Radiochemistry Expert Committee (REC)
Meeting Summary

August 22, 2018

1. Roll Call and Minutes:

Bob Shannon, Chair, called the meeting to order at 1pm Eastern on July 25, 2018 by teleconference. Attendance is recorded in Attachment A – there were 7 members present. Associates: Sherry Faye, Keith McCroan, Greg Raspanti and Pepa Sassin.

Meeting minutes are distributed by email for comment/revision for a week and then posted on the TNI website. There has been a delay on the February minutes due to a recording issue, but these will be distributed within the week.

Bob reminded people that there is committee training available to committee members: http://nelac-institute.org/eds/download/ChairTraining.php

2. Module 6 Checklist

Bob received the information from Robert and Greg and has started working through it. Bob hopes to finish this in October and then send it to the Committee for review.

3. PT Acceptance Criteria

A number of emails were sent to provide information for today's discussion on PT Acceptance Criteria. The emails below and the information in Attachment E were reviewed during the discussion.

Bob started with review of the Concerns about Data email below. There were ~27,000 points in the database. Bob reviewed the text with the Committee.

Email 8/21/18: Concerns about existing data and possible approach to moving forward

A start on information to the PT committee might include:

Pointing out that we have identified several issues.

- PT Providers are not managing the data being provided to TNI in a manner that ensures that acceptance criteria for regulated parameters based on historical results will be generated using a well-controlled data set. The PT committee should consider modifying the database to ensure that only compliant data are reported and used when

evaluating acceptance. The inclusion of non-representative data should invalidate acceptance criteria based on historical results.

- Unrecognizable, inaccurate and ambiguous method references are reported. For example:
  - SM 7110 could refer to multiple methods
  - EPA Method 901 or 903 is ambiguous.
  - The following methods are associated with Ra-226:
    - EPA 903 (which method?)
    - SM305 (which method?)
    - EPA 9315
    - SM 7500 Ra M (which method? and modified)
    - SM7500Ra B (M) (modified)
    - EPA600/4-75-008 (which method?)
    - Alpha Spec
    - CoPrecipitation
    - EPA 903.1,900.1
    - Emanation
    - 7500 (which method?)
    - Alpha
    - Alpha Spectra
    - Alpha Spectrometer
    - Blank
    - 903
    - Degassing method
    - EPA 903.1 Mod
    - EPA 904.0
    - EPA 903.1 GA
    - EPA600/4-15-08
    - ISO-RAEPA-R007
    - Ba Coprecip
    - SOP 5-9 V2
    - EPA 200.8
    - EPA 9310
    - HASL 300 U-02
    - ASTM D3972
    - D3972-02
    - Ra226/Ra228
    - EPA 908.1
    - SOP 5-9
    - Gamma Spec
    - Internal
    - LSC
    - ICPMS-Ra
    - Ba precip/alpha
    - Manifold LSC
    - MnO2 Alpha

        - SM7500RaA&Cmod.
        - Gamma-ray HPGE
        - MnO2 separation
        - Radium Method
        - SEM.MO045
        - ISO13165-1
        - SOP L-5-9
        - SM3125B-2009
        - Ra
        - ICPMS METHODS
        - in house
        - ICP-MS Ra
        - MnO2 Separation/micro precip/alpha spec
    - Results are included that could not have been run using the reported method.
        - Ba-133 cannot be determined using EPA 901.0 which employs a specific chemical separation for cesium.
        - I-131 by EPA 901.1 reasonably refers to non-destructive gamma spec whereas EPA 901.0 is a chemical separation for Cs that cannot work for radioiodines.
        - There are too many similar cases to list here.
    - Methods listed as modified are included – there is no way to know how the method was modified and what impact that would have on results.

I will provide my cross-reference of method codes and associated methods and my write-up. *(Sent by email on 8/22/18).*

- TNI Method codes are assigned inconsistently
    - Multiple TNI method codes are assigned to a single analyte/method by different PT providers
        - e.g. Ba-133 vs. BA133
    - Methods that deliver very different quality data are being assigned a single code.
        - For example, a single method code for Ra-226 (2965) is associated both with definitive measurements (deemanation and gamma spec) and screening measurements.
        - Uranium is assigned to a couple of codes. This deserves some thought but at very least atom counting should be compared to atom counting and activity to activity.

Then we should describe Keith's proposed approach and how it performs relative to the previous approach and show examples of old vs. new.

- Big picture, the proposed approach is sensitive to MQOs, which helps ensure that labs are being tested based on whether their methods are capable of delivering data that is of quality sufficient to support intended decision making.

We should point out that in several cases, the proposed change will result in a significant fraction of previously acceptable results being now classified as unacceptable – sometimes as many as one in four.

- This might be due to presumed MQOs obtained from EPA.
- This might be due to problems with methods
- This might impact only a subset of labs who are less proficient at running methods. Or is might impact all, equally, if it is the method that is deficient.

Additional Discussion during Meeting

Bob emphasized there's a lot of data grouped together not using approved methods and this needed to be corrected.

There are real questions with use of historical data.

Keith then discussed his approach (see Attachment E). He reviewed the information in the attached document and then showed the graphs also included in Attachment E. He explained the red line shows the new lower and upper limits and the green shows the old limits. The black dots show actual historical data.

The new limits for gross alpha would accept some of the higher data points that were rejected before and reject some of the low end points that were accepted before. He reviewed each of the charts. Some charts had similar limits and others showed changes. Some of the changes might cause more failures. The gamma emitters results would usually pass.

Vas asked about Tritium and Cesium. Do they line up well because the techniques have low variability? That could be the reason. The more complex or difficult the steps are in the methods the more variability that can be introduced.

Tom noted that for Cesium, all the data passed. Is this what we want? Shouldn't there be some failures? Doesn't this degrade the program? Bob asked why the limits should be tightened if the requirements are being met? Bob and Keith do plan to talk to EPA about this.

There was less guesswork at the bottom end of the limit and more at the upper end. This is one of things that want to talk to EPA (Glenda) about next week.

In TNI the emphasis is towards the DW work, but this Committee focused on writing Module 6 so that it was not limited to DW since labs are being accredited for parameters beyond DW. This PT Limit approach may help open the door towards labs getting PTs for work beyond just DW.

Bob asked if committee members leaned towards MQOs or historical PT data? The historical data is very sloppy.

Vas noted that he finds it interesting that the old limits don't look as bad as he expected based on the issues presented above. Bob said this makes sense since the labs have to run methods that do at least meet QC criteria.

Bob asked Vas if he is concerned an MQO approach could be too restrictive? He pointed out that labs should pass PTs if their system working well enough to pass program MQOs. This is probably in favor of the MQO approach.

In the future the group could look at using incorporating an approach that uses the uncertainty of the results to set limits. Then results could stand on their own and could be used for different programs.

Bill Ray provided the following comment by email on 8/22/18

The problem with the linear model and why you are using arbitrary factors is because one of the errors, the counting error, is not linear but inversely proportional. That is because labs use fixed count times instead of varying count times to collect sufficient counts to achieve a particular error rate. So, the smaller the concentration, the larger the ratio of the count error to the activity. Note for gross alpha measurements in DW that labs will report a count error of 100% (3+/-3) and that ratio gets smaller as the activity increases.

Other issues include the differences in number of error sources between methods. Gamma Spec. has almost no prep steps while Sr90 has a boat load (sample volume, chemistry with carriers, ingrowth, decay, and the mechanics of the whole process).

Discussion:
This is addressed in Keith's model.

PTs are single blind. Would it make sense to treat them more like Matrix Spikes (MS) rather than as an LCS? Keith can look at whether the limits for MSs would be greater. Vas believes it is greater than 10%. It could be 20% or more. Keith noted this could be considered where limits need to be widened?

Email 8/21/18: Keith's Approach and Comments

My first inclination was to model the required variance σ^2 (or SD^2) as the sum of three components:

$$\sigma^2 = a \times AV^2 + b \times AV + c$$

The first component accounts for calibration errors, aliquot errors, yield errors, and any other errors that are propor- tional to the assigned value (AV). The second component accounts for the uncertainty of the counts produced by the sample. The third component accounts for the uncertainty, including counting uncertainty, of the background correction

Of course, σ then equals the square root of σ^2.

For a real measurement process, that's generally a better model than the linear model. Unfortunately, it seems impractical to get enough information to estimate all three parameters, *a*, *b*, and *c*. I considered whether we could use a two-parameter model, either

$$\sigma^2 = a \times AV^2 + c \text{ or } \sigma^2 = a \times AV^2 + b \times AV$$

The second of these has the disadvantage that it makes σ go to zero as AV goes to zero; the first one does not. Other than that, it would be an arbitrary choice between the two, which I wasn't comfortable with. They produce very different results when you plot the curves.

When I compared these two models for σ, fitting the curves to two data points, as described in the proposal, I saw that one produced a curve that was convex (cupped upward), and one produced a curve that was concave (cupped downward). The linear model splits the difference and produces a straight line through the same two data points. The linear model also has the advantage that it has been used frequently and doesn't require us to prove to anyone that it works. TNI's current model for drinking water PT samples is linear.

I actually did not spend much time considering the third possible 2-parameter model for σ^2: $\sigma^2 = b \times AV + c$

although I could have. I knew it had the disadvantage that as AV increases toward infinity, the relative standard deviation becomes arbitrarily small. This is the only one of the models that would fully account for counting uncertainty and nothing else. For me, that's a reason not to use it.

It is important to remember that σ is a required standard deviation, not an actual standard deviation. For any real measurement process, we would *not* expect σ to follow a linear model. For a multitude of measurement processes at many labs, we really have no idea what the curve should look like. The linear model seems as good as any and probably better than either of the other 2-parameter models that I considered. - Keith

Bob asked Brian if he had any comments. Brian commented that previous criteria was passed on 2 standard deviations and his company based it off of 1 standard deviation. If things switch to Keith's suggestions, they would run off of 1 standard deviation off his calculation instead. He would want to see more data on the gamma emitters.

Keith and Bob will meet with EPA (Glenda) next week and then they will put the information together to send it to the Chemistry FoPT Subcommittee. Bob will present his concerns with the historical approach and then present Keiths info.

Ilona commented that the Chemistry FoPT Subcommittee would want to see the results compared between using the current approach verses the recommended new approach.

Keith will work on examples of both using the same data – since some of the data was unusable and removed.

(ADDITION: Bob sent the recommendation to Carl Kircher on 9/5/18 – See Attachment F.)

4. Notice of Intent.

Bob got started on the documentation to start updating the Standard. The committee should review it for discussion at the next meeting. The ISO/IEC 17025:2017 update will have little effect on Module 6.

NOTICE OF INTENT TO ESTABLISH OR MODIFY A TNI STANDARD

Expert Committee or group requesting the establishment or change to the Standard	Radiochemistry Expert Committee	**Proposal Date**	8/22/18	**CSDEC Approval**	

TNI Volume	**Module**	**Sections(s)**
ELV1	6	All sections

Nature of the standard to be established or the change to the existing standard proposed:

Pursuant to the NELAC Institute's SOP2-100 on consensus standard development, notice is hereby given that the Radiochemistry Expert Committee (REC) seeks to review and update Module 2 of the Environmental Laboratory Standard. Any person objecting and believing there is not a compelling need for the proposed modifications should contact the NELAC Institute Consensus Standards Development Program Administrator, ken.jackson@nelac-institute.org,

Justification or need for the standard or the change in the standard:

Module 6 will be updated to clarify a minor issues identified by the committee since the 2016 revision of the standard.

How is the proposal an improvement over the existing standard:

The Radiochemistry Expert Committee will revise and clarify existing items in the standard. This is not an exhaustive list of potential changes.

Any potential conflicts developed upon development of the standard or the proposed change to the standard?	None known
Any potential obstacles to implementation by ABs?	None known

Signature of proposal representative - Bob Shannon - Chair	**Date**

5. Training in New Orleans

   Ilona commented that the completed surveys all had favorable comments on the class. People especially liked the data package reviews again. We found that even though the class was extended to 5pm instead of 3:30, many people still had to leave for travel. Ilona suggested thinking about pre-recording part of the class as an assignment for people before they show up in Milwaukee. This might allow the class to cover all the information and run until 3 or 3:30pm at the latest.

6. Standard Revision

   Bob reminded everyone to keep sending items for consideration for the revision of the Standard. The committee has not started this effort yet, but Bob has been keeping track of suggestions being made for the next update (Attachment D).

7. New Business

   None

8. Action Items

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

9. Next Meeting and Close

   Next meeting will be September 26, 2018 by teleconference.

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

   The meeting was adjourned at 2:05 pm Eastern.

Attachment A
Participants
Radiochemistry Expert Committee

Members	Affiliation		Contact Information
Bob Shannon (Chair) (2019) **Present**	QRS, LLC Grand Marais, MN	Other	BobShannon@boreal.org
Tom Semkow (Vice Chair) (2019) **Present**	Wadsworth Center, NY State DOH Albany, NY	AB	thomas.semkow@health.ny.gov
Sreenivas (Vas) Komanduri (2019) **Present**	State of NJ Department of Environmental Protection Trenton, NJ	AB	Sreenivas.Komanduri@dep.state.nj.us
Marty Johnson (2019) **Present**	US Army Aviation and Missile Command Nuclear Counting Redstone Arsenal, AL	Lab	Mjohnson@tSC-tn.com
Velinda Herbert (2021*) **Present**	National Analytical Environmental Laboratory	Lab	Herbert.velinda@epa.gov
Brian Miller (2021*) **Present**	ERA	Other	bmiller@eraqc.com
Terry Romanko (2021*) **Present**	TestAmerica Laboratories, Inc.	Lab	Terry.romanko@testamericainc.com
Ron Houck (2018*) **Absent**	PA DEP/Bureau of Laboratories	AB	rhouck@pa.gov
Yoon Cha (2020) **Absent**	Eurofins Eaton Analytical	Lab	YoonCha@eurofinsUS.com
Candy Friday (2020) **Absent**	CdFriday Environmental, Inc.	Lab	candy@fridayllc.com
Ilona Taunton (Program Administrator) **Present**	The NELAC Institute	n/a	Ilona.taunton@nelac-institute.org

Attachment B

Action Items – REC

	Action Item	Who	Target Completion	Completed
90	Send note about method codes and concerns to the PT Expert Committee. Is there a way to limit the codes a lab can use to report PT data?	Bob	TBD	
91	Compile information about new PT Limit Process and discuss with EPA and send to the Chemistry FoPT Subcommittee Chair – Carl Kircher.	Bob and Keith	9/25/18	
92				
93				

Attachment C – Back Burner / Reminders

	Item	Meeting Reference	Comments
5	Form subcommittee of experts in MS and other atom counting techniques to see that these techniques are adequately addressed in the radiochemistry module.	9/24/14	
6	From Action Item # 75: Prepare copy of Standard annotated with summary document language.		This is a project Carolyn was working on, but the committee decided it may duplicate the Small Lab Handbook. This project has been put on Hold.

Attachment D. Summary of Recommended Changes to the 2016 Standard

Suggestions for Changes, Clarifications, and Improvements to 2016 V1M6 – Radiochemistry

1. Tom
   a. Section 1.7.1.5.c.ii)
      i. Physical impossibility of measurement of Lucas Cell background per day of use after it has been filled with radon.
   b. Sections 1.6.2.2.b) and 1.7.2.3.e.iii)
      i. Three gamma energy ranges for DOC and two ranges for LCS are specified. Since LCSs are often used for DOC, it is inconsistent.
   c. Section 1.7.1.4.a.iii)
      i. No guidance is provided what to do if the instrument performance check source is compromised.
   d. Sections 1.7.3.5.b) and 1.7.3.5.f)
      i. Contradiction and a lack of logic in saying that "shall be reported directly as obtained" and then that specific requirements can take precedence over "shall". Then it should not be "shall".
   e. Question: why does Module 6 have only one Section 1.0?
   f. Page 3, Uncertainty, Counting
      Change "…often estimated as the square root…" to "…often estimated as Standard Uncertainty by means of the square root…"
   g. Page 3, Section 1.3.2, 1-st paragraph
      Change "(e.g., calibrations,…)" to "(see Section 1.2)"
   h. Page 4, Section 1.5.1.g NOTE
      Change "The use…" to "For TNI accreditation, the use…"
   i. Page 5, Section 1.5.2.1
      Change "Minimal" to "Minimum"
   j. Page 6, Section 1.5.4.c
      The Section is out of alignment.
   k. Page 6, Section 1.5.4.c.i
      Change "If the experimentally-observed standard deviation at each testing level statistically exceeds the Standard Uncertainty, then the uncertainty estimate should be re-evaluated." to "If the experimentally-observed standard deviation from the precision evaluation statistically exceeds the Standard Uncertainty evaluation at each testing level, then the uncertainty estimate should be re-evaluated."
      Or even better to "Otherwise, the uncertainty estimate should be re-evaluated."
   l. Page 7, Section 1.5.4.c.ii
      Note, however, that the new EPA procedure in EPA 815-B-17-003 requires a chi-square test at DL, which is a kind of precision evaluation.
   m. Page 7, Section 1.5.5.b
      The font for "b)" is too large.

n. Page 9, Section 1.6.3.2.c
   Change "…each with activity consistent method…" to "…each containing activity consistent with method…"
o. Page 10, Section 1.7.1.2.a.i
   Change "following" to "after"
p. Page 16, Section 1.7.1.6.e
   Perhaps for gas proportional detectors also?
q. Page 17, Section 1.7.1.7
   Change "1.7.2.3" to "1.7.2.2"
r. Page 19, Section 1.7.2.3.d
   Change "Decision Level (Critical Value)" to "MDA"
   There are problems, in my opinion with the whole sentence "When practical…". It leaves the reader wondering what should be the spiking level when sample activities are less than 10 times the Decision Level. In addition, the action levels by some agencies are [unreasonably] high, which would imply high LCS, which is not practical.
s. Page 19, Section 1.7.2.3.e
   Change "The final…" to "The final prepared LCS needs to have the activity and its uncertainty known, however, it need not be strictly traceable to a national standard organization."
t. Page 20, Section 1.7.2.3.g; Page 24, Section 1.7.3.1.b; Page 24, Section 1.7.3.2.b; Page 24, Section 1.7.3.3.a.ii; Page 25, Section 1.7.3.3.b.iii
   Delete "above"
u. Page 20, Section 1.7.2.4.a.iii
   Change "1.7.2.3.e and 1.7.2.3.7.f" to "…d and …e"
v. Page 21, Section 1.7.2.4.a.viii
   Change "The final…" to "The final prepared MS needs to have the activity and its uncertainty known, however, it need not be strictly traceable to a national standard organization."
w. Page 22, Section 1.7.2.6.c.i
   Insert a comma after "e.g."
x. Page 25, Section 1.7.3.5.b
   More on reporting as is, even if negative. In addition to my questioning this as a requirement, there are practical problems. It is easy to calculate for paired counting. Gamma spectrometry has a complicated series of criteria which determine if the radionuclide is identified. For Canberra software these include peak sensitivity: it cannot be lowered below the minimum value; critical level test: the user can disable it; peak tolerance in keV; and nuclide identification threshold. The NID threshold involves self-absorption in the sample, presence of corroborating peak (e.g., in Co-60), decay correction, and other factors. Even if set low, the nuclide may not be detected.
y. . Are there any auditable requirements for items such as:
   i. the sample has to be analyzed as a whole
   ii. only a single measurement is required
   iii. no repeated measurements are allowed
   iv. aliquoting is allowed or not allowed
   v. sample can/cannot be split into sub-samples analyzed separately

2. Vas
   a. Consider whether existing issues would benefit from being addressed as SIRs
3. Keith

a. 1.7.2.3(d)
    i. It makes a lot more sense to talk about activities x times the MDC than x times the critical level. The critical level isn't really a well-defined measurable quantity. As we ordinarily define and use it, it's just a statistic that can vary with each measurement. The MDC is the a priori concept, whose value we can estimate.
    When we calculate the a priori MDC, we actually do calculate an a priori critical value, too, but that value is never recorded or used for anything else.

4. Bob
    a. Explicitly clarify that QC data can by used as performance data for validation
    b. The original intent to the introductory language in each section was to frame the requirements that follow - not to establish requirements. The original intent was to number all requirements to facilitate writing findings. Review all sections. Add any clarifying language needed to intro and move requirements to numbered sections.
    c. Consider removing DOC requirements that are already addressed in Module 2. Include only the differences specific to radchem.
    d. 1.7.1.2 a) ii., iii., and iv. all describe the same situation – instrument response has changed. Would it not be good enough to put these together or even just to leave it be with iv.?
    e. Consider updating requirements for RMBs – it may be appropriate to explicitly state that blanks should be set up along with samples - samples are handled and could become contaminated.
    f. Consider updating requirements for standards. ISO requirements for standards are vague and make no distinction in requirements for reference materials used for calibration and QC/PT standards. One might consider uncertainty as a criterion although how does one evaluate the uncertainty of the material.
    Right now, ISO providers are not required to intercompare . One might say that study performance will show problems (i.e., compare grand mean to true values) but that is putting the cart is before the horse. Round robin/consensus studies with labs of untested capability provide little in the way of confidence. Many people feel that the approach in ANSI N42.22, which requires providers to participate in a Measurements Assurance Program (MAP) where the RM provider intercompares with an NMI, is the minimum that should be requires for calibration.
5. Define independent source – what is there is only one source - can procure two sources and handle differently.
6. Section 1.5.4 sets out requirements for reporting uncertainty. Is this just for the validation or for all results?
7. Add more sample specific QC criteria – FWHM, Quench or mass within range, etc.
8. In training session, someone brought up the issue of deleting points from calibration curves. Should we add something to the extent of saying that any measured data needs to be used unless there is a known and clearly documented reason why it is invalid, or why its deletion is not targeted at "cooking" the data?

Attachment E: PDFs

Update on the Proposed PT Acceptance Criteria, 2018-08-22

Our original goals were:

- To eliminate the bias from the acceptance limits, which has created perverse incentives for participants to maintain biased measurement processes
- To base acceptance limits on MQOs, not the historical (biased) performance of participants
- To develop an approach that can be applied to other matrices and programs

To eliminate the bias from the acceptance limits, all we have to do is make the midpoint of the acceptance range equal to the assigned value, not some function of the assigned value (AV).

We can still calculate the required standard deviation (SD) as a linear function of the assigned value, with acceptance limits at the midpoint ±2SD.

$$SD = c \times AV + d$$

To determine the two parameters (c and d) of this linear equation, we need uncertainty requirements at low and high activities.

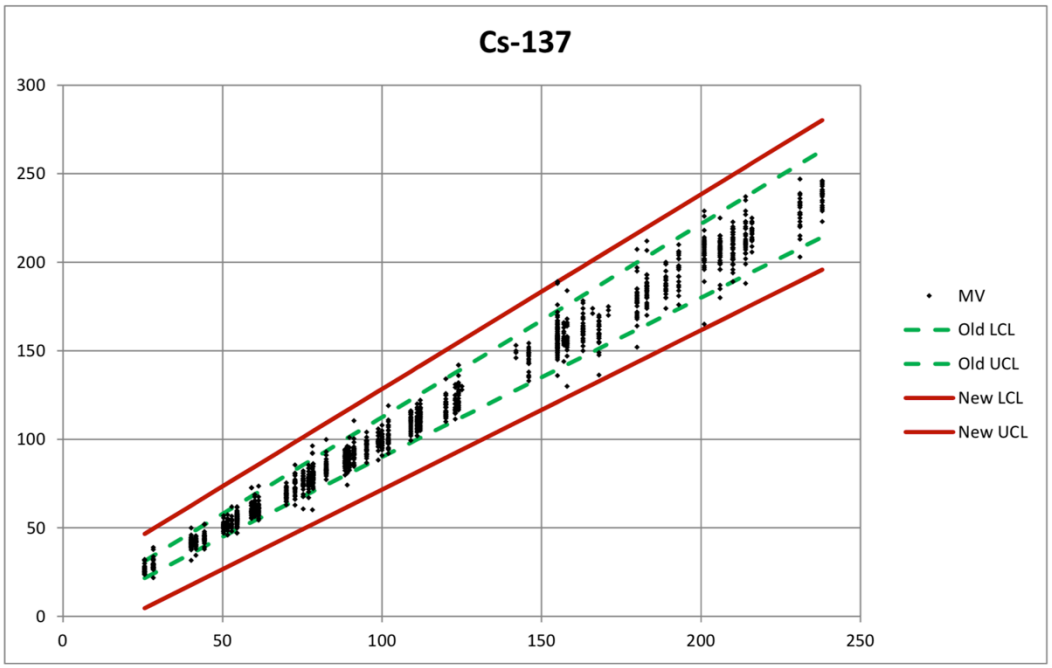
For the drinking water program, the requirement at low activity is determined by the "detection limit" DL, where the relative standard uncertainty is required by regulation to be no more than 1/1.96. There isn't much doubt about this MQO. But at high activity, we have options, none of which is really ideal.

Our original proposal was to take the control limits for laboratory fortified blanks (LFBs) recommended in the DW certification manual and apply those limits at the upper end of the PT testing range. In a few cases, straightforward application of this rule produced unrealistic equations with very small values for c, including a couple of cases with $c < 0$; so, I set an arbitrary minimum positive value of 0.02 for c.

When I applied the modified criteria to historical data, I found that we got a lot of failures for some analytes. It seemed that $c = 0.02$ was still too small. The results looked more reasonable with $c = 0.05$, but instead of choosing a new arbitrary minimum value of 0.05, what I've done is just to set c equal to half the LFB tolerance in the certification manual, which automatically means it is never less than 0.05, since all the LFB tolerances are at least ±10 %. It actually ranges from 0.05 to 0.15.

When $c = 0.05$, the required *relative* standard deviation converges asymptotically to 5 % as the assigned value becomes very large, but it is still greater than 5 % at the upper end of the testing range.

The following PDFs were sent with the message above:


Cs-137
300
250
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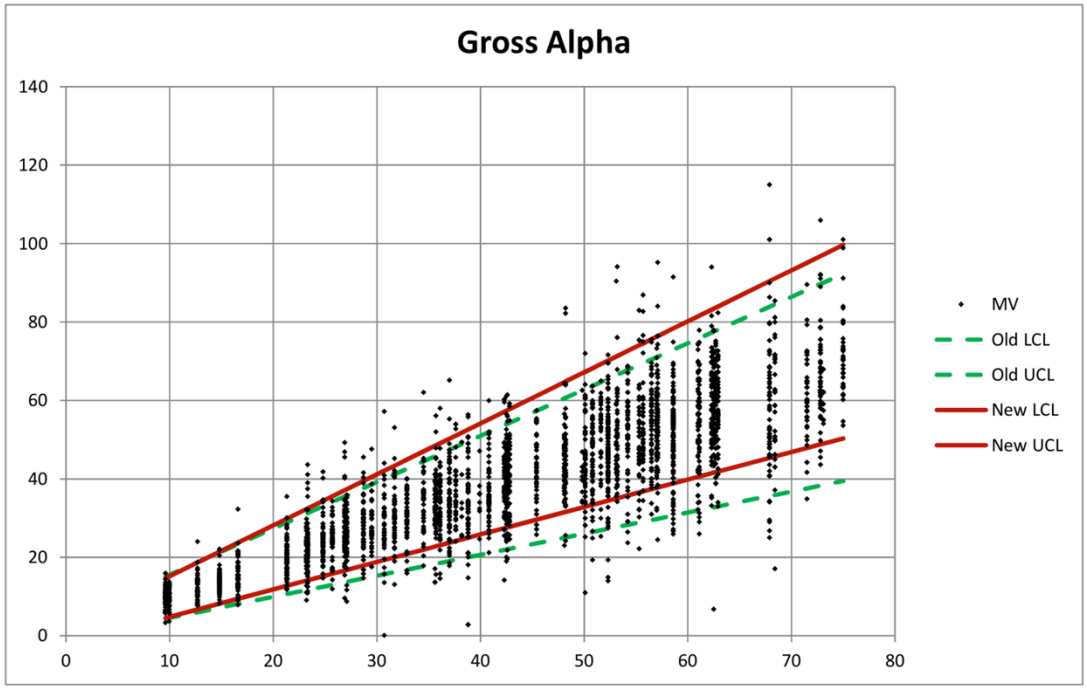
MV
Old LCL
Old UCL
New LCL
New UCL


Gross Alpha
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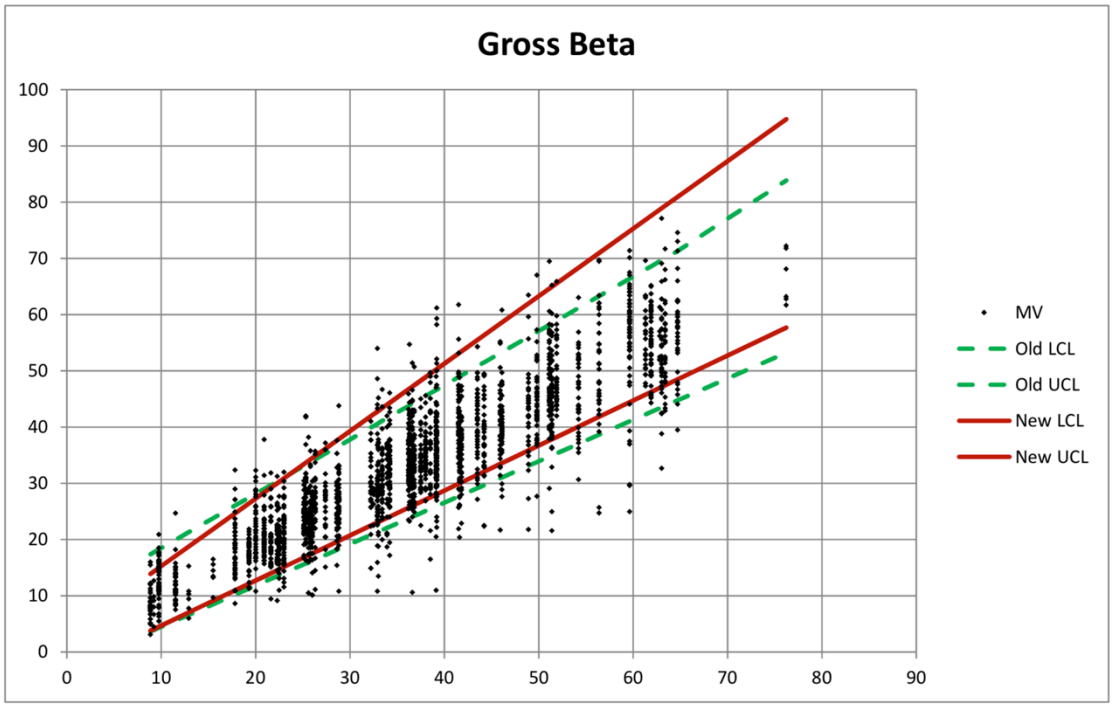
Old UCL
New LCL
New UCL


Gross Beta
100
90
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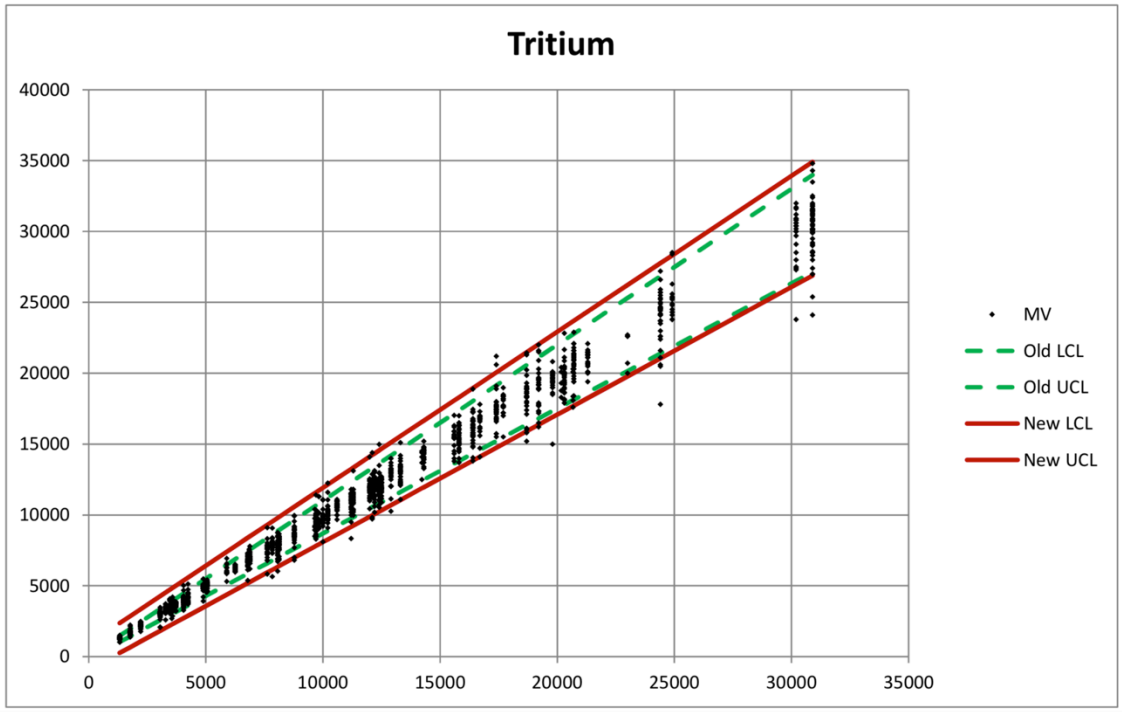
Tritium
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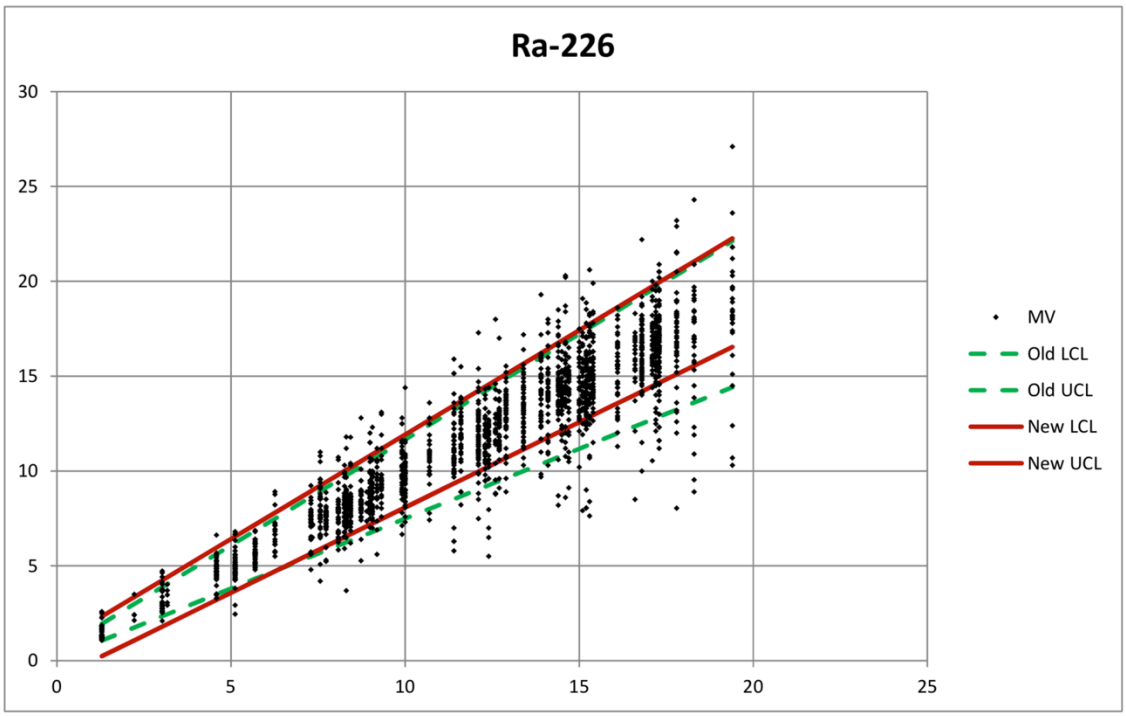
Ra-226
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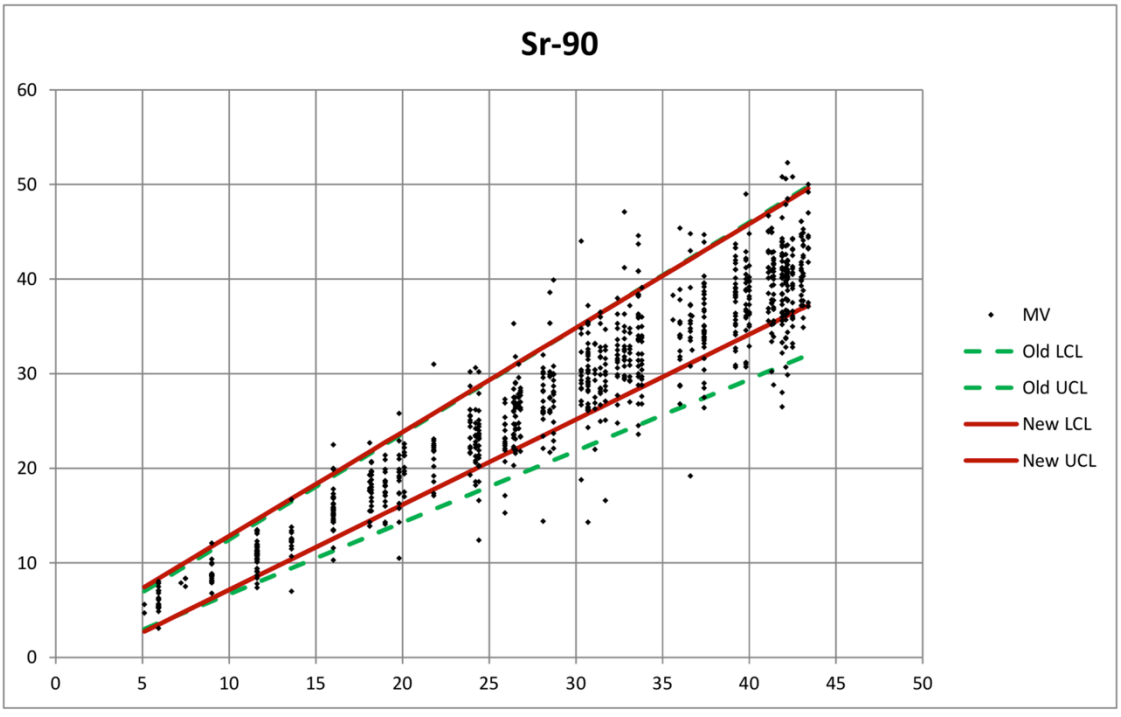
New UCL


Sr-90
60
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10
15
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25
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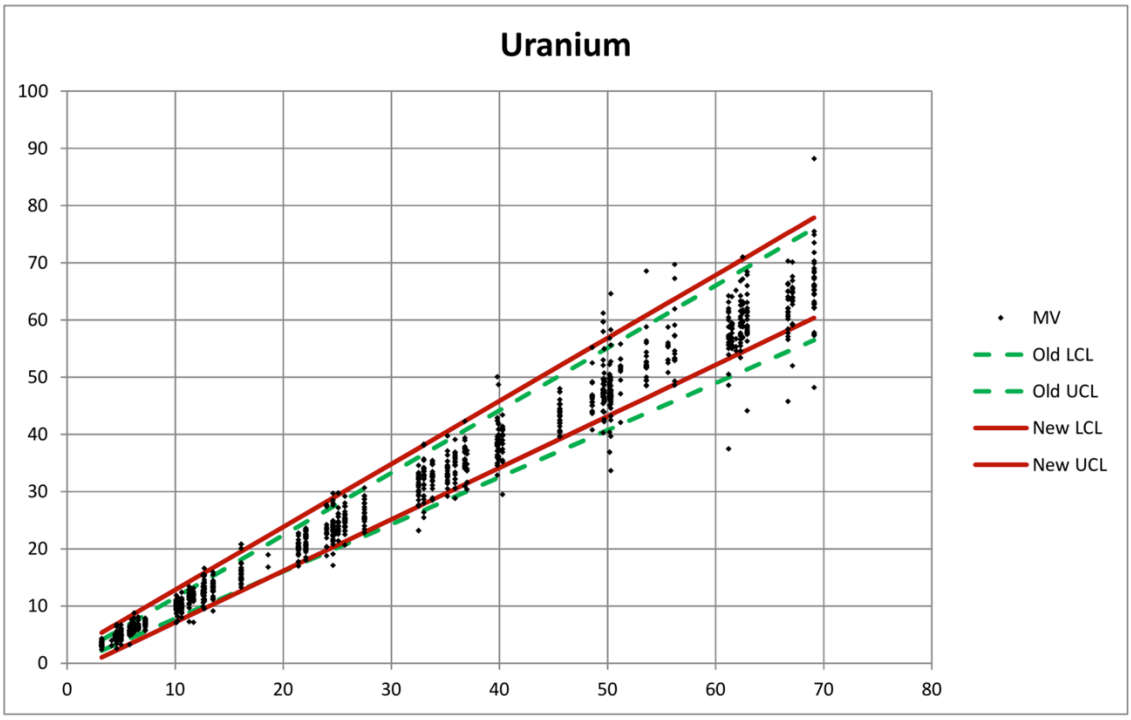
35
40
45
50
MV
Old LCL
Old UCL
New LCL
New UCL


Uranium
100
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(Addition: ***Attachment F: E-mail to Carl Kircher (Chair, Chemistry FoPT Subcommittee) with PT Information for Consideration – 9/5/18***

Carl –

I apologize that this has taken so long. There was *a lot of work* involved in looking at the dataset we received. It was a fruitful exercise, however and I think we are at a point where we are ready to talk to the subcommittee again. Let me quickly summarize where we are at.

As I went through the dataset, it became apparent that the connection between TNI method codes, SDWA approved methods, and reported results is weak. Labs are asked to report the method used (freehand entry); there is no uniformity in method naming and frankly no way to know if the reported method was run in compliance with the reported method. Entries were encountered that included approved methods (both unambiguously and ambiguously identified), modified methods, laboratory SOPs, methods that could not possibly be used to determine the reported analytes, no method identified, and even data that were obviously experimental (i.e., labs working on developing new methods) or may have nothing to do with drinking water. Given the status quo, I tried to be generous in identifying method references and associating those with TNI method codes. Still, I ended up having to exclude over 5,000 of the ~27,000 data points. Had I required strict or unambiguous references, *many, many more* would have been rejected. A second large concern is that TNI method codes are not always consistently or logically assigned. For example, redundant codes are used for gamma emitting radionuclides, and I have concerns about how uranium and radium methods are grouped. For examples, please see the attached Excel file 1 Methods vs Method code. *(refer to Agenda email sent by Bob on 8/21/18).*

In the end, I would conclude that there is inadequate control over the PT result dataset for it to be reliably used as the statistical basis for deriving PT sample acceptance criteria. Additionally, methods for all water matrices are bundled (e.g., SDWA and CWA) and there are no method codes for other matrices, even though the TNI Standard allows laboratories to be accredited to non-drinking-water matrices. These are problematic situations that should be addressed by the committee.

We previously expressed concern that using reported PT results as a statistical basis for establishing acceptance criteria institutionalizes bias and can, in some cases, lead to arbitrarily wide acceptance criteria. Such criteria reward labs for delivering biased results and can even penalize labs that do not. The arbitrary limits raise concerns that TNI PT acceptance criteria do not ensure that data satisfying acceptance criteria can provide any assurance that data quality is adequate to support program decision making.

For this reason, we are proposing an alternate approach that ties acceptance criteria, not to reported results, but to program-defined measurement quality objectives (MQOs). This approach is briefly described in the attached Word document entitled 2 PT criteria-Update *(see Attachment E in minutes)*. We have applied these criteria to the (partially) sanitized dataset discussed above. Attached graphs (attached PDF files labelled 2a – 2g) show old vs. new acceptance criteria *(see Attachment E in Minutes)*.

For now, I would suggest only focusing on updating the SDWA criteria. Down the road, this approach is flexible enough that it can be used to establish acceptance criteria for programs beyond drinking water, and even, case-by-case, for laboratory-developed or for laboratory-modified methods using MQOs supplied by the laboratory.

We would like to present this to the subcommittee for discussion and determination of a path forward. Please let us know when we can do this. Please do note that Keith will be on vacation the week of September 17.

Thanks!

Bob Shannon and Keith McCroan