Ron Houck –associate (morning/afternoon), Terry Romanko - associate (afternoon), and Carl Kircher – associate (late afternoon). Yoon Cha, associate member, attended the meeting in Louisville, KY.

The January 15, 2014 minutes will be reviewed at the February meeting.

Associate members need to let Bob and Ilona know they own a copy of ISO 17025 so they can be included in distributions of the draft working standard updates.

### 2. Email Regarding Batching

Bob received an email from Michael Kitto on December 10<sup>th</sup> that he forwarded to the committee with the agenda.

There are a few points to consider:

- With gamma spectrometry there have been some discussions about what QC means. Are they representative of what is happening with the samples?
- What do you do when you have a very long batch? If a batch is daily, what do you do when you are counting a sample for two days? Are daily checks appropriate? How do backgrounds and batches relate?
- With Sr-89/90 the test has to happen quickly.

This was provided to give people something to think about as the sections are reviewed today. This will continue to be a struggle.

Richard pointed out that there are preparation batches and analysis batches. They are not necessarily the same. Richard does not think there is a difference between how Chemistry views batches and what happens in Radiochemistry. He does agree that gamma spectrometry is a unique challenge and this is what should be looked at – not spending time redefining the term “batch”.

Marty noted that it is important to bracket - QC at beginning and end. Bob commented that this is not something that has gone into the standard.

Bob would like to see if Paul Junio can join the meeting and discuss the possibility of being able to leave batches open in Radiochemistry to avoid a lot of extra QC that is not really beneficial. If all samples have to be processed in 24 hours to be a batch – this creates a lot of additional QC. In gamma spectrometry there is minimal processing of samples before analysis – so perhaps there are some options that can be considered.

### 3. Working Draft Standard

The committee has worked through the entire standard at this point. Bob would like to have the document done in April in order to have comments to review in August.

There is a lot of cleanup that needs to be done. Bob would like to increase the frequency of meetings if needed in order to meet an April time frame for a Working Draft Standard. Everyone is willing to do this if needed.

Bob put all the changes that have been made into a copy of the standard (Base Document) and distributed it to the committee members. He also forwarded an original copy of the standard. This will be reviewed during the afternoon in small groups.

Richard commented that the committee needs to have rationale for changes made to the standard.

### 4. Standard

#### Revised Text – Section 1.7.1 Backgrounds (Tom, Vas and Bob)

Tom provided an update to Section 1.7.1 that Bob forwarded by email.

1.7.1: Tom pointed out some concerns about the text regarding more stringent methods. Others agreed it is not clear. The conclusion was to delete “or regulation” and add “regulation or a contractually mandated method”. The sentence will now read: If more stringent standards or requirements are included in a regulation or a contractually mandated method, the laboratory shall demonstrate that such requirements are met.

A hierarchy is developed to make it clear which requirements must be followed.

After additional discussion it was decided to point to Module 2, 5.9.3 c): The quality control protocols specified by the laboratory’s SOP shall be followed (see Section 4.2.8.5 in this Standard). The laboratory shall ensure that the essential standards outlined in Technical Modules or mandated methods or regulations (whichever are more stringent) are incorporated into their method manuals. When it is not apparent which is more stringent, the QC in the mandated method or regulations is to be followed.

Tom noted that he corrected multiple typos. The document will go through a thorough review before it is published as a Working Draft Standard.

1.7.1 e):

There was discussion about contamination checks and whether this is adequately addressed in the standard. Keith had brought up a concern about the need to run a check after a very high sample is analyzed. It is somewhat covered in 1.7.1 e) 1) iv) and v). It was concluded that Section 1.7.1 e) v) may be more appropriate in the intro section or the checks sections. This will be looked at.

Comments today will be considered and an update will be provided for the February meeting.

Revised Text – Section 1.7.2.1 and 1.7.2.2 – Positive and Negative Controls (Carolyn, Marty and Bob)

1.7.2: The first paragraph should reference Module 2, 5.9.3 c) as discussed above.

1.7.2.2 (f) a):

A new section a) was added: For methods that measure gross activity (e.g., gross alpha/gross beta), appropriate surrogate analytes shall be used. This will generally be the radionuclides used to calibrate the detector.

1.7.2.2 (f) b):

The old section a) was changed to section b) with the following changes: When multiple individual radionuclides are determined simultaneously by alpha spectrometry, with a single measurement and calibration, only one of the analytes/isotopes needs to be included in the LCS at the indicated activity level (see 1.7.2.2 d) above).

1.7.2.2 h): Bob added a comment to look at whether requirement for uncertainty needs to be referenced.

1.7.2.1: Negative Control

Tom noted that in this section the procedures are very specific. This is not done in other sections. It should be consistent. He thinks some of this should be moved to section 1.7.3.

1.7.2.1 d) a): This section should be rephrased to make the point of the requirement clearer as opposed to the mechanics of setting up the control limits.

Section 1.7.2.3 (Nile, Vas and Caroline)

The title of this section was changed to: Samples Specific QC Measures.

First paragraph:

Comment: Evaluate language with regard to the procedures that would be required at the laboratory – a specific procedure or quality manual.

To keep the language consistent with the title of the section, “matrix” and “samples” were deleted and the following language was substituted: These procedures relate to the analyses of specific quality controls (QC) and are designed as data quality indicators for a specific sample using the designated method.

The last sentence regarding homogeneity was deleted.

Second paragraph: Delete “matrix” and substitute “sample” specific QC. Perhaps the first and second paragraphs can be combined into one introductory paragraph.

1.7.2.3 a) i): Richard commented that in Chemistry the impact of a matrix spike is only on that sample and not on the entire batch. The data user needs to determine if a matrix spike issue has any impact on other samples in the batch. The lab does not do this.

1.7.2.3 a) ii): It was commented that the text in the last sentence is already covered in the introduction. Is text needed?

1.7.2.3 a) iv): Bob pulled up the definition of matrix spike in EL-V1M2. He is not sure there is anything that this committee needs to add in this section.

Bob and Yoon Cha: When does geometry play a role in matrix spike?

The conclusion was to remove iv) and leave v).

Roman numerals i) – v) will be simplified into two points.

1.7.2.3 a) vi): OK

1.7.2.3 a) vii): Marty thought the section where this is discussed in the standard should be referenced here.

1.7.2.3.a) viii): OK. It was commented that spiking at the same level decreases the number of variables and one can see if there is a matrix effect.

1.7.2.3 a) ix): Traditionally MS spike limits are wider than LCS. The lab needs to establish criteria and have a basis for it. Text remains as e-mailed.

1.7.2.3 a) x): The question mark is to remember that the corrected reference needs to be made after the referenced section is complete. Text remains as e-mailed.

1.7.2.3 a) xi): Bob asked where the subsampling happens in the process. Matrix spike should happen prior to chemical processing of the sample. Could use the term aliquoting instead of sub-sampling. This change was made. Add “ashing” to the examples.

Add: "The matrix spike shall be prepared by adding a known activity of target analyte prior to performing any processes that will affect the analyte of interest." This will replace the sentence containing the change to aliquot.

Nile commented that this entire section will be updated and resubmitted to the committee.

1.7.2.3 b): The title was changed: Matrix Duplicates / Matrix Spike Duplicates / LCS Duplicates

Marty asked about the difference between replicates and duplicates. TNI generally uses the term replicate. Marty uses the terms differently.

The text below will need to be reviewed to replace "replicate" with "duplicate" as appropriate.

1.7.2.3 b) i): Change replicate to duplicate.

1.7.2.3 b) ii): Replace "replicate".

1.7.2.3 b) iii): OK

1.7. 2.3 b) iv): Replace "replicate".

1.7.2.3 b) v): OK

1.7.2.3 b) vi): Replace "replicate".

1.7.2.3 c):

Second paragraph: Consider that tracers may only be available that introduce bias. Require that the final result be unbiased or that there is an exception.

Third paragraph needs to be revised similarly to above. Clarify subsampling.

Fifth paragraph: Need to go back to LCS language change as above. Use measurement quality objective. We want to use the more general term. Also need to look at whether this has already been covered.

Lunch Break

#### Batch Discussion

Paul Junio (Chair – Quality Systems Expert Committee) was able to step in to the meeting. He was asked to discuss the definition of batch and how it relates to Radiochemistry. Bob explained the issue with batch and gamma spectrometry. He noted that there is no chemical preparation that occurs. How can a batch be set-up that might

allow the addition of samples at greater than 24 hours. This is also an issue when there are long count times that are beyond a day too.

Paul: If there is no preparation involved, this can be viewed exclusively as an analytical batch and there is no batch size or timing issues. He asked why there is a benefit to keeping the batch open. It was explained that sample counts may be long and it may be critical to get a sample analyzed as quickly as possible – but waiting for completion of a batch could delay reporting data. If QC needs to be run for each batch, this competes with time to run the samples quickly. Labs with multiple instruments can better accommodate this, but not all labs have this capacity.

Paul noted that it appears that for gamma spectrometry there is not really an LCS. It is more like a verification of the calibration. *[Bob noted that the “LCS” is specific to the geometry being counted and tests the library and other instrument parameters].* Generally, one MS, one sample duplicate, one LCS, and one Method Blank are needed per batch. Since MS are not required for gamma spectrometry, this would be one duplicate, one LCS and one Method Blank. Larry noted that a bracketing definition would work for gamma spectrometry. The committee would have to define how much time can pass before a batch is closed, how many samples can be run and how to manage different geometries and instrument configurations. Also need to consider blanks when working on this definition. Would the “batch” be bracketed by an opening and closing LCS and Blank?

Terry noted that a commercial lab preps as many samples as possible in a prep batch and then runs them on multiple instruments. He asked if this analytical batch approach would require that all the samples and QC for a batch would be on the same instrument. Bob thought the idea is correct, but language needs to be worked on. An LCS has to represent the matrix that is being analyzed.

Richard had some additional questions. Is it per detector or per detector type? How does this relate to the gas proportional counters? The committee has not talked about running the LCS on every one of the gas proportional counters at a lab, so is this appropriate with gamma spectrometry? Bob agreed that it might not be detector specific. One set of controls is run to show the instrument is functioning and another set to show the sample batch is passing.

Tom asked if this batch concept could be extended to other types of analyses that don't have a chemical preparation – such as gas proportional counters. Paul Junio noted that everyone needs to remember that a lab must follow the most stringent requirements if a method is more stringent.

Bob would like to look at the Drinking Water Certification Manual to confirm there are no issues with making the changes discussed above. Someone in the audience read the appropriate text that should be considered. Larry also noted there is some specific text for gas proportional counting that would be appropriate to review. Bob will distribute this language to the committee members for consideration.

Marty commented that there is always preparation that has to be done to get the sample on the instrument. He thinks you can't eliminate a preparation batch. Contamination can still be introduced during this instrument loading process.

Terry noted two concerns:

- analytical batch needs to be clearly defined. This definition should include whether multiple detectors can be used or just single.
- and who has had a gamma detector that has changed characteristics for one geometry but not affected any other geometry?

Bob responded that Carolyn and Tom will work on the definition. Larry reminded everyone that it is already defined in Module 2. The second question - it can happen at low energies more than expected. We are looking at the overall system – not just if the detector is stable. Tom noted that a wrong library could be mistakenly used and a random LCS may not catch this. Terry is asking if this is appropriate. Bob feels you have to keep it in perspective and look at how QC is handled in general.

Carolyn and Tom will prepare draft language to address the discussions above. It is more than a discussion about preparation vs analytical batch. All QC and calibration text needs to be considered.

#### (Con't) Section 1.7.2.3 (Nile, Vas and Caroline)

1.7.2.3 d): The requirements need to be itemized similarly to the Tracer section above.

Tom commented that “for yield determination” cannot be crossed out.

Carolyn wanted to be sure that specific limits are not set in the standard for the yield recovery. Marty also noted that consideration has be given to whether it is being looked at through gravimetric means, ICP, etc ...

#### Section 1.7.2.4 and 1.7.2.5 (Larry)

Bob distributed this information within the Base Standard Update he distributed prior to the meeting.

This is the same language developed after San Antonio. Larry briefly described these original changes.

Bob commented about 1.7.2.4 b) – should MDL be deleted and just have critical level? Yes.

There was still agreement with what was in the text for these sections. No further changes needed.

### Section 1.7.3 (Larry, Dave and Terry)

The title of the section was changed to Data Evaluation and Reporting. Tom commented that the entire section needs to be reevaluated for use of “shall” instead of “are” and “is”.

Section 1.7.3.2 d): “Should” needs to be changed to “shall”. Richard also suggested looking for similar language regarding reanalysis in the Chemistry section. This wording may be helpful in this section. Bob also reminded people that the lab has procedures for dealing with QC failures. Intent will be clarified in the language.

Section 1.7.3.3 a) and a) i): “Replicates” needs to be replaced with “duplicates”.

Section 1.7.3.3 b) i): Need to include chemical yield uncertainty - For alpha spectrometry, evaluation of tracer acceptability also includes evaluation of chemical yield uncertainty, peak resolution measures, such as peak width at one-half peak height (FWHM).

Need to include a Section 1.7.3.4 – Evaluation of Sample Results. Check key parameters such as required MDCs, uncertainty to ensure that MQOs have been met.

There were a few spelling and grammatical changes also made. Section numberings will be corrected in the final version.

This section will be edited based on comments and presented in February.

### Section 1.7.4 (Marty, Bob)

Carolyn asked if thermal preservation is needed for radon in water. There should be no air in the vial and this eliminates the need for thermal preservation. If there is an air bubble – there would be a problem. Thermal preservation is part of the method and requirements will be documented there.

Bob and Marty thought this requirement should be struck and wanted to hear from others what they thought should be in this section. Others thought there should be a sample handling section and it should state at a minimum that any requirements for sample preservation are specified by the method. Any method specified requirements for sample handling and preservation shall be adhered to and corrective action will be taken where there are issues. This would also cover pH.

Richard commented that he thinks more of the original text should be left in. It is not sufficient to refer to the method. Deleting all the text would be a consistency issue with the rest of the TNI standard.

The following notes were captured for the original language after further discussion:

1.7.4 a): All samples requiring ... acceptable if the temperature is within the required range. Don't put specific degrees. Keep i). Keep b) but add in thermal preservation "prior to analysis".

1.7.4 b): Address drinking water or other regulatory requirements.

This section will be updated and reviewed during the February meeting.

### Small Group Reviews

The committee broke into small groups to review and discuss the changes made to the standard that Bob distributed to the committee members prior to the meeting. He also had some hard copies available. Associates and members on the phone were also encouraged to review the standard and provide comments to Tom. Everyone was asked to forward comments on the standard up to the beginning of section 1.7 to Tom will collate them for the February meeting. These summaries are due to Tom by March 7, 2014. People were asked to look at the changes, look for consistency, look for gaps, etc ...

#### 4. Brief Status Report on Laboratory PT Expert Committee

Joe Purdue was not available to give a report and this will be done at a later meeting instead.

#### 5. Action Items

A summary of action items can be found in Attachment B.

#### 6. Next Meeting and Close

The next meeting is scheduled for Wednesday, February 26, 2014 at 1pm EST.

A summary of action items and backburner/reminder items can be found in Attachment B and C.

The meeting was adjourned and ended at 5pm EST.

**Attachment A**  
**Participants**  
**Radiochemistry Expert Committee**

Members	Affiliation		Contact Information	
			Phone	Email
Bob Shannon (Chair) <b>Present</b>	QRS, LLC Grand Marais, MN	Other	218-387-1100	<a href="mailto:BobShannon@boreal.org">BobShannon@boreal.org</a>
Tom Semkow (Vice Chair) <b>Present</b>	Wadsworth Center, NY State DOH Albany, NY	AB	518-474-6071	<a href="mailto:tms15@health.state.ny.us">tms15@health.state.ny.us</a>
Sreenivas (Vas) Komanduri  <b>Present - Phone</b>	State of NJ Department of Environmental Protection  Trenton, NJ	AB	609-984-0855	<a href="mailto:Sreenivas.Komanduri@dep.state.nj.us">Sreenivas.Komanduri@dep.state.nj.us</a>
Marty Johnson  <b>Present</b>	US Army Aviation and Missile Command Nuclear Counting  Redstone Arsenal, AL	Lab	865-712-0275	<a href="mailto:Mjohnson@tSC-tn.com">Mjohnson@tSC-tn.com</a>
Dave Fauth  <b>Present</b>	Consultant  Aiken, SC	Other	803-649-5268	<a href="mailto:dj1fauth@bellsouth.net">dj1fauth@bellsouth.net</a>
Carolyn Wong  <b>Present</b>	Lawrence Livermore National Laboratory  Livermore, CA	Lab	925-422-0398	<a href="mailto:wong65@llnl.gov">wong65@llnl.gov</a>
Keith McCroan  <b>Absent</b>	US EPA ORIA NAREL,  Montgomery AL	Lab	334-270-3418	<a href="mailto:mccroan.keith@epa.gov">mccroan.keith@epa.gov</a>
Todd Hardt  <b>Present</b>	Pro2Serve, Inc.  Oak Ridge, TN	Other	865-241-6780	<a href="mailto:HardtTL@oro.doe.gov">HardtTL@oro.doe.gov</a>
Nile Ludtke  <b>Present</b>	Dade-Moeller and Associates  Oak Ridge, TN	Other	865-481-6050	<a href="mailto:nile.luedtke@moellerinc.com">nile.luedtke@moellerinc.com</a>
Larry Penfold  <b>Present</b>	Test America Laboratories, Inc; Arvada, CO	Lab	303-736-0119	<a href="mailto:larry.penfold@testamericainc.com">larry.penfold@testamericainc.com</a>
Richard Sheibley  <b>Present</b>	Sheibley Consulting, LLC	Other (Former AB)	651-485-1875	<a href="mailto:RHSHEIB111@yahoo.com">RHSHEIB111@yahoo.com</a>
Ilona Taunton (Program Administrator) <b>Present</b>	The NELAC Institute	n/a	828-712-9242	<a href="mailto:Ilona.taunton@nelac-institute.org">Ilona.taunton@nelac-institute.org</a>

**Attachment B**  
**Action Items – REC**

	<b>Action Item</b>	<b>Who</b>	<b>Target Completion</b>	<b>Actual Completion</b>
34	Distribute Drinking Water Certification Manual to committee.	Bob	1/31/14	1/31/14
35	Review standard through Section 1.7 and get comments to Tom.	All	2/12/14	2/26/14
36	Provide Tom with your summary of comments on standard through the end of Section 1.6.	All	3/7/14	
37	Prepare summary of comments on standard through Section 1.6.	Tom	3/21/14	

**Attachment C – Back Burner / Reminders**

	<b>Item</b>	<b>Meeting Reference</b>	<b>Comments</b>
1	Update charter in October 2014	n/a	
2	Issue of noting modifications to methods.	1/16/13	
3	Look at batching when QC is looked at.	1/16/13	
4	Look at need to reference year for any standard references– which version is being referenced. Is this necessary?	5/22/13	